

A COMPLETE BOOK OF DATA INTERPRETATION & ANALYSIS

Useful for Banking & Insurance Examinations
like SBI, IBPS, RBI, LIC, ESIC & Others

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Latest Edition Includes

- Concept with Detailed Approach
- Basic to Advance Level Questions with Detailed Solutions
- **All Types of DI:** Table, Pie, Bar, Line, Caselet, Radar, Mixed DI with Special Focus on Arithmetic DI and Missing DI
- Last 6 Years' Memory Based Questions (Pre & Mains)

3200+
Questions with
100%
Solutions

Chapter 01

Introduction to Data Interpretation

Data: A series of observations, measurements or facts associated with any event (Physical, Social or Economic). Data can be in the form of figures or statements.

Data interpretation: Act of organizing and interpreting data to get meaningful information.

In Data interpretation, a large volume of data is organized and is represented into a compact and precise form which is easier to interpret than the raw data. Students are required to draw conclusions and inferences from a comprehensive data presented numerically in these organized forms by means of a table or a graphical image (Graphs, Pie-Chart etc.). It tests speed as well as understanding, analytical and decision making capabilities of the students.

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Basic tools to solve Data Interpretation:

- Calculation
- Percentage
- Ratio
- Average

Solved Examples

- Calculation:** Below are some essential tools which help in faster calculations. Students must learn these by heart as much as they can:
 - Tables
 - Squares and Cubes
 - Square roots & cube root
 - Reciprocal Values
- Percentage:** Percentage means every hundred. It is a ratio with base of 100. Percentage calculation is the most important aspect in the representation as well as in the interpretation of the data. Students must know about various basic properties of percentage and tricks involved in the faster calculation of percentages.

Some important formula:

$$\text{Percentage Increase} = \frac{\text{Final Value} - \text{Initial Value}}{\text{Initial Value}} \times 100$$

$$\text{Percentage Decrease} = \frac{\text{Initial Value} - \text{Final Value}}{\text{Initial Value}} \times 100$$

$$\text{Quantity I is how much percent of Quantity II} = \frac{\text{Quantity I}}{\text{Quantity II}} \times 100$$

$$\text{Quantity I is how much percent more than Quantity II} = \frac{\text{Quantity I} - \text{Quantity II}}{\text{Quantity II}} \times 100$$

$$\text{Quantity I is how much percent less than Quantity II} = \frac{\text{Quantity II} - \text{Quantity I}}{\text{Quantity II}} \times 100$$

Students must learn by heart the fractional values of some important frequently used percentages:

$5\% = \frac{1}{20}$	$10\% = \frac{1}{10}$	$20\% = \frac{1}{5}$
$40\% = \frac{2}{5}$	$50\% = \frac{1}{2}$	$60\% = \frac{3}{5}$
$75\% = \frac{3}{4}$	$80\% = \frac{4}{5}$	$120\% = \frac{6}{5}$
$125\% = \frac{5}{4}$	$150\% = \frac{3}{2}$	

Fractional values of some important frequently used fractional percentages:

$33\frac{1}{3}\% = \frac{1}{3}$	$16\frac{2}{3}\% = \frac{1}{6}$	$11\frac{1}{9}\% = \frac{1}{9}$
$14\frac{2}{7}\% = \frac{1}{7}$	$7\frac{1}{7}\% = \frac{1}{14}$	
$12\frac{1}{2}\% = \frac{1}{8}$	$6\frac{1}{4}\% = \frac{1}{16}$	
$9\frac{1}{11}\% = \frac{1}{11}$	$8\frac{1}{3}\% = \frac{1}{12}$	$6\frac{2}{3}\% = \frac{1}{15}$

Students can also learn some other percentages based on the above tables:

For example:

$$\frac{1}{20} = 5\%$$

$$\therefore 15\% = 3 \times 5\% = 3 \times \frac{1}{20} = \frac{3}{20} \Rightarrow \frac{1}{3} = 33\frac{1}{3}\%$$

$$\therefore 66\frac{1}{2}\% = 2 \times 33\frac{1}{3}\% = 2 \times \frac{1}{3} = \frac{2}{3} \Rightarrow \frac{1}{8} = 12\frac{1}{2}\%$$

$$\therefore 37\frac{1}{2}\% = 3 \times 12\frac{1}{2}\% = 3 \times \frac{1}{8} = \frac{3}{8}$$

Note: If the percentage value is increased by 100%, then the equivalent fraction value will also be increased by 1.

For example:

$$25\% = \frac{1}{4}$$

$$\therefore 125\% = 1 + \frac{1}{4} = \frac{5}{4} \Rightarrow 33\frac{1}{3}\% = \frac{1}{3}$$

$$\therefore 133\frac{1}{3}\% = 1 + \frac{1}{3} = \frac{4}{3} \Rightarrow 8\frac{1}{3}\% = \frac{1}{12}$$

$$\therefore 108\frac{1}{3}\% = 1 + \frac{1}{12} = \frac{13}{12}$$

Must know: If any quantity doubles itself then it is 200% of its previous value.

If any quantity triples itself then it is 300% of its previous value.

If any quantity becomes 5 times of itself then it is 500% of its previous value.

But

If any quantity doubles itself then it is increased by 100%.

If any quantity triples itself then it is increased by 200%.

If any quantity becomes 5 times of itself then it is increased by 400%.

Note: Always break the single percentage into easier percentages wherever possible.

For example:

$$65\% = 50\% + 10\% + 5\% \Rightarrow 45\% = 50\% - 5\%$$

$$95\% = 100\% - 5\% \Rightarrow 87\frac{1}{2}\% = 100\% - 12\frac{1}{2}\%$$

$$43\frac{1}{3}\% = 50\% - 6\frac{2}{3}\%$$

- 3. Ratio:** It is defined as the reduced form of values of quantities to lowest integers for the purpose of comparison between the values of quantities. It is the result of value of one quantity divided by another. Ratios can be expressed as fractions, decimals or even as percentages. It is necessary that the two figures compared should have the same characteristics and should be expressed either in same unit or in comparable units. For the calculation of ratios, students must learn tables, divisibility of numbers and simplification of expressions etc.

$$\text{Ratio} = \frac{\text{Quantity I}}{\text{Quantity II}}$$

- 4. Average:** It is defined as the central value of values of all the quantities taken into consideration. It is the result of sum of values of all the quantities divided by the number of quantities. Average is always between the highest and the lowest values among the values of all the quantities. It is necessary that the quantities taken in consideration should have the same characteristics and should be expressed either in same unit or in comparable units. For the calculation of averages, students must learn the various properties related to average.

$$\text{Average} = \frac{\text{Sum of values of all quantities}}{\text{Number of quantities}}$$

Important Points to Remember:

- 1. Read the question carefully:** The first and the most important step in solving any Data Interpretation question is to read the question carefully. You should read all the data that comes with the graphs or table in the question. Many a times, the data given above/below the graph (additional instructions) turn out to be more important than most of the numbers in the graphs.
- 2. Analyze the data carefully:** The next step is to analyze the given graph/data carefully. Do not try to see the questions first and find out the answers accordingly. You will waste your time following that method. Try to understand the graph. Look at the type of data given in each graph, chart, table or pie chart. Look carefully at the labels.
- 3. Don't worry about too much data:** Try to understand the question. Sometimes, the question contains lots of data that is unrelated and is not required for answering the questions. When you look at the question you may get discouraged by the lengthy tables or by the amount of information given above/below the graphs. But, if you try to understand what the data is about and then look at the question, you may find that you only have to use part of the data. Hence, it is important that you do not get disheartened by the size of the data and skip the question without looking closely at it.

4. **Learn to skim through data:** Some graphs have a lot of data associated with them and not all of which is required to solve the questions. Skimming through the data and avoiding mess is an important part of the process. So, just focus on what is required in the question, rather than on all the data at one time.
5. **Avoid unnecessary calculations:** We have a habit from our school days to solve questions in a step by step method. This is a very good habit for school exams but a really bad habit when it comes to the competitive exams. There are many unnecessary calculations that we do while attempting the questions which cost us a precious few seconds per question. Sometimes, there are many steps that can be skipped but we still do it as we are trained to solve in a step by step method. Learn to skip those steps.
6. **Learn to approximate:** You do not need to calculate the exact answer for every question. Many a times, the options given are far enough from each other to give you enough room for approximation. So, instead of finding the accurate answer, try to find an approximate answer. This will give you the correct answer more often than not. If however, the options are close, you will still be able to eliminate 1 or 2 options easily.
7. **Pay close attention to the units used:** Sometimes, the questions may use a different unit for the question and another unit for the data. If you do not pay close attention to the unit, you may be ended up choosing the wrong answer. Always convert the units into the ones which are asked in the question.
8. **Skip questions that need too much calculation:** Some questions ask too much from you. They require lots of calculation in order to be solved. These questions are known as the speed-breakers. Such questions are best left alone, at least in the first round of attempt. Once you have finished solving all the easy questions and still have time left for the section, you should attempt these questions. If you try such questions, you will lose your precious time on them and may not be able to attempt some simple questions that may follow.
9. **Don't assume anything:** Sometimes there are questions which need to find out some data which cannot be calculated even with the help of the data given in the graph and the question. Always be alert enough to see whether the data given is enough to answer the question or not and do not go forward with answering the questions based on assumptions. Sometimes, 'cannot be determined' can also be the correct answer.

Classification: Data interpretation is broadly classified as follow:

- | | | |
|---------------|----------------|----------------|
| 1. Table | 4. Pie Chart | 7. Caselet |
| 2. Line Graph | 5. Radar Graph | 8. Arithmetic |
| 3. Bar Graph | 6. Mixed Graph | 9. New pattern |

Table : It is the most fundamental and the most versatile way of representing data and an easier format to comprehend. Data is arranged in columns and rows in a table in either alphabetic or chronologic order (as A, B, C or month wise, year wise). Either the columns or the rows will represent different values to describe the variables. Other different kind of data representation formats like bar graph, line graph, pie chart etc., originate from the table. In other words, representing the data in a tabular format is the first step in forming other types of data representation formats.

Format of Table DI

Column 1	Column 2	Column 3	Column 4	
				Row 1
				Row 2
				Row 3
				Row 4
				Row 5

Table DI can be classified into following categories.

- (i) Basic Table DI
- (ii) Missing Table DI

(i) Basic Table DI: Basic table DI are very common in competitive exams. In Basic table DI no data is missing and all data is provided in columns and rows in a table in either alphabetic or chronologic order. Either the columns or the rows will represent different values to describe the variables.

Example:

Directions (1-8): Following table shows the percentage of population below poverty line out of the total population of a particular state for six states and the ratios of male and female below and above poverty line in these states:

State	Percentage population below poverty line	Proportion of male and female	
		Below poverty line M : F	Above poverty line M : F
A	16	5 : 3	4 : 3
B	10	3 : 7	5 : 4
C	22	6 : 5	7 : 6
D	28	3 : 4	5 : 7
E	12	1 : 3	6 : 5
F	20	2 : 3	3 : 5

Types of question asked:

1. Find the population of males above poverty line in state C if the total population of the state is 60 lakh.

Sol.: Percentage of population above poverty line in state C = $100 - 22 = 78\%$

Percentage of males above poverty line in state C out of total population = $\frac{7}{13} \times 78 = 42\%$

Population of males above poverty line in state C = 42% of 60 lakh = 25.2 lakh

2. Find the difference of population of males below poverty line and females above poverty line in state A if the total population of the state is 35 lakh.

Sol.: Percentage of males below poverty line in state A out of total population = $\frac{5}{8} \times 16 = 10\%$

Percentage of population above poverty line in state A = $100 - 16 = 84\%$

Percentage of females above poverty line in state A out of total population = $\frac{3}{7} \times 84 = 36\%$

Required Difference = $(36\% - 10\%)$ of 35 lakh = 26% of 35 lakh = 9.1 lakh

3. If the population of males above poverty line in state D is 13.5 lakh then find the total population of the state.

Sol.: Percentage of population above poverty line in state D = $100 - 28 = 72\%$

Percentage of males above poverty line in state D out of total population = $\frac{5}{12} \times 72 = 30\%$

Population of males above poverty line in state D = 30% of total population = 13.5 lakh

Total population = $\frac{100}{30} \times 13.5 = 45$ lakh

4. Find the ratio of population of females below poverty line and males above poverty line in state F.

Sol.: Percentage of females below poverty line in state F out of total population = $\frac{3}{5} \times 20 = 12\%$

Percentage of population above poverty line in state F = $100 - 20 = 80\%$

Percentage of males above poverty line in state F out of total population = $\frac{3}{8} \times 80 = 30\%$

Required Ratio = 12% of total population : 30% of total population = $2 : 5$

5. Find the ratio of population of males below poverty line in state C and females above poverty line in state D if the ratio of total populations of state C and D is $7 : 4$.

Sol.: Let the total populations of state C and D be $7x$ and $4x$ respectively.

Percentage of males below poverty line in state C out of total population = $\frac{6}{11} \times 22 = 12\%$

Percentage of population above poverty line in state D = $100 - 28 = 72\%$

Percentage of females above poverty line in state D out of total population = $\frac{7}{12} \times 72 = 42\%$

Required Ratio = 12% of total population of state C : 42% of total population of state D

= 12% of $7x$: 42% of $4x$ = $1 : 2$

6. Find the difference of population of males below poverty line in state C and females above poverty line in state D if the ratio of total populations of state C and D is $7 : 4$.

Sol.: The difference of populations cannot be determined because only the ratio of the populations of states is given, not the actual populations.

7. Population of females below poverty line in state B is how much percent of males above poverty line in state F if the ratio of total populations of state B and F is 6 : 7?

Sol.: Let the total populations of state B and F be $6x$ and $7x$ respectively.

$$\text{Percentage of females below poverty line in state B out of total population} = \frac{7}{10} \times 10 = 7\%$$

$$\text{Percentage of population above poverty line in state F} = 100 - 20 = 80\%$$

$$\text{Percentage of males above poverty line in state F out of total population} = \frac{3}{8} \times 80 = 30\%$$

$$\text{Required Percentage} = \frac{7\% \text{ of } 6x}{30\% \text{ of } 7x} \times 100 = 20\%$$

8. For which state, the population of females below poverty line is the maximum?

Sol. The state with maximum female below poverty line population cannot be determined because only the percentages and ratios for below poverty line populations are given, not the actual populations of each state.

(ii) Missing Table DI: In missing table DI, where some values or data of the table DI is not provided or missing and we need to find those missing values with the help of the questions associated with the DI or some notes and data provided with the DI.

Example

Directions (1-5): Study the table carefully and answer the questions.

Table given below shows the number of items sold by five persons on five different days.

Persons \ Days	A	B	C	D	E
Monday	420	440	240	—	280
Tuesday	360	—	520	210	410
Wednesday	280	240	410	425	—
Thursday	540	510	—	630	160
Friday	—	460	350	510	400

Note: Some data are missing, calculate the missing data if required.

1. If total item sold by A and B including all five days is 2000 and 2200 respectively. Then item sold by B on Tuesday is what percent more/less than item sold by A on Friday?

Sol; Items sold by A on Friday = $2000 - (420 + 360 + 280 + 540) = 2000 - 1600 = 400$

$$\text{Items sold by B on Tuesday} = 2200 - (440 + 240 + 510 + 460) = 550$$

$$\text{Required \%} = \frac{(550-400)}{400} \times 100 = 37.5\%$$

2. If ratio of items sold by B and C together on Thursday to items sold by C and E together on same day is 2 : 1. Then find item sold by C on Thursday?

Sol.: Let items sold by C on Thursday be x .

$$\text{ATQ, } \frac{510+x}{x+160} = \frac{2}{1}$$

$$510 + x = 2x + 320$$

$$x = 190$$

3. What is difference of item sold by A on Monday and Friday. If total item sold by A is 1800?

Sol; Item sold by A on Friday = $1800 - 1600 = 200$

$$\text{Required difference} = 420 - 200 = 220$$

4. If average of items sold by D on Monday and Tuesday is 245. Then items sold by D on Monday is what percent of item sold by E on Friday?

Sol; Items sold by D on Monday = $245 \times 2 - 210 = 280$

$$\text{Required \%} = \frac{280}{400} \times 100 = 70\%$$

5. If items sold by C on Thursday is average of items sold by C on Wednesday and Friday then find total items sold by C?

Sol; Required total = $\left(\frac{410+350}{2}\right) + 250 + 520 + 410 + 350 = 1900$

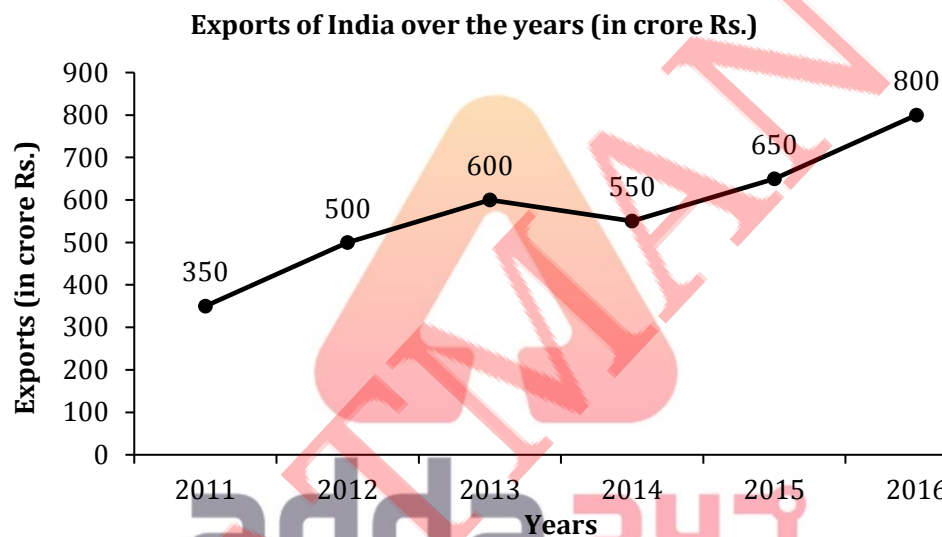
Line Graph

It is a type of graph in which the variable does not change according to any law but changes abruptly (broken off suddenly). It indicates the variation of one parameter with respect to another (X-axis, Y-axis). It determines trends and rate of change over the time. We can easily see data movement in case of line graph.

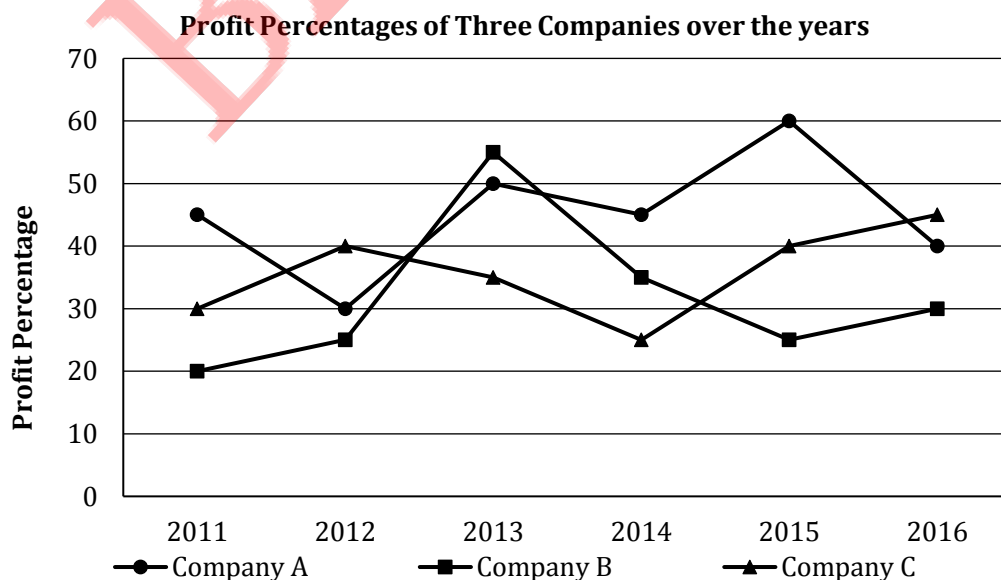
This graph can be classified into following categories.

- (i) Simple line graph
- (ii) Multiple lines graph

- (i) **Simple line graph:** It is also known as single dependent variable graph. It is plotted against the independent factor. The former is plotted on Y-axis while the latter is plotted on the X-axis.



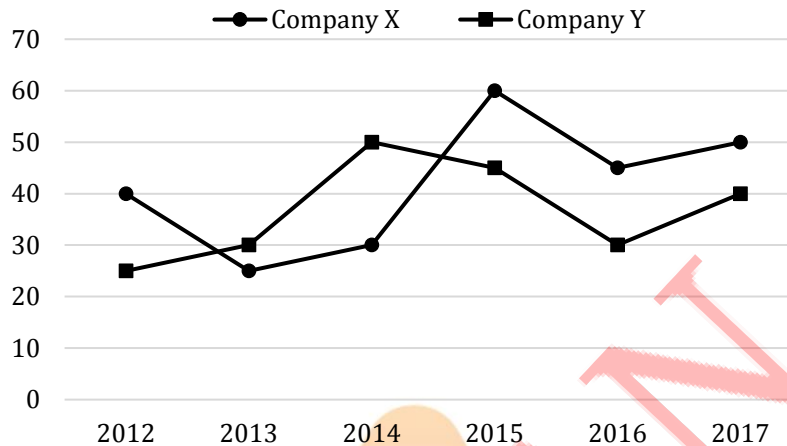
- (ii) **Multiple lines graph:** In this graph more than one dependent variable is plotted against the independent variable. The Y-axis is common to all the variables.



Example:**Directions (1-7):** study the following graph to answer the given questions.

$$\text{Profit \%} = \frac{\text{Income} - \text{Expenditure}}{\text{Expenditure}} \times 100$$

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Percent profit earned by two companies over the given years:**Types of question asked:**

1. If the expenditure of Company X in 2015 was equal to the expenditure of Company Y in that year, then what was the ratio of their respective incomes?

Sol.: Let the expenditure of Company X and Y in 2015 be Rs.x

$$\begin{aligned} \text{Ratio of Income of Company X and Y in 2015} &= (100\% + 60\%) \text{ of } x : (100\% + 45\%) \text{ of } x \\ &= 160\% \text{ of } x : 145\% \text{ of } x = 32 : 29 \end{aligned}$$

2. For Company Y, the income in 2012 was equal to the expenditure in 2014. What was the ratio of its respective incomes in these two years?

Sol.: Let the income in 2012 and expenditure in 2014 of Company Y be Rs.x

$$\text{Income of Company Y in 2014} = (100\% + 50\%) \text{ of } x = 150\% \text{ of } x = \text{Rs.}1.5x$$

$$\text{Ratio of Income of Company Y in 2012 and in 2014} = x : 1.5x = 2 : 3$$

3. In 2017, the income of Company Y was Rs.35 crore. What was the expenditure of the company in that year?

$$\text{Sol.} \quad \text{Expenditure of Company Y in 2017} = \frac{35}{100 + 40} \times 100 = \frac{35}{140} \times 100 = \text{Rs.}25 \text{ crore}$$

4. In 2016, the income of Company Y was Rs.52 crore and the expenditures for both the companies were same in that year. What was the average of incomes of both the companies in that year?

$$\text{Sol.} \quad \text{Expenditure of Company Y in 2016} = \frac{52}{100 + 30} \times 100 = \frac{52}{130} \times 100 = \text{Rs.}40 \text{ crore}$$

$$\text{Expenditure of Company X in 2016} = \text{Rs.}40 \text{ crore}$$

$$\text{Income of Company X in 2016} = (100\% + 45\%) \text{ of } 40 = \text{Rs.}58 \text{ crore}$$

$$\text{Average of incomes of both the companies in 2016} = \frac{58 + 52}{2} = \frac{110}{2} = \text{Rs.}55 \text{ crore}$$

5. For which year, the actual profit amount for Company X is the maximum?

Sol.: Actual profit amount cannot be determined because only the profit percentages are given but the actual amounts of expenditure or income for the company are not given.

6. For which year, the difference in the actual profit amount for both the companies is the maximum?

Sol.: Difference in the actual profit amounts for the companies cannot be determined because only the profit percentages are given but the actual amounts of expenditure or income for the companies are not given.

7. If the ratio of expenditures of Company X in 2013 and 2017 is 4 : 3 respectively, then the income of Company X in 2013 is how much percent more/less than the income of Company X in 2017?

Sol.: Let the expenditures of Company X in 2013 and 2017 be Rs.4x and Rs.3x respectively.

Income of Company X in 2013 = (100% + 25%) of 4x = Rs.5x

Income of Company X in 2017 = (100% + 50%) of 3x = Rs.4.5x

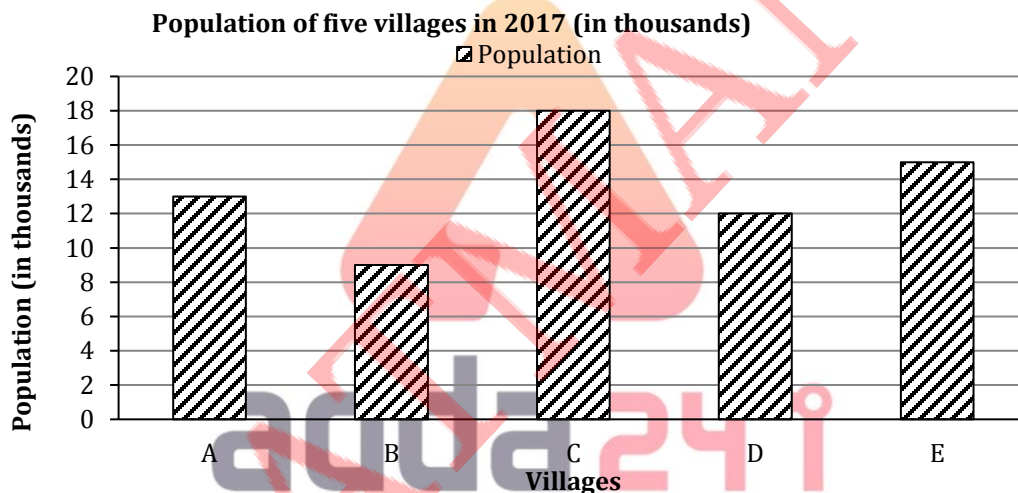
Required Percentage = $\frac{5x - 4.5x}{4.5x} \times 100 = \frac{0.5x}{4.5x} \times 100 = 11\frac{1}{9}\%$ more

Bar Graph:

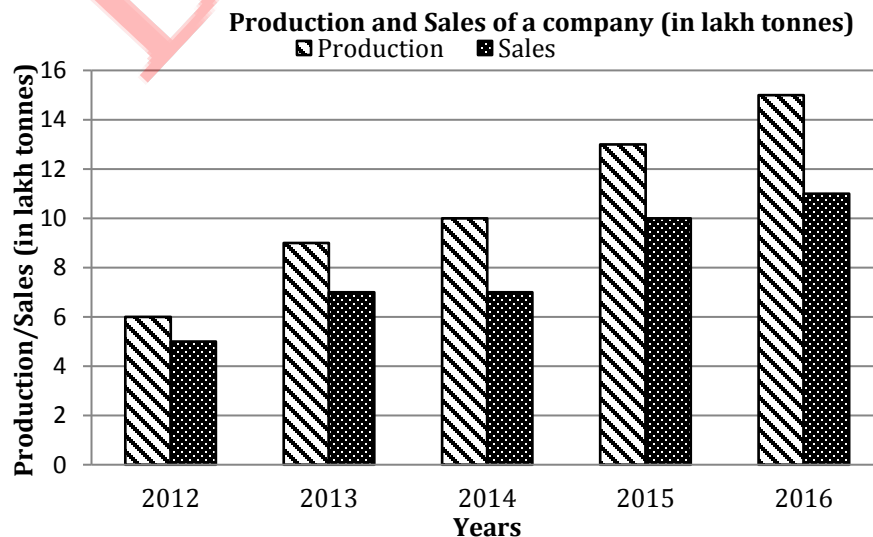
Bar Graph is the most commonly used method of representing data among the graphs. It is drawing the form of rectangular bars of uniform width with equal spaces between them where the length of the bars is proportional to the values they represent. It can be drawn either horizontally or vertically. Effective representation of Bar graph is mainly classified into the followings categories:

- (i) Simple bar group
- (ii) Multiple Bar graph
- (iii) Sub-dividend Bar graph or cumulative Bar graph

- (i) **Simple Bar graph:** It represents only one variable with equal width but of varying heights in proportion to the values of the variable.

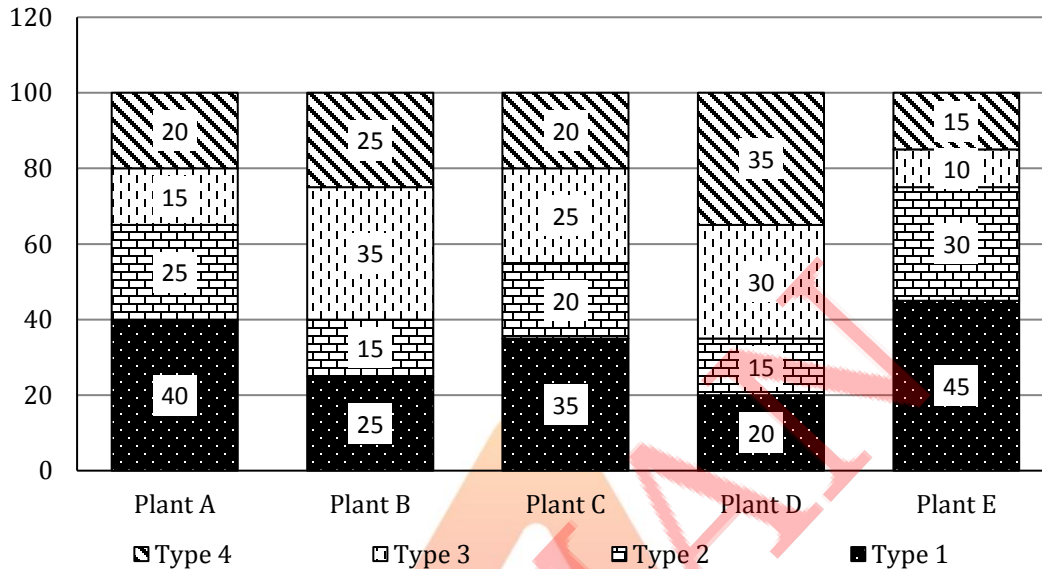


- (ii) **Multiple Bar group:** In this graph, two or more bar graphs are constructed adjoining one another in a single graph, to represent either different multiple variables or different components of a single variable.



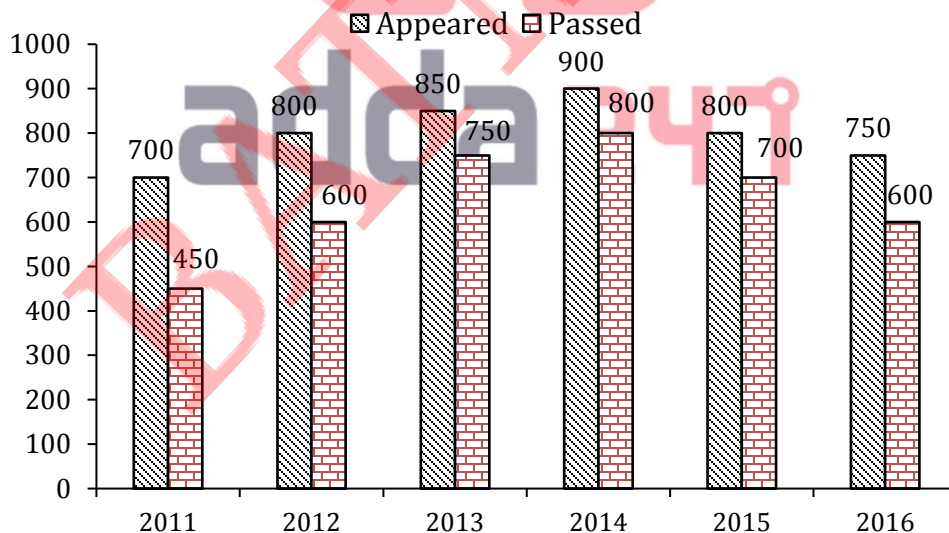
- (iii) **Sub-dividend or cumulative Bar graph:** In this graph, total value as well as individual component values of a variable are pictorially represented as a single bar. The variable is to be divided into various components. It is drawn proportionally in length to the total and divided in the ratios of their components.

Percentage Distribution of Different Types of Cars Produced by Five Plants in 2016



Example:

Directions (1-6): Study the following bar graph carefully and answer the questions given below:
Number of students appeared and passed in an exam over the years:



Types of question asked:

- What was the average number of candidates appeared in the exam over the years?

Sol: Required Average = $\frac{700 + 800 + 850 + 900 + 800 + 750}{6} = \frac{4800}{6} = 800$

- What is the ratio of number of students who did not pass the exam in 2011 to that in 2016?

Sol.: Required Ratio = $(700 - 450) : (750 - 600) = 250 : 150 = 5 : 3$

3. For which year, the percentage of students who passed the exam is the maximum?

Sol.: Percentage of passed students:

$$\text{In 2011} = \frac{450}{700} \times 100 = 64\frac{2}{7}\%$$

$$\text{In 2012} = \frac{600}{800} \times 100 = 75\%$$

$$\text{In 2013} = \frac{750}{850} \times 100 = 88\frac{4}{17}\%$$

$$\text{In 2014} = \frac{800}{900} \times 100 = 88\frac{8}{9}\%$$

$$\text{In 2015} = \frac{700}{800} \times 100 = 87\frac{1}{2}\%$$

$$\text{In 2016} = \frac{600}{750} \times 100 = 80\%$$

Hence, the percentage of passed students is the maximum for the year 2014.

4. For which year, the percentage increase/decrease in the number of passed students from the previous year is the minimum?

Sol.: Percentage increase/decrease in the number of passed students:

$$\text{In 2012} = \frac{150}{450} \times 100 = 33\frac{1}{3}\%$$

$$\text{In 2013} = \frac{150}{600} \times 100 = 25\%$$

$$\text{In 2014} = \frac{50}{750} \times 100 = 6\frac{2}{3}\%$$

$$\text{In 2015} = \frac{100}{800} \times 100 = 12\frac{1}{2}\%$$

$$\text{In 2016} = \frac{100}{700} \times 100 = 14\frac{2}{7}\%$$

Hence, the percentage increase/decrease in the number of passed students is the minimum for the year 2014.

5. What is the total number of students who did not pass the exam over the years?

Sol.: Total number of students who did not pass the exam

$$= 250 + 200 + 100 + 100 + 100 + 150 = 900$$

6. The total number of students who passed the exam from 2011 to 2013 is how much percent more/less than the total number of students who passed the exam from 2014 to 2016?

Sol.: Number of students passed from 2011 to 2013 = $450 + 600 + 750 = 1800$

$$\text{Number of students passed from 2014 to 2016} = 800 + 700 + 600 = 2100$$

$$\text{Required Percentage} = \frac{2100 - 1800}{2100} \times 100 = 14\frac{2}{7}\% \text{ less}$$

Pie Chart:

It is circular representation of data where the data is represented as a part of a circle. The total quantity is distributed over a total angle of 360° . The circle represents the total value (360° or 100%) and the different parts or sectors represent certain proportions (degree or percentage value) of the total. The value of each component is in proportion to the circular area (or central angle) representing the component. It may be classified in the following categories:

- (i) Simple Pie chart
- (ii) Multiple Pie Charts

Note: The sector of circle is divided mainly into two ways:

(a) In degrees: In this representation, the given data is distributed over a total angle of 360° . Each part makes a certain angle called central angle.

$$\therefore \text{Central angle of a sector} = (\text{Value of sector}) / (\text{Total value}) \times 360^\circ$$

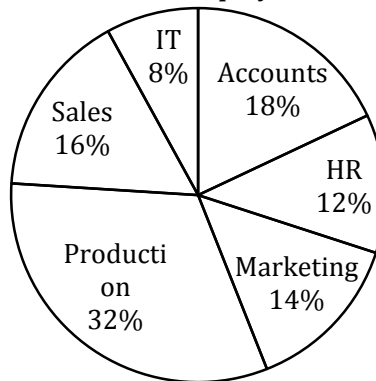
(b) In percentage – In this representation, the given data is distributed over a total of 100%. For solution we take base 100.

$$\therefore \text{Percentage value of a sector} = (\text{Value of sector}) / (\text{Total value}) \times 100$$

Example:

Directions (1-8): Study the following Pie Chart carefully and answer the questions given below:
Percentage Distribution of Employees in Different Departments of a Company:

Total number of employees = 8000

**Types of question asked:**

1. What is the total number of employees in Accounts and Marketing departments together?

Sol.: Number of employees in Accounts and Marketing together = $(18\% + 14\%)$ of total employees
= 32% of $8000 = 2560$

2. What is the difference between the number of employees in Production and Sales departments?

Sol.: Difference between number of employees in Production and Sales = $(32\% - 16\%)$ of total employees = 16% of $8000 = 1280$

3. What is the ratio of number of employees in IT and HR department together to the number of Sales and Marketing departments together?

Sol.: Required ratio = $(8\% + 12\%)$ of total employees : $(16\% + 14\%)$ of total employees = $2 : 3$

4. The number of employees in HR department is how much percent more/less than the number of employees in Production department?

Sol.: Required percentage = $\frac{32\% \text{ of total employees} - 12\% \text{ of total employees}}{32\% \text{ of total employees}} \times 100 = \frac{20}{32} \times 100 = 62.5\% \text{ less}$

5. What is the average of total number of employees in Accounts, HR, Marketing and Production departments together?

Sol.: Total number of employees in Accounts, HR, Marketing and Production together
= $(18\% + 12\% + 14\% + 32\%)$ of total employees = 76% of total employees

Required average = $\frac{76\% \text{ of total employees}}{4} = 19\%$ of total employees = 19% of $8000 = 1520$

6. If number of employees in Sales department is increased by 25% in the next year, then what is number of employees in the department in the next year?

Sol.: Number of employees in Sales department in next year
= $(100\% + 25\%)$ of number of employees in Sales department this year
= 125% of 16% of $8000 = 20\%$ of $8000 = 1600$

7. If numbers of employees in IT and Marketing departments are increased by 60% and 20% respectively in the next year, then what is the ratio of numbers of employees in these departments in the next year?

Sol.: Required Ratio = 160% of 8% of total employees : 120% of 14% of total employees
= $16 : 21$

8. If the ratio of numbers of male and female employees in Accounts department is 5 : 4 and 60% of the employees in the HR department are females, then what is the total number of male employees in these departments together?

Sol.: Number of male employees in Accounts department = $\frac{5}{9} \times 18\%$ of 8000 = 10% of 8000 = 800

Number of male employees in HR department = (100% - 60%) of 12% of 8000
= 40% of 12% of 8000 = 4.8% of 8000 = 384

Total Number = 800 + 384 = 1184

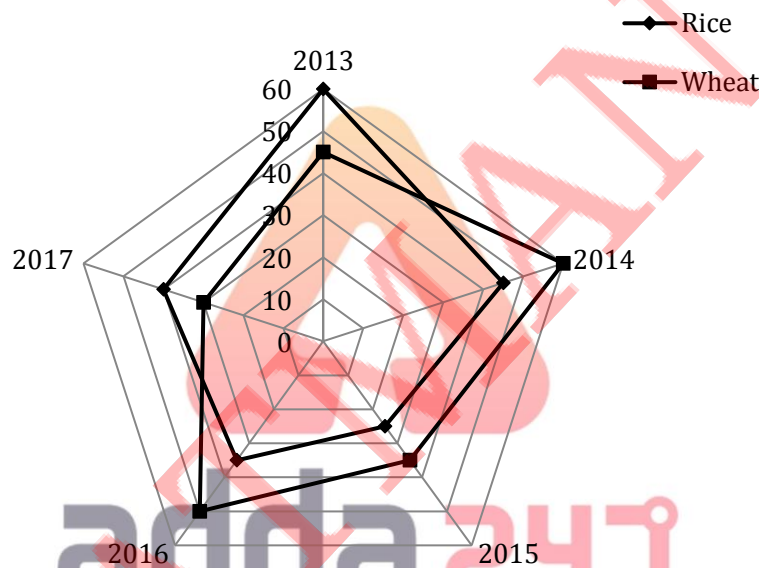
Radar Graph:

In this graph, the values of variables are represented with respect to a central point. The values are represented in proportion with the distances from this central point. This graph can be seen as a circular line graph. This graph is also known as spider or web graph.

Example:

Directions (1-5): Study the following radar graph carefully and answer the questions that follow:

The production of rice and wheat (in lakh tonnes) in a state in five years:



Types of question asked:

1. What is the average of total wheat production in the state over the years?

Sol.: Required Average = $\frac{45 + 60 + 35 + 50 + 30}{5} = \frac{220}{5} = 44$ lakh tonnes

2. What is the ratio of productions of wheat and rice from year 2013 to 2016?

Sol.: Required Ratio = (45 + 60 + 35 + 50) : (60 + 45 + 25 + 35) = 190 : 165 = 38 : 33

3. Production of rice in 2016 is how much percent more/less than the production of wheat in the same year?

Sol.: Required Percentage = $\frac{50 - 35}{50} \times 100 = \frac{3}{10} \times 100 = 30\%$ less

4. For which year, the difference between the production of rice and wheat is the minimum?

Sol.: Difference between the production of rice and wheat:

For 2013 = 15 lakh tonnes

For 2014 = 15 lakh tonnes

For 2015 = 10 lakh tonnes

For 2016 = 15 lakh tonnes

For 2017 = 10 lakh tonnes

Hence, the difference is the minimum for the years 2015 and 2017.

5. For which year, the percentage increase/decrease in the production of rice from the previous year is the maximum?

Sol.: Percentage increase/decrease in the production of rice:

For 2014 = 25% decrease

For 2015 = $44\frac{4}{9}\%$ decrease

For 2016 = 40% increase

For 2017 = $14\frac{2}{7}\%$ increase

Hence, the percentage increase/decrease is the maximum for the year 2015.

Mixed Graph:

It is not based on a single graph but on a combination of two or more graphs. These graphs may or may not represent similar variables. If the variables represented by these graphs are not similar, then the relationship between these variables is mentioned in the question along with the other data which is useful in solving the questions.

It can mainly be classified into the following categories:

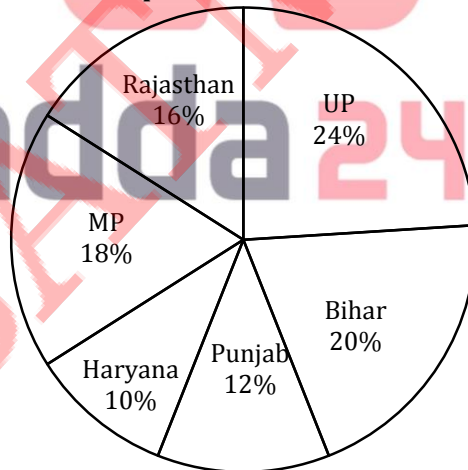
- Table and Bar Graph
- Table and Line Graph
- Table and Pie Chart
- Bar Graph and Line Graph
- Pie Chart and Bar Graph
- Pie Chart and Line Graph

Example:

Directions (1-6): Study the pie chart and table carefully and answer the following questions:

Percentage Distribution of population of 6 states out of total population:

Total Population in 2011 = 50 crore



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Ratio of male to female population and literate to illiterate population in these states:

State	Sex M : F	Literacy Literate : Illiterate
UP	7 : 5	3 : 5
Bihar	3 : 2	2 : 3
Punjab	5 : 7	3 : 1
Haryana	7 : 3	3 : 2
MP	4 : 5	1 : 2
Rajasthan	5 : 3	1 : 3

Types of question asked:

1. What is the total population of illiterate people in Punjab and Haryana together?

Sol.: Total population of illiterate people in Punjab and Haryana together

$$= \frac{1}{4} \text{ of population of Punjab} + \frac{2}{5} \text{ of population of Haryana}$$

$$= \frac{1}{4} \text{ of } 12\% \text{ of } 50 \text{ crore} + \frac{2}{5} \text{ of } 10\% \text{ of } 50 \text{ crore}$$

$$= 3\% \text{ of } 50 \text{ crore} + 4\% \text{ of } 50 \text{ crore}$$

$$= 7\% \text{ of } 50 \text{ crore} = 3.5 \text{ crore}$$

2. Total literate population in MP is how much percent of the total illiterate population in UP?

Sol.: Required percentage = $\frac{\text{Total literate population in MP}}{\text{Total illiterate population in UP}} \times 100$

$$= \frac{\frac{1}{3} \text{ of } 18\% \text{ of total population}}{\frac{5}{8} \text{ of } 24\% \text{ of total population}} \times 100 = \frac{6}{15} \times 100 = 40\%$$

3. If the total population of Rajasthan and Bihar is increased by 20% and 25% respectively in comparison to the previous year, then what will be ratio of male population of these two states if the ratio of male to female population remains the same as previous year?

Sol.: Required Ratio = $120\% \text{ of } \frac{5}{8} \text{ of } 16\% : 125\% \text{ of } \frac{3}{5} \text{ of } 20\% = 12\% : 15\% = 4 : 5$

4. What is the population of literate females in Bihar?

Sol.: Population of literate females in Bihar cannot be determined because ratio of literate to illiterate population is given for total population of the state, not for male or female population.

5. If 50% of male population is literate in MP, then what percent of female population in MP is literate?

Sol.: Percentage of literate population in MP = $\frac{1}{3} \text{ of } 18\% \text{ of total population} = 6\% \text{ of total population}$

$$\text{Percentage of male population in MP} = \frac{4}{9} \text{ of } 18\% \text{ of total population} = 8\% \text{ of total population}$$

$$\text{Percentage of female population in MP} = 18\% \text{ of total population} - 8\% \text{ of total population}$$

$$= 10\% \text{ of total population}$$

$$\text{Percentage of literate male population in MP} = 50\% \text{ of } 8\% \text{ of total population}$$

$$= 4\% \text{ of total population}$$

$$\text{Percentage of literate female population in MP} = 6\% \text{ of total population} - 4\% \text{ of total population}$$

$$= 2\% \text{ of total population}$$

$$\text{Required Percentage} = \frac{\text{literate female population in MP}}{\text{Total female population in MP}} \times 100 = \frac{2\% \text{ of total population}}{10\% \text{ of total population}} \times 100 = 20\%$$

6. What is the average male population of Bihar, Haryana and MP?

Sol.: Total male population of Bihar, Haryana and MP

$$= \left(\frac{3}{5} \text{ of } 20\% + \frac{7}{10} \text{ of } 10\% + \frac{4}{9} \text{ of } 18\% \right) \text{ of total population}$$

$$= (12\% + 7\% + 8\%) \text{ of total population}$$

$$= 27\% \text{ of total population}$$

$$\text{Required Average} = 9\% \text{ of total population} = 9\% \text{ of } 50 \text{ crore} = 4.5 \text{ crore}$$

Caselet:

It is a comprehensive type question where the information is given in the form of paragraphs or multiple sentences which provide the details of all the parameters involved including their inter-relationships. The information can be converted into either tabular form or Venn-Diagram to solve the questions. In the recent patterns, caselets related to the various quantitative aptitude topics are also seen where a situation is described with in the form of a paragraph with data and conditions. We have to use the data and solve the questions according to the given conditions.

On the recent pattern of competitive exams Caselet DO can be classified into following categories.

(i) Basic & Tabular based caselet DI

(ii) Venn diagram based Caselet DI

(iii) Filler & Arithmetic based caselet DI

- (i) **Basic & Tabular based caselet DI** : In Basic & Tabular based caselet DI we represent the solution or inputs which we get from given paragraph in the form of table.

Example:

Directions (1-8): Study the following information carefully and answer the questions that follow:

There are four departments in a company – Production, Marketing, Sales and HR. 40% of the total employees in the company works in Production department and 60% of the total employees working the Production department are males. Half of the rest of the employees works in Marketing department and the ratio of male and female employees in the department is 3 : 7. The number of employees working in the Sales department is one-fifth of the total employees. Number of females working in Sales department is 16 less than number of females working in production department. Number of males working in HR department is 40% of the number of males working in Sales department. Total number of the employees working the company is 1600.

Sol.: The information given above can be converted a table as follows:

Departments	Total Employees		Males		Females	
	Percentage	Number	Percentage	Number	Percentage	Number
Production	40%	640	24%	384	16%	256
Marketing	30%	480	9%	144	21%	336
Sales	20%	320	5%	80	15%	240
HR	10%	160	2%	32	8%	128

Note: Percentages are given out of total number of employees in the company.

Types of question asked:

1. What is the percentage of female employees working in the company?

Sol.: Percentage of female employees in the company = 16% + 21% + 15% + 8% = 60%

2. What is the total number of female employees working in Marketing, Sales and HR departments?

Sol.: Number of female employees working in Marketing, Sales and HR departments
= 336 + 240 + 128 = 704

3. What is the average of number of male employees working in all the departments together?

Sol.: Number of male employees working in all the departments = 40% of total employees
Required Average = 10% of total employees = 160

4. What is the ratio of number of male employees working in Production department to the number of female employees working in Marketing department?

Sol.: Required Ratio = 24% of total employees : 21% of total employees = 8 : 7

5. The number of male employees working in Sales department is how much percent more/less than the number of female employees working in HR department?

Sol.: Required Percentage = $\frac{8\% \text{ of total employees} - 5\% \text{ of total employees}}{8\% \text{ of total employees}} \times 100 = \frac{3}{8} \times 100 = 37.5\% \text{ less}$

6. In which department, the number of female employees working is the maximum?

Sol.: Marketing department

7. 40% of the female employees working in Sales department are postgraduates, then what is number of female employees working in Sales department who are not postgraduates?

Sol.: Number of female employees working in Sales department who are not postgraduates
= (100% - 40%) of number of female employees working in Sales department
= 60% of 240 = 144

8. 40% of the female employees working in Sales department are postgraduates, then what is number of male employees working in Sales department who are not postgraduates?

Sol.: The number of male employees working in Sales department, who are not postgraduates, cannot be determined because the information about the educational qualifications of male employees in the department is not given.

(ii) Venn diagram based Caselet DI : In Venn diagram based caselet we represent the solution or inputs which we get from given paragraph in the form of Venn diagram. For solving these type of caselet DI frequently we should know some key points before.

- (i) what is venn diagram.
- (ii) How to make a venn diagram.
- (iii) Concept of sets, union, intersection, subtraction, either & only.

Venn diagram :

A Venn diagram is a visual depiction of the similarities and differences between two or more different items. It consists of a series of shapes - usually circles - whose edges overlap. While it's not required that you use a circle, it's probably the most convenient shape because several circles can overlap easily.

How to make a venn diagram :

- The first step to creating a Venn diagram is deciding what to compare. Place a descriptive title at the top of the page.
- Create the diagram. Make a circle for each of the subjects. Every circle should overlap with at least one other circle.
- Label each circle. Near or inside of each circle place the name of the topic or item which the circle represents. Avoid writing the titles inside neighboring circles in order to maintain clarity. It may be useful to distinguish the titles from other text by placing them in a box or altering their font or color.
- Enter the differences. Inside each circle place characteristics that are unique to that specific item or idea, and are not true of any of the other topics.
- Enter the similarities. If two or more subjects have a feature in common, place that feature in the section in which all such shapes overlap.

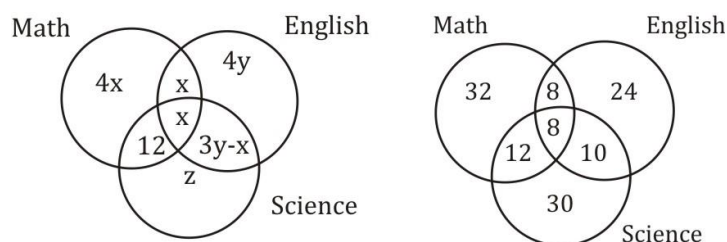
Example -

Directions (1-2): Read the given information carefully and answer the following questions.

In a class, there are 124 students and they study three subjects i.e. Math, Science and English. Number of students studying Math and Science are equal. Number of students studying all the subjects together is 50% of the students studying Math and English together, which is half of the number of students studying only Math. Ratio of students studying only English to students studying English and Science together is 4: 3. Number of students studying only Math and Science together is 12, which is half of number of students studying only English.

- Find the ratio of number of students studying only Math to the number of students studying only Science?
 (a) 16: 15 (b) 15: 14 (c) 8: 5 (d) 8: 7 (e) 9: 8
- Find the number of students studying only English is what percent of the number of students studying all the subjects together?
 (a) 200% (b) 250% (c) 300% (d) 150% (e) 175%

Sol. (1-2):



Let the number of students Studying only English and that of studying English and Science together be $4y$ and $3y$ respectively

Let number of students studying Math and English together be $2x$. Number of students studying all the Subjects together
 $= \frac{2x}{2} = x$

Number of Students Studying Only Math = $4x$
 Number of students studying only English = 24
 ATQ,
 $4y = 24 \Rightarrow y = 6$
 Let the number of students studying only science be Z .
 Number of students studying math and science are equal.
 So,
 $4x + x + x + 12 = 12 + x + (3 \times 6 - x) + z$
 $\Rightarrow z = 6x - 18$
 Now,
 $4x + x + x + 12 + (18 - x) + (6x - 18) + 24 = 124$
 $\Rightarrow 11x = 88 \Rightarrow x = 8$

1. (a): Required ratio = $\frac{32}{30} = 16:15$
2. (c): Required percentage = $\frac{24}{8} \times 100 = 300\%$

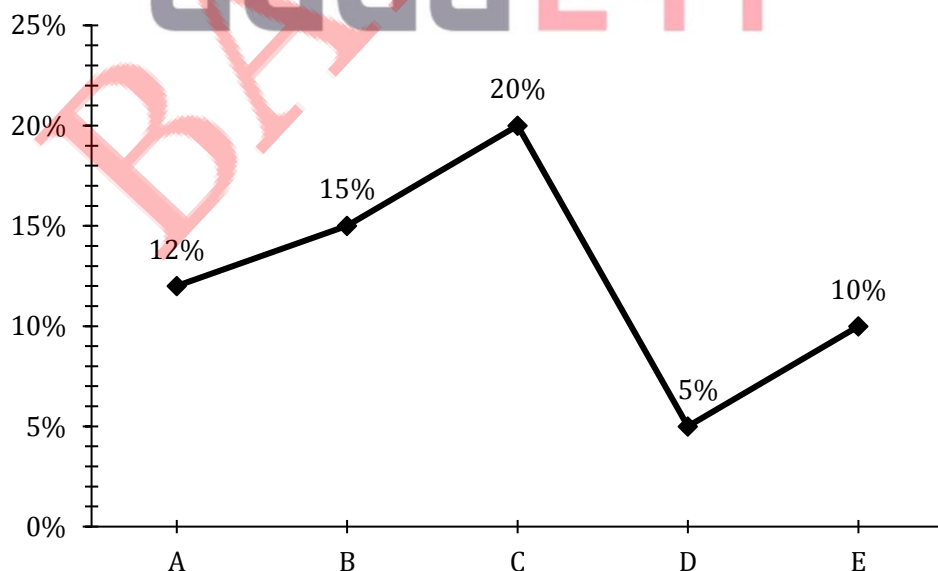
(iii) **Filler & Arithmetic based caselet DI** : Nowadays in the exams Caselet DI is asked which has fillers or blanks or some alphabetical letters given in it. These blanks or letters contain certain data which is asked in the questions associated with Caselet also mostly times the filler caselet DI based on arithmetic chapters. So solve these type of caselets DI one has to be well versed in arithmetic topics and their respective concepts.

Arithmetic :

In this type of DI data representing arithmetic equations and conditions in bar graphs, line graph, pie chart, table or in any other form of DI. So it is necessary to understand the actual concept of arithmetic chapters (i.e. Time and work, Boat and stream, Speed time distance, Pipe and cistren, Profit and loss, Mensuration, Probability etc) to solve this type of DI frequently.

Point is arithmetic DI is not as hard as student consider it in exams, it is always easier than actual arithmetic questions that are asked in exam.

Before solving a question, we must exactly know the information given in the graphs.

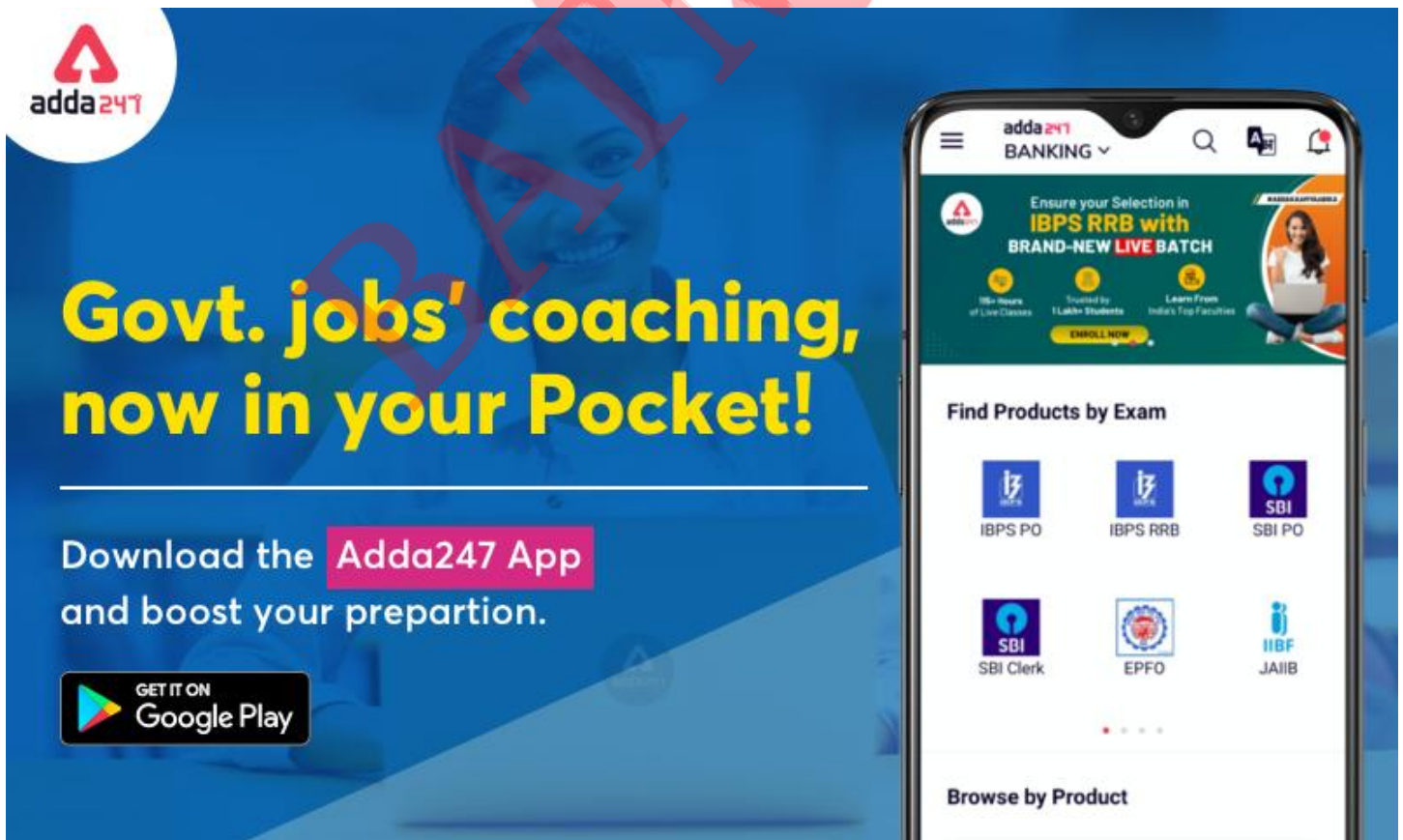


For example, Consider that this graph shows profit % for selling these items. In question, if examiner ask to calculate actual selling price, then he must mention the CP or some other clue in exam.

- Q1.** Profit earned on selling item C is Rs. 160, what is amount of profit earned for item D, if both items have same selling price?
- Sol:** This is a typical DI question. Now look, if we know that 20% means Rs 160 we can calculate actual CP of item C. (Profit % is always calculated on CP).

$$\text{CP OF ITEM C} = 160 \times \frac{100}{20} = 400.$$
 It means SP of item C is Rs. 560
 Also SP of item D is Rs. 560. And then we can calculate CP and amount of profit of item D.

New pattern : In the recent exams we have seen that different DI's other than Pie, Line, Table etc are being asked. Some of these types of DI are Funnel DI, Scattered DI, Data Sufficiency based DI, Histogram, Box & whisker etc. As in the normal DI questions are being asked on the data provided in the graph, in the same way questions are being asked as in the data provided in these types of DI.



The advertisement features a blue background with a smiling woman. On the left, the Adda247 logo is in the top left corner. The main text in large yellow font reads "Govt. jobs' coaching, now in your Pocket!". Below this, it says "Download the Adda247 App and boost your preparation." with a "GET IT ON Google Play" button. On the right, a smartphone displays the app's interface, which includes a "BANKING" header, a banner for "IBPS RRB with BRAND-NEW LIVE BATCH", and a section titled "Find Products by Exam" with icons for IBPS PO, IBPS RRB, SBI PO, SBI Clerk, EPFO, and IIBF JAIIB. At the bottom of the phone screen, it says "Browse by Product".

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Chapter 02

Table

Tables are one of the most versatile methods of systematic representation of quantitative data where the data is represented through horizontal rows and vertical columns. In fact, the data that can be represented on any type of graph/chart can also be represented on a table, but the reverse is not always true. Also, the amount of data that can be represented on a table is much higher than that can be represented on any other graph/chart. But tables are a little harder to interpret when the number of variables represented is higher, due to their less visual impact.

Table DI can be classified into following categories.

(i) Basic Table DI

(ii) Missing Table DI

(i) Basic Table DI: In Basic table DI, no data is missing and all data is provided in columns and rows in a table in either alphabetic or chronologic order. Either the columns or the rows will represent different values to describe the variables. You have to evaluate data based on the questions asked from the table data.

(i) Basic Table DI contains:

- *Concept with Solved Examples*
- *Practice MCQs for Prelims*
- *Practice MCQs for Mains*
- *Previous Years' Questions of Prelims*
- *Previous Years' Questions of Mains*

Solved Examples of Basic Table DI

Directions (1-6) :- The table given below shows the no. of students enrolled in 4 different colleges over the years. Study the data carefully and answer the following questions.

College \ year	A	B	C	D
2015	600	450	500	350
2016	550	400	650	450
2017	700	500	600	550
2018	300	350	400	500

- What is the average no. of students enrolled in college B over the given years?
(a) 450 (b) 400 (c) 425 (d) 475 (e) 500
- If in year 2016, 20% students of college B enrolled in B.SC, 30% students enrolled in B.COM and remaining students enrolled in BCA, then find the difference between BCA students and B.SC students.
(a) 200 (b) 80 (c) 100 (d) 120 (e) 140
- Students enrolled in college A in year 2015 and 2016 together is what percent more or less than students enrolled in college C in year 2017 and 2018 together?
(a) 15% (b) 25% (c) 30% (d) 12% (e) 20%
- If the ratio between girls and boys in college B in 2016 is 3 : 5 and ratio between girls and boys in college C in 2017 is 7 : 5, then find the ratio between girls of college B in 2016 to boys of college C in 2017.
(a) 2 : 5 (b) 3 : 5 (c) 1 : 3 (d) 2 : 3 (e) 5 : 3
- Students enrolled in college A in 2017 is what percent of students enrolled in college B in the same year?
(a) 120% (b) 40% (c) 28% (d) 71% (e) 140%
- Total students enrolled in year 2015 in all the colleges together is how much more/less than total students enrolled in 2018 in all the colleges together?
(a) 250 (b) 450 (c) 150 (d) 350 (e) 550

S1. (c): required average = $\frac{450+400+500+350}{4} = \frac{1700}{4} = 425$

S2. (d): students enrolled in B.SC = $\frac{20}{100} \times 400 = 80$
 Students enrolled in BCA = $\frac{(100-20-30)}{100} \times 400 = 200$
 Required difference = $200 - 80 = 120$

S3. (a): required percentage = $\frac{(600+550)-(600+400)}{(600+400)} \times 100$
 $= \frac{150}{1000} \times 100 = 15\%$

S4. (b): no. of girls in college B in 2016 = $\frac{3}{8} \times 400 = 150$
 And no. of boys in college C in 2017 = $\frac{5}{12} \times 600 = 250$
 Required ratio = $\frac{150}{250} = \frac{3}{5}$

S5. (e): required percentage = $\frac{700}{500} \times 100 = 140\%$

S6. (d): required difference = $(600 + 450 + 500 + 350) - (300 + 350 + 400 + 500)$
 $= 1900 - 1550 = 350$

Directions (7-11) :- The table given below shows the no. of books published by 4 different publishers in 4 months. Study the data and answer the following questions.

Month Publisher	February	March	April	May
A	2000	2400	1800	2500
B	1500	1850	2000	2100
C	1750	2000	2250	2400
D	1200	1350	800	1250

7. What is the average no. of books published by A in all the given months?
 (a) 1740 (b) 2275 (c) 2050 (d) 2175 (e) 2250
8. Books published by B in February and March together is what percent more/less than that by C in March and April? (approximate)
 (a) 21% (b) 24% (c) 16% (d) 12% (e) 27%
9. Find the ratio between books published by C to D in all given months.
 (a) 23 : 45 (b) 24 : 43 (c) 42 : 23 (d) 41 : 25 (e) 23 : 42
10. Find the revenue obtained by B in March is how much more/less than that by D in same month, if selling price of book is Rs 120 and all books are sold. (Note – cost price and selling price of each book is same for all publishers)
 (a) Rs 50,000 (b) Rs 40,000 (c) Rs 55,000 (d) Rs 70,000 (e) Rs 60,000
11. Books published by A in April is what percent of book published by C in March?
 (a) $\frac{1000}{9}\%$ (b) 90% (c) 10% (d) $\frac{100}{9}\%$ (e) 75%
- S7. (d): Required average = $\frac{2000+2400+1800+2500}{4} = \frac{8700}{4} = 2175$
- S8. (a): Required percentage = $\frac{(2000+2250)-(1500+1850)}{(2000+2250)} \times 100$
 $= \frac{4250-3350}{4250} \times 100 = \frac{900}{4250} \times 100$
 $= \frac{360}{17} = 21.176 \approx 21\%$
- S9. (c): Required ratio = $\frac{1750+2000+2250+2400}{1200+1350+800+1250} = \frac{8400}{4600} = 42:23$
- S10. (e): Difference in revenue = $(1850 - 1350) \times 120 = 500 \times 120 = \text{Rs } 60,000$
- S11. (b): Required percentage = $\frac{1800}{2000} \times 100 = 90\%$

Direction (12 – 16): Table given below shows number of ball point pen sold by five stores and ratio of number of ball point pens to gel pens sold by these stores.

Stores	Total ball point pens sold	Ratio of ball point pens to gel pens sold
A	108	9 : 5
B	240	6 : 5
C	200	4 : 1
D	150	3 : 1
E	120	3 : 2

12. Find the ratio of total gel pens sold by store C & D together to total gel pens sold by store A?
 (a) 3 : 5 (b) 5 : 3 (c) 5 : 4 (d) 5 : 2 (e) 3 : 2
13. Total gel pens sold by store E is what percent less than total gel pens sold by store B?
 (a) 20% (b) 80% (c) 40% (d) 50% (e) 60%
14. If selling price of one ball point pen is 5 Rs. and that of one gel pen is Rs. 8, then find total revenue generated by store C?
 (a) 1600 Rs. (b) 2000 Rs. (c) 1200 Rs. (d) 1400 Rs. (e) 1800 Rs.

15. Find average number of gel pens sold by store A, & E?
 (a) 80 (b) 40 (c) 50 (d) 70 (e) 65
16. If out of total gel pens sold by B & C, 40% and 20% pens are returned respectively by customers (due to not working properly), then find total number of actual pens sold by store B & C together?
 (a) 400 (b) 540 (c) 600 (d) 640 (e) 500

S12. (b): Total gel pens sold by store C & D together = $200 \times \frac{1}{4} + 150 \times \frac{1}{3} = 100$

Total gel pens sold by store A = $108 \times \frac{5}{9} = 60$

Required ratio = $100 : 60 = 5 : 3$

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S13. (e): Total gel pens sold by E = $120 \times \frac{2}{3} = 80$

Total gel pens sold by B = $240 \times \frac{5}{6} = 200$

Required percentage = $\frac{200-80}{200} \times 100 = 60\%$

S14. (d): Total revenue generated by store C = $200 \times 5 + 200 \times \frac{1}{4} \times 8$
 $= 1000 + 400 = 1400$ Rs.

S15. (d): Total gel pens sold by store A = $108 \times \frac{5}{9} = 60$

Total gel pens sold by E = $120 \times \frac{2}{3} = 80$

Required average = $\frac{60+80}{2} = 70$

S16. (c): Total number of actual pens sold by store B & C together

$= (240 + 240 \times \frac{5}{6} \times \frac{60}{100}) + (200 + 200 \times \frac{1}{4} \times \frac{80}{100})$

$= 360 + 240$

$= 600$

Directions (17-21): Study the table given below and answer the following questions.

Table gives information about election held in 5 different villages (A, B, C, D & E).

Villages	Registered voters	% of votes cast	% of valid votes
A	36000	75%	90%
B	45000	80%	75%
C	40000	50%	100%
D	50000	80%	60%
E	25000	60%	80%

Note –

1. % of votes cast in any village = $\frac{\text{Total votes cast in that village}}{\text{Total registered voters in that village}} \times 100$

2. % of valid votes in any village = $\frac{\text{Total valid votes of that village}}{\text{Total votes cast in that village}} \times 100$

17. Find invalid votes of village – A & D together.

- (a) 15400 (b) 18700 (c) 14000 (d) 16000 (e) 15200

18. Votes cast in village – A & B together are what percent of valid votes of village – D.

- (a) 262.5% (b) 225% (c) 137.5% (d) 175% (e) 225%

19. Find average of valid votes in villages – B, D & E.

- (a) 15000 (b) 18000 (c) 16000 (d) 21000 (e) 20000

20. Total invalid votes of village – D & E together are how much more or less than total votes cast in village – C?

- (a) 1500 (b) 3000 (c) 2500 (d) 1000 (e) 2000

21. Valid votes of village – A & C together are what percent more or less than votes cast in village – D & E together?

- (a) $45\frac{5}{11}\%$ (b) $36\frac{6}{11}\%$ (c) $19\frac{5}{11}\%$ (d) $28\frac{5}{11}\%$ (e) $30\frac{6}{11}\%$

S17. (b): Required number of votes = $\left(36000 \times \frac{75}{100} \times \frac{10}{100}\right) + \left(50000 \times \frac{80}{100} \times \frac{40}{100}\right)$
 $= 2700 + 16000 = 18700$

S18. (a): Votes cast in village – A & B together = $\left(36000 \times \frac{75}{100}\right) + \left(45000 \times \frac{80}{100}\right)$
 $= 27000 + 36000 = 63000$
 Valid votes of village – D = $\left(50000 \times \frac{80}{100} \times \frac{60}{100}\right) = 24000$
 Required % = $\frac{63000}{24000} \times 100$
 $= 262.5\%$

S19. (d): Required average = $\frac{1}{3} \times \left(\left(45000 \times \frac{80}{100} \times \frac{75}{100}\right) + \left(50000 \times \frac{80}{100} \times \frac{60}{100}\right) + \left(25000 \times \frac{60}{100} \times \frac{80}{100}\right)\right)$
 $= \frac{1}{3} \times (27000 + 24000 + 12000) = 21000$

S20. (d): Total invalid votes of village – D & E together = $\left(50000 \times \frac{80}{100} \times \frac{40}{100}\right) + \left(25000 \times \frac{60}{100} \times \frac{20}{100}\right)$
 $= 16000 + 3000$
 $= 19000$
 Total votes cast in village – C = $\left(40000 \times \frac{50}{100}\right)$
 $= 20000$
 Required difference = $20000 - 19000 = 1000$

S21. (c): Valid votes of village – A & C together = $\left(36000 \times \frac{75}{100} \times \frac{90}{100}\right) + \left(40000 \times \frac{50}{100} \times \frac{100}{100}\right)$
 $= 24300 + 20000 = 44300$
 Votes cast in village – D & E together = $\left(50000 \times \frac{80}{100}\right) + \left(25000 \times \frac{60}{100}\right)$
 $= 40000 + 15000 = 55000$
 Required % = $\frac{55000 - 44300}{55000} \times 100 = 19\frac{5}{11}\%$

Direction (22-26): The table given below shows the total number of graduates, percentage of unemployed graduates out of total graduates and respective ratio of male and female unemployed graduates in 5 states.

States	Graduate Population	% of unemployed graduates	(Female: male) unemployed graduates
Haryana	10000	51%	9:8
Gujrat	50000	66%	6:5
Maharashtra	60000	50%	3:2
Uttar Pradesh	80000	45%	1:2
Bihar	75000	20%	7:8

22. In which state male graduates who are unemployed are lowest?

- (a) Gujrat (b) Bihar (c) Haryana (d) Maharashtra (e) Uttar Pradesh

23. Find out the ratio between female unemployed graduate from Uttar Pradesh and male unemployed graduates from Haryana?

- (a) 2:3 (b) 3:2 (c) 1:5 (d) 5:1 (e) 3:4

24. Find out the average number of female unemployed graduate from Haryana, Gujarat and Uttar Pradesh?

- (a) 11000 (b) 10900 (c) 12000 (d) 10000 (e) 12500

25. Number of female unemployed graduate from Bihar is what percent of male employed graduate from Maharashtra?

- (a) 58.33% (b) 50.55% (c) 45.45% (d) 65.50% (e) 70.55%

26. Total number of unemployed graduates in Gujarat is how much more than that of in Haryana?

- (a) 25900 (b) 26900 (c) 27900 (d) 28900 (e) 29900

Solution (22-26):

$$\text{Number of female unemployed graduates in Haryana} = 10000 \times \frac{51}{100} \times \frac{9}{17} = 2700$$

$$\text{Number of male unemployed graduates in Haryana} = 10000 \times \frac{51}{100} \times \frac{8}{17} = 2400$$

$$\text{Number of female unemployed graduates in Gujarat} = 50000 \times \frac{66}{100} \times \frac{6}{11} = 18000$$

$$\text{Number of male unemployed graduates in Gujrat} = 50000 \times \frac{66}{100} \times \frac{5}{11} = 15000$$

$$\text{Number of female unemployed graduates in Maharashtra} = 60000 \times \frac{50}{100} \times \frac{3}{5} = 18000$$

$$\text{Number of male unemployed graduates in Maharashtra} = 60000 \times \frac{50}{100} \times \frac{2}{5} = 12000$$

$$\text{Number of female unemployed graduates in Uttar Pradesh} = 80000 \times \frac{45}{100} \times \frac{1}{3} = 12000$$

$$\text{Number of male unemployed graduates in Uttar Pradesh} = 80000 \times \frac{45}{100} \times \frac{2}{3} = 24000$$

$$\text{Number of female unemployed graduates in Bihar} = 75000 \times \frac{20}{100} \times \frac{7}{15} = 7000$$

$$\text{Number of male unemployed graduates in Bihar} = 75000 \times \frac{20}{100} \times \frac{8}{15} = 8000$$

S22. (c): Lowest number of male unemployed graduates is in Haryana, which is 2400.

Or

By observing the table we can see that we do not have to calculate males for each state in this question. Graduate population of all states except Haryana is equal to or above 50000 but for Haryana it is 10000 and percentage distribution of unemployed graduates is approximately same for all states except Bihar. So, we should only check for unemployed males graduates for these two states only

S23. (d): Required ratio = 12000:2400 = 5:1

S24. (b): Average number of female unemployed = $\frac{2700+18000+12000}{3} = 10900$

S25. (a): Required % = $\frac{7000}{12000} \times 100 = 58.33\%$

S26. (c): Required difference = (18000+15000) – (2700+2400) = 27900

Directions (27-31): Study the table given below and answer the following questions.

The table gives information about employees in 5 different departments of a company. Total employees in any department = Total (male + female) employees in that department.

Departments	Total employees	% of female employees out of total employees	% of graduated employees out of total employees	Total graduated male employees
Production	6,000	20%	40%	1500
Finance	1,200	40%	80%	500
R & D	800	60%	90%	480
Marketing	4,000	45%	60%	1800
HR	600	75%	80%	360

Note –

1. % of female employees in any department = $\frac{\text{Total female employees in that department}}{\text{Total employees in that department}} \times 100$

2. % of graduated employees in any department = $\frac{\text{Total graduated employees in that department}}{\text{Total employees in that department}} \times 100$

27. Total graduated employees in the Finance and R & D departments together are how much more or less than total male employees in the Marketing department?

- (a) 570 (b) 520 (c) 540 (d) 550 (e) 560

28. Non – graduated female employees in the Production and Marketing departments together are what percent of total employees in the Production and Marketing departments together?

- (a) 15% (b) 20% (c) 18% (d) 12% (e) 24%

- 29.** The average of graduated employees in the Production, Marketing & HR departments are what percent more or less than total employees in the Finance department?
 (a) $33\frac{1}{3}\%$ (b) $66\frac{2}{3}\%$ (c) $23\frac{1}{3}\%$ (d) $46\frac{2}{3}\%$ (e) $83\frac{1}{3}\%$
- 30.** The total number of male employees in the Finance and R & D departments together are how much more or less than graduated female employees in Marketing & HR departments together?
 (a) 360 (b) 350 (c) 280 (d) 240 (e) 320
- 31.** Find the total number of graduated female employees in Production, Finance and R & D departments together?
 (a) 1,500 (b) 1,600 (c) 1,800 (d) 1,200 (e) 1,000

S27. (b): Total graduated employees in Finance and R & D departments together

$$= \left(1,200 \times \frac{80}{100}\right) + \left(800 \times \frac{90}{100}\right)$$

$$= 960 + 720 = 1,680$$

$$\text{Total male employees in Marketing department} = 4,000 \times \frac{100-45}{100} = 2,200$$

$$\text{Required difference} = 2,200 - 1,680 = 520$$

S28. (a): Non - graduated female employees in Production = $\left(6,000 \times \frac{20}{100}\right) - \left(\left(6,000 \times \frac{40}{100}\right) - 1,500\right)$
 $= 1,200 - 900 = 300$

$$\text{Non - graduated female employees in Marketing} = \left(4,000 \times \frac{45}{100}\right) - \left(\left(4,000 \times \frac{60}{100}\right) - 1,800\right)$$

$$= 1,800 - 600$$

$$= 1,200$$

$$\text{Required \%} = \frac{300+1,200}{6,000+4,000} \times 100$$

$$= \frac{1,500}{10,000} \times 100$$

$$= 15\%$$

S29. (d): Average of graduated employees in Production, Marketing & HR departments

$$= \frac{1}{3} \times \left(\left(6,000 \times \frac{40}{100}\right) + \left(4,000 \times \frac{60}{100}\right) + \left(600 \times \frac{80}{100}\right)\right)$$

$$= \frac{1}{3} \times (2,400 + 2,400 + 480)$$

$$= 1,760$$

$$\text{Required \%} = \frac{1,760-1,200}{1,200} \times 100$$

$$= 46\frac{2}{3}\%$$

S30. (e): Total number of male employees in Finance & R & D departments together

$$= \left(1,200 \times \frac{100-40}{100}\right) + \left(800 \times \frac{100-60}{100}\right)$$

$$= 720 + 320$$

$$= 1040$$

Graduated female employees in Marketing & HR departments together

$$= \left(\left(4,000 \times \frac{60}{100}\right) - 1,800\right) + \left(\left(600 \times \frac{80}{100}\right) - 360\right)$$

$$= 600 + 120$$

$$= 720$$

$$\text{Required difference} = 1040 - 720$$

$$= 320$$

S31. (b): Required number of female employees

$$= \left(\left(6,000 \times \frac{40}{100}\right) - 1,500\right) + \left(\left(1,200 \times \frac{80}{100}\right) - 500\right) + \left(\left(800 \times \frac{90}{100}\right) - 480\right)$$

$$= 900 + 460 + 240$$

$$= 1,600$$

Directions (32-36): Study the following table and answer the given questions

Given below is the table showing the persons who attended the seminar from 5 villages M, N, O, P and Q. There are some literate and Some illiterate persons who attended the seminar, studying the table and answer the following questions.

Villages	Total person (Male + Female)	(Men) Literate : Illiterate	(Men) Literate	(Total) Literate : Illiterate
M	14700	6 : 5	4200	24 : 25
N	9600	5 : 3	1500	31 : 17
O	6300	2 : 1	3000	40 : 23
P	9600	5 : 7	2000	19 : 29
Q	13000	9 : 7	4500	83 : 47

Note: Total persons who attended seminar = Total illiterate + Total Literate.

- 32.** What is the difference between illiterate men from village M and O together and village N and Q together?
 (a) 600 (b) 550 (c) 250 (d) 280 (e) 500
- 33.** Illiterate men from village P and M together who attended seminar are what percent more or less than the total literate person from village N and O together
 (a) 25.5% (b) 26.2% (c) 38.23% (d) 22.35% (e) 28%
- 34.** What is the ratio of literate female from village O to the illiterate female from village Q.
 (a) 2 : 3 (b) 4 : 3 (c) 5 : 2 (d) 5 : 6 (e) 7 : 6
- 35.** What is the sum of illiterate women from village N and O and illiterate men from village M and Q together?
 (a) 99000 (b) 11000 (c) 90800 (d) 10300 (e) None of these
- 36.** Sum of illiterate men from village M and P together and literate women from village N and O together are what percent of total people from village M and N together. (approximately)
 (a) 37% (b) 45% (c) 28% (d) 43% (e) 50%

S32. (a): Illiterate men from M and O together = $\frac{4200}{6} \times 5 + \frac{3000}{2} \times 1$
 $= 3500 + 1500 = 5000$

Illiterate men from N and Q together = $\frac{1500}{5} \times 3 + \frac{4500}{9} \times 7$
 $= 900 + 3500 = 4400$
 Required difference = $5000 - 4400 = 600$

S33. (c): Illiterate men from village P and M together = $\frac{2000}{5} \times 7 + \frac{4200}{6} \times 5$
 $= 2800 + 3500 = 6300$

Total literate person from village N and O together = $\frac{9600}{48} \times 31 + \frac{6300}{63} \times 40$
 $= 6200 + 4000 = 10200$
 Required % = $\frac{3900}{102} = 38.23\%$

S34. (d): Literate female from village O = $\frac{6300}{63} \times 40 - 3000 = 1000$

Illiterate female from village Q = $\frac{13000}{130} \times 47 - \frac{4500}{9} \times 7$
 $= 4700 - 3500 = 1200$
 Required ratio = 5 : 6

S35. (d): Illiterate women from village N and O together = $\left(\frac{9600}{48} \times 17 - \frac{1500}{5} \times 3\right) + \left(\frac{6300}{63} \times 23 - \frac{3000}{2} \times 1\right)$
 $= (3400 - 900) + (2300 - 1500)$
 $= 2500 + 800 = 3300$

Illiterate men from village M and Q together = $\frac{4200}{6} \times 5 + \frac{4500}{9} \times 7$
 $= 3500 + 3500 = 7000$
 Required sum = 10300

$$36. \text{ (e): Illiterate men from village M and P together} = \frac{4200}{6} \times 5 + \frac{2000}{5} \times 7$$

$$= 3500 + 2800$$

$$= 6300$$

$$\text{Literate woman from village N and O together} = \left(\frac{9600}{48} \times 31 - 1500 \right) + \left(\frac{6300}{63} \times 40 - 3000 \right)$$

$$= (6200 - 1500) + (1000)$$

$$= 5700$$

$$\text{Required \%} = \frac{6300+5700}{14700+9600} \times 100$$

$$= \frac{12000}{243} \approx 50\%$$

Directions (37-41) : The following table shows the result of semester exams of 6 students in different subjects. Some of the values are given in absolute form while the others are given as a percentage of the total marks obtained by that student in all exams together. Study it carefully and answer the following questions.

	Physics (M.M. 100)	Chemistry (M.M. 80)	Math's (M.M. 120)	English (M.M.-75)	Computers (M.M.60)	Physical education (M.M.90)
Gaurav	82	61	28%	65	12	8%
Atul	20%	15%	25%	48	45	75
Vikas	12%	25	26%	50	35	18%
Arun	44	20%	30%	20	6	25%
Sanjeev	77	5%	20%	63	42.5	80
Sameer	20%	78	105.5	8%	10%	80

Note – M.M. denotes maximum marks in each subject.

37. Average number of marks scored by Sanjeev in all of the subject are how much less than the total number of marks scored by all of them in Physics?

$$(a) 337\frac{1}{3}$$

$$(b) 343\frac{2}{3}$$

$$(c) 338\frac{1}{3}$$

$$(d) 337\frac{2}{3}$$

(e) None of these

38. If Seema scored $20\frac{30}{41}\%$ more marks than Gaurav in physics then marks scored by Seema in Physics are how much percent more/less than the marks scored by Gaurav in Math subject?

$$(a) 2\frac{7}{9}\%$$

$$(b) 1\frac{3}{8}\%$$

$$(c) 2\frac{6}{7}\%$$

$$(d) 3\frac{4}{7}\%$$

(e) None of these

39. How much percent marks did Arun score in all of the subjects together?

$$(a) 54\frac{1}{3}\%$$

$$(b) 49\frac{2}{3}\%$$

$$(c) 52\frac{2}{9}\%$$

$$(d) 53\frac{1}{3}\%$$

(e) None of these

40. Marks scored by Arun in math's and physical education together is what percent to total marks scored by Atul in all subjects together?

$$(a) 35\frac{2}{3}\%$$

$$(b) 36\frac{2}{3}\%$$

$$(c) 31\frac{1}{3}\%$$

$$(d) 36\frac{1}{3}\%$$

(e) None of these

41. Sanjeev applied for rechecking for math's subject as his marks were below than expected. As a result of rechecking his marks are increased by 15. Then find the percentage increase in his marks after rechecking.

$$(a) 21\frac{1}{7}\%$$

$$(b) 21\frac{2}{7}\%$$

$$(c) 21\frac{3}{7}\%$$

$$(d) 21\frac{4}{7}\%$$

(e) None of these

$$S37. \text{ (b): Average no. of marks scored by Sanjeev} = \frac{(77+63+42.5+80)}{75} \times 100 \times \frac{1}{6}$$

$$= 58\frac{1}{3}$$

Marks scored by all of them in Physics

$$= 82 + \frac{48+45+75}{40} \times 20 + \frac{25+50+35}{44} \times 12 + 44 + 77 + \frac{78+105.5+80}{62} \times 20$$

$$= 82 + 84 + 30 + 44 + 77 + 85$$

$$= 402$$

$$\text{Required score} = 402 - 58\frac{1}{3} = 343\frac{2}{3}$$

S38. (c): Marks scored by Seema in Physics = $120 \frac{30}{41} \%$ of 82 = 99

Marks scored by Gaurav in math = $\frac{(82+61+65+12)}{64} \times 28 = 96.25$

Required % = $\frac{99-96.25}{96.25} \times 100 = 2 \frac{6}{7} \%$

S39. (d): Required % = $\frac{\frac{(44+20+6)}{25} \times 100}{(100+80+120+75+60+90)} \times 100$
 $= \frac{280}{525} \times 100 = 53 \frac{1}{3} \%$

S40. (b): Marks of Arun in math's and physical education = $\frac{55}{25} \times 70 = 154$

Total score of Atul = 420

Required percentage = $\frac{154}{420} \times 100 = 36 \frac{2}{3} \%$

S41. (c): Marks of Sanjeev in math's = $\frac{20}{75} \times 262.5 = 70$

New marks after rechecking = 85

Percentage increase = $\frac{15}{70} \times 100 = 21 \frac{3}{7} \%$

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Directions (42-46): Read the following tables and answer the questions given below it.

There are five companies which produces Diwali Fireworks in different months.

Percentage distribution of production of these five companies out of total production by them in different months

Company→ Month↓	P	Q	R	S	T
June	28%	32%	15%	18%	7%
July	23%	28%	9%	14%	26%
August	38%	38%	9%	8%	7%
September	20%	43%	7%	16%	14%
October	70%	8%	7%	8%	7%
November	31%	35%	13%	10%	11%

Following table shows the production of fireworks in units by these companies together in different months

June	P+Q	1920
July	R+S+T	1715
August	Q+R	1833
September	P+Q+T	3311
October	R	266
November	S+T	1218

Note- first row implies the production of P and Q together in June and as all rows.

- 42.** If in December the no. of fireworks produced was 20% more than the firework produced in the month of November and the ratio b/w the fireworks produced in December by the company P, Q, R, S and T is 11 : 13 : 17 : 5 : 41, then find the no. of firework produced by company T in the month of December?
 (a) 3370 (b) 3140 (c) 3280 (d) Can't determined (e) None of these
- 43.** No of fireworks produced by company P and R together in July is Approximate what percent more/less than that of company S and T together in the month of November?
 (a) 6% (b) 8% (c) 10% (d) 12% (e) 15%
- 44.** What is the ratio of the total no of fireworks produced in the month of July, August and September together to the total no of fireworks produced in the month of October and November together?
 (a) 131 : 29 (b) 143 : 97 (c) 153 : 17 (d) Can't determined (e) None of these

45. In October month, 70% of the fireworks produced by P was sold, 75% of the fireworks produced by S was sold and 50% of the total no of fireworks produced by Q, R and T was together sold, then find the no of fireworks sold by all of these companies in October?
 (a) 2508 (b) 2602 (c) 2498 (d) Can't determine (e) None of these
46. What is the maximum difference between total number of fireworks produced in any month over previous month? .
 (a) 2000 (b) 1000 (c) 500 (d) 400 (e) 4000

S42. (c): December $\rightarrow \frac{120}{100} \times \left(\frac{1218}{21} \times 100 \right) = 6960$

Required no of firework produced by T
 $= \frac{41}{87} \times 6960 = 3280$

- S43. (b): Fireworks produced by P and R in July

$$= \frac{(23+9) \times 1715}{(9+14+26)} = 35 \times 32 = 1120$$

Fireworks produced by S and T in November

$$= \frac{(11+10) \times 1218}{21} = 1218$$

$$\text{Required \%} = \frac{1218-1120}{1218} \times 100 = 8.04\% = 8\%$$

- S44. (e): Required Ratio = $(3500 + 3900 + 4300)$

$$= (3800 + 5800)$$

$$= 13700 : 9600 = 137 : 96$$

- S45. (a): Required No of fireworks sold

$$= (0.7 \times 2660) + (0.75 \times 304)$$

$$+ 0.5 \times (836)$$

$$= 1862 + 228 + 418 = 2508$$

- S46. (a): July $\rightarrow (3500 - 3200) = 300$

$$\text{August} \rightarrow (3900 - 3500) = 400$$

$$\text{September} (4300 - 3900) = 400$$

$$\text{October} (3800 - 4300) = 500$$

$$\text{November} (5800 - 3800) = 2000$$

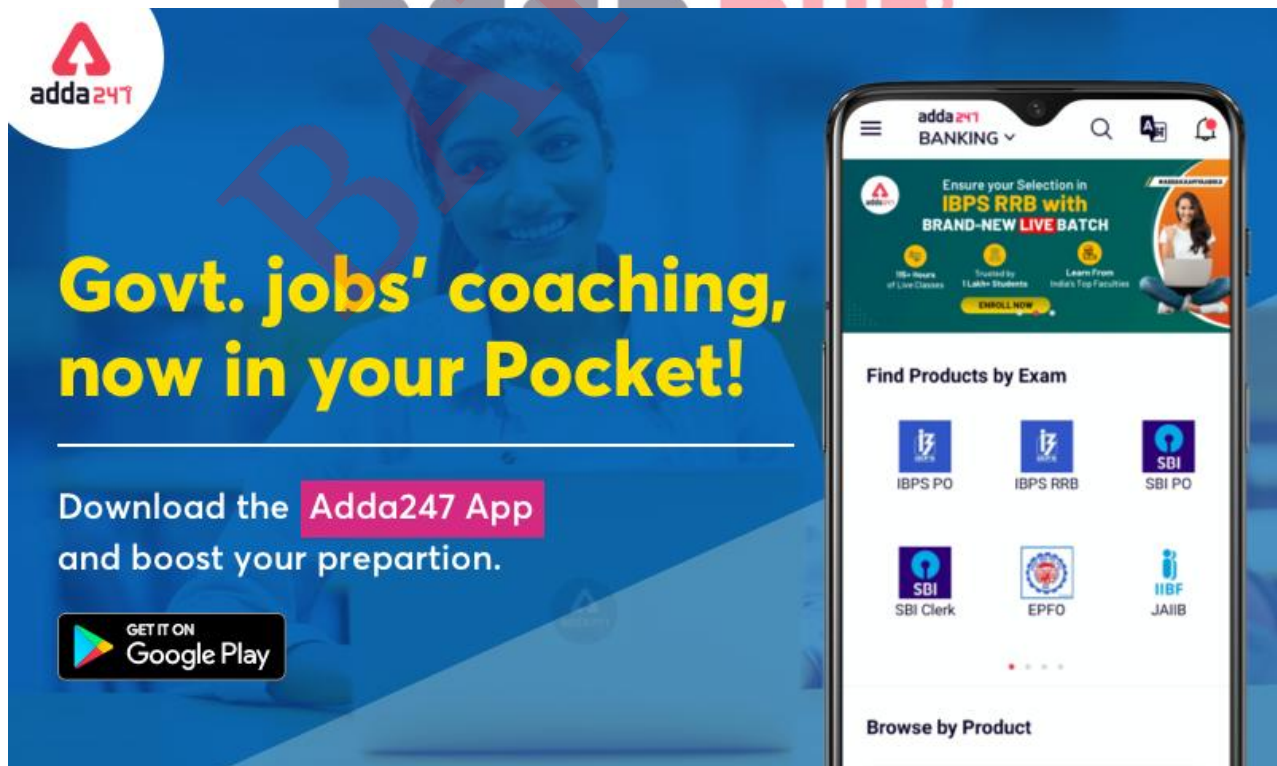
Direction: (47-50) Given table shows the number of students appeared the exam of S.B.I PO. Prelims, percentage of students appeared mains, number of females selected for interview and ratio between number of males to number of females appeared prelims exam form five cities.

Cities	Number of students appeared prelims	% of students Appeared mains	No. of female selected for interview	Ratio of M.F. appeared prelims
J	7800	45%	351	6 : 7
K	10000	26%	460	1 : 4
L	80000	20%	300	5 : 3
M	90000	10%	560	2 : 7
N	6000	40%	275	2:3

Note: Percentage of students appeared for mains is w.r.t. to no. of students appeared prelims. Students selected for interview is out of students appeared for mains.

47. If in city L, $\frac{35}{8}\%$ student passed mains exam then, male student who appeared in interview from city L is what percent of total male student who appeared in prelims from city L
 (a) 1% (b) 0.2% (c) 0.6% (d) 3% (e) 0.8%
48. In city N, only 1% of female students who appeared for prelims got final selection after interview. Selected female students after interview is 40% of total final selected students after interview. Find total number of students selected after interview.
 (a) 90 (b) 80 (c) 60 (d) 120 (e) 100

49. If in city J, 15% of total Males who appeared in prelims got selected for interview then the no. of females selected for interview are what % of the no. of males selected for the interview in city J?
 (a) 62% (b) 65% (c) 56% (d) 72% (e) 70%
50. If in city K, ratio between number of males to no of female who appeared for mains is 7:6 and ratio between number of males to no. of females got selected for interview is 1:2. Then percentage of males selected for interview out of males appeared in prelims is what percent more or less than the percentage of females selected for interview out of total females appeared in prelims
 (a) 150% (b) 80% (c) 40% (d) 100% (e) 120%
- S47. (e): No. of students appeared mains exam from city L
 $80,000 \times \frac{20}{100} \times \frac{35}{8} \times \frac{1}{100} = 700$
 No. of male student $\rightarrow 700 - 300 = 400$
 Required % = $\frac{400}{80000 \times \frac{5}{8}} \times 100 = 0.8\%$
- S48. (a): No of female selected
 $6000 \times \frac{3}{5} \times \frac{1}{100} = 36$
 No. of male selected = $\frac{36}{40} \times 60 = 54$
 Required number = $36 + 54 = 90$
- S49. (b): Total males select for interview = $\frac{7800 \times 6}{13} \times \frac{15}{100} = 540$
 Required % = $\frac{351}{540} \times 100 = 65\%$
- S50. (d): No of males selected for mains = $10000 \times \frac{26}{100} \times \frac{7}{13} = 1400$
 No. of females selected for mains = 1200
 No. of males selected for interview = $\frac{460}{2} = 230$
 % of males selected for interview = $\frac{230 \times 100}{2000} = 11.5\%$
 % of females selected for interview = $\frac{460 \times 100}{8000} = 5.75\%$
 Required % = $\frac{(11.5 - 5.75)}{5.75} \times 100 = 100\%$



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Practice MCQs for Prelims

Directions (1-5):- Given table shows the data of students of a class related to results of Half-yearly and Annual examination. Study the data carefully and answer the questions.

	Section A	Section B	Section C
Students who have failed in both	10	15	20
Students who have passed Half-yearly	30	30	35
Students who have passed Annual	40	25	30
Students who have passed in both	20	20	25

- How many students are there in Section B of class?
(a) 50 (b) 60 (c) 90 (d) 100 (e) 110
- Students passed in both exams in all sections are what percent more/less than students failed in both exams in all sections?
(a) $44\frac{10}{13}\%$ (b) $30\frac{10}{13}\%$ (c) 40% (d) $44\frac{4}{9}\%$ (e) $40\frac{4}{9}\%$
- what is average of students who passed in only one examination in all sections together?
(a) 39.67 (b) 40.67 (c) 41.67 (d) 42.67 (e) 43.67
- Students failed in both exams in section C are what percent of total students in section C? (in %)
(a) 30 (b) 20 (c) 18 (d) 25 (e) 33.33
- Which sections have equal number of students?
(a) section A & B (b) section A & C (c) section B & C (d) all have same no. of students (e) none

Directions (6-10): Following table gives the detail of items sold by two different stores i.e Store A and Store B and among them percentage of numbers of items purchased by females are given.

Days	Store A		Store B	
	Total items	% of items purchased by females	Total items	% of items purchased by females
Monday	230	30%	320	30%
Tuesday	280	45%	440	65%
Wednesday	335	40%	270	80%
Thursday	360	60%	380	25%
Friday	420	65%	275	40%

- Items purchased by females from store A on Wednesday and Thursday together is how much percent more/less than the total items purchased by males from store B on Thursday and Friday together?
(a) 20% (b) $22\frac{2}{9}\%$ (c) $16\frac{2}{3}\%$ (d) $14\frac{2}{7}\%$ (e) 25%
- Find the respective ratio between total number of items purchased by males from store A on Tuesday and Wednesday together to the total numbers of items purchased by females from store B on Thursday and Friday together ?
(a) 45:73 (b) 41:71 (c) 73:41 (d) 71:41 (e) 37:71
- Find the total number of items purchased by males from store B on all the given days together?
(a) 936 (b) 832 (c) 912 (d) 852 (e) 882
- Total Items purchased on Thursday and Friday together of store A is what percentage of total items purchased on Wednesday and Thursday together of store B ?
(a) 125% (b) 100% (c) 120% (d) 140% (e) 80%
- If total items purchased from store A and Store B on Saturday are 20% more and 30% more respectively than the total items sold by store A and B on Wednesday, then find the total number of items purchased from Store A and Store B together on Saturday?

(a) 828

(b) 753

(c) 783

(d) 807

(e) 823

Directions (11-15): Following table DI gives the detail of magazines printed by five different companies and distributed among different distributors and answer the following question accordingly.

Name of printing magazines company	Total number of copies printed	% of printed magazines distributed among distributors	Number of magazines received by each distributor.
P	5600	80%	64
Q	2400	60%	40
R	3800	75%	95
S	2500	68%	85
T	4500	70%	75

Note: - magazines were equally distributed among the distributors of respective printing companies.

11. What is the average no. of magazines distributed by companies Q, R and T among their respective distributors?
 (a) 2720 (b) 2640 (c) 2480 (d) 2960 (e) 3120
12. Find the total numbers of distributors of magazines of company Q and T together?
 (a) 62 (b) 72 (c) 84 (d) 78 (e) 64
13. Find the respective ratio of the total number of magazines distributed among the distributors of company R to that of the total no. of magazines distributed among distributors of company T?
 (a) 21:19 (b) 19:21 (c) 17:21 (d) 21:17 (e) 17:23
14. Find the average number of books distributed among the distributors by all the five companies together?
 (a) 2784 (b) 2664 (c) 2680 (d) 2756 (e) 2724
15. Find the difference between total no. of distributors of magazines sold by companies P and Q together to the total no. of distributors of magazines sold by companies R and T together?
 (a) 38 (b) 34 (c) 36 (d) 42 (e) 40

Directions (16—20): Study the table given below and answer the following questions.

Table shows the number of girls in 5 different schools (A, B, C, D & E) and ratio of boys & girls in these schools.

School	Number of girls	Ratio of boys to girls
A	720	11 : 9
B	540	3 : 2
C	270	7 : 3
D	576	13 : 12
E	350	8 : 7

16. Find ratio of boys in school – A & E together to boys in school – B & C together.
 (a) 3 : 5 (b) 11 : 14 (c) 8 : 9 (d) 1 : 2 (e) 6 : 11
17. Average number of girls in school – B, C & D is what percent of average number of students in school – A & D?
 (a) 50% (b) 15% (c) 35% (d) 20% (e) None of the above.
18. Students in school – B are how much more than girls in school – E and boys in school – D together?
 (a) 388 (b) 382 (c) 394 (d) 376 (e) 374
19. Students in school – C & E together are what percent more or less than girls in school – A?
 (a) $118\frac{1}{6}\%$ (b) $112\frac{2}{3}\%$ (c) $145\frac{1}{2}\%$ (d) $129\frac{1}{6}\%$ (e) $123\frac{2}{3}\%$
20. Girls in school – A & D together are what percent of boys in school – A & E together?
 (a) $101\frac{1}{4}\%$ (b) $93\frac{3}{4}\%$ (c) $108\frac{1}{2}\%$ (d) $97\frac{3}{4}\%$ (e) $99\frac{1}{2}\%$

Directions (21-25): Table given below shows population of two cities in five different years. Study the data carefully & answer the follow questions.

Cities →		
Year ↓	X	Y
2010	2400	1800
2011	1600	2400
2012	3200	2800
2013	2800	3600
2014	4000	4800

21. Population of city Y in 2014 is what percent more the population of city X in 2012?
 (a) 50% (b) 40% (c) 60% (d) 55% (e) None of these
22. Male population of city X in 2013 is $33\frac{1}{3}\%$ more than female population of city X in 2013. Find the difference b/w male population & female population city of X in 2013?
 (a) 350 (b) 360 (c) 380 (d) 400 (e) 420
23. Total population of X and Y in 2011 divided into three categories i.e., male, female & transgender in the ratio 7 : 5 : 4. Find the difference b/w the male population & female population in 2011.
 (a) 450 (b) 500 (c) 480 (d) 420 (e) 250
24. Average population of city Y in five year is how much more than the average population of city X in five years.
 (a) 280 (b) 250 (c) 270 (d) 240 (e) 300
25. Population of city X in 2015 is 25% more than population of city X in 2012 and population of city Y in 2015 is $11\frac{1}{9}\%$ more than population of city Y in 2013. Find total population of both cities in year 2015.
 (a) 7000 (b) 7500 (c) 8000 (d) 8500 (e) 9000

Directions (26-30): The table given below shows the number of cars, number of two-wheelers and number of buses in three cities A, B and C. Study the table and answer the following questions.

Note: Each city has vehicles of only these three types.

City	No. of cars	No. of two-wheelers (compared to no. of cars)	Ratio of no. of cars to no. of buses
A	6000	120%	4 : 1
B	9000	110%	3 : 2
C	8000	150%	5 : 3

26. What is the difference between average number of buses in city A & B together and B & C together ?
 (a) 1650 (b) 2650 (c) 1750 (d) 2250 (e) none of these
27. What is the ratio of number of four wheelers in city A to the number of two wheelers in city C ?
 (a) 3:8 (b) 5:8 (c) 4:7 (d) 3:5 (e) none of these
38. The number of cars in city B is what percent of the total number of vehicles in the same city ? (approximate value)
 (a) 25% (b) 30% (c) 36% (d) 40% (e) none of these
29. If 200 new buses are added in city C, then find the new percentage of buses in city C ?
 (a) 10% (b) 23% (c) 25% (d) 20% (e) none of these
30. The number of two-wheelers in cities A & C together is how much less/more than the number of four-wheelers in cities B & C together ?
 (a) 7600 (b) 5600 (c) 8600 (d) 8500 (e) none of these

Directions (31-35) :- The table given below shows the number of students appeared in Railway examination of Allahabad zone and percentage of students passed in the examination over the years. Study the table carefully and answer the following questions.

Year	Number of students (in '00) appeared in exam	Percentage of students passed
2013	4000	12%
2014	6400	20%
2015	6900	15%
2016	5200	8%
2017	7500	13%
2018	8400	5%

31. In which of the following year the no. of failed students is maximum?
 (a) 2014 (b) 2016 (c) 2018 (d) 2017 (e) 2015
32. What is the average number of students passed in year 2013, 2015 and 2017?
 (a) 92,000 (b) 83,000 (c) 87,000 (d) 79,000 (e) 81,000
33. Number of students passed in 2018 is how much percentage more or less than students passed in 2013?
 (a) 12.5% (b) 15% (c) 17.5% (d) 20% (e) 10%
34. If in Chandigarh zone no. of students passed in 2018 are 6% of no. of students appeared in Allahabad zone in 2016 and no. of students failed are 80% of no. of students appeared in Allahabad zone in 2013, then find no. of students appeared in Chandigarh zone in 2018.
 (a) 315200 (b) 321500 (c) 531200 (d) 253100 (e) 351200
35. Find the ratio between number of students passed in 2014 to the no. of students failed in 2013.
 (a) 5 : 9 (b) 4 : 9 (c) 6 : 11 (d) 4 : 11 (e) 7 : 11

Directions (36-40):- Following Table chart gives the details of 5 students of a particular school in five different subjects in the annual exam.

	Maths (150)	Physics (150)	Chemistry (150)	English (100)	Computer (100)
Amit	70	66	58	54	80
Aakash	50	64	78	65	75
Siddharth	48	72	88	70	86
Lokesh	80	76	84	75	85
Ritesh	76	82	64	72	94

Note:- the data provided in the table is percentage of marks out of total marks in that particular subject.

36. Total marks scored by lokesh in physics, chemistry and maths together is how much more/less than total marks scored by Amit in the same three subjects together?
 (a) 75 (b) 65 (c) 69 (d) 55 (e) 80
37. Find the overall percentage of marks scored by Siddharth in the exam?
 (a) 75% (b) 82% (c) 68% (d) 72% (e) 80%
38. Find the difference of total marks scored by Ritesh in all the given subject together and total marks scored by Aakash in all the given subjects together?
 (a) 71 (b) 84 (c) 78 (d) 82 (e) 93
39. Find the average marks scored in physics subject by all the given five students together?
 (a) 105 (b) 110 (c) 108 (d) 100 (e) 98
40. Total marks scored by Aakash, Siddharth and Lokesh in English is what percentage of the total marks scored by Amit, Aakash and lokesh in maths?
 (a) 75% (b) 70% (c) 65% (d) 68% (e) 80%

Direction (41 – 45): Given below table shows total three types of items (A, B & C) sold by a store on five days of a week. Table also shows total type A items sold by store and percentage of items B and items C sold by store. Read the data carefully and answer following questions:

Note- only three types of items sold by the store.

Days	Items A	% of items B	% of items C
Monday	240	32%	20%
Tuesday	320	48%	12%
Wednesday	420	45%	20%
Thursday	360	56%	20%
Friday	340	22%	10%

41. Total items B sold by store on Monday & Friday together are what percent less than total items C sold by store on Wednesday & Thursday together?
 (a) 60% (b) 50% (c) 20% (d) 30% (e) 10%
42. Find the difference between average number of items B sold by store on Tuesday & Thursday and average number of items A sold by store on Thursday & Friday?
 (a) 260 (b) 264 (c) 262 (d) 272 (e) 268
43. If total items B sold by store on Sunday is 25% more than that sold on Thursday and total items C sold on Sunday is 300% more than that sold on Friday, then find total number of items B & items C sold by store on Sunday?
 (a) 1250 (b) 1150 (c) 1050 (d) 950 (e) 1350
44. Total items C sold by store on Wednesday is what percent more than total items C sold by store on Monday and Tuesday together?
 (a) $26\frac{22}{49}\%$ (b) $24\frac{22}{49}\%$ (c) $22\frac{22}{49}\%$ (d) $21\frac{22}{49}\%$ (e) $18\frac{22}{49}\%$
45. Find the ratio between total items sold by store on Monday to total items sold by store on Thursday?
 (a) 1 : 5 (b) 1 : 3 (c) 1 : 7 (d) 1 : 4 (e) 1 : 2

Direction (46 – 50): Given below the table shows number of mobiles manufactured by five different plants of 'Samsung' in 2001. Read the data carefully and answer the questions.

Plants	Number of mobiles Manufactured in 2001	Percentage increment in production in 2002 over 2001	Percentage of sold mobiles in 2001
A	900	12	35
B	720	15	62.5
C	960	25	50
D	1080	12.5	40
E	1200	20	60

Total stock available in 2002 of each plant = Manufactured mobiles in 2002 + (Manufactured mobiles in 2001 – Sold mobiles in 2001)

46. Total stock of plant C in 2002 is what percent less than total stock of plant E in 2002?
 (a) 10% (b) 12.5% (c) 15% (d) 20% (e) 25%
47. Find difference between total stock of plant A in 2002 and average of unsold mobiles of plant D & E in 2001 together?
 (a) 1000 (b) 1049 (c) 1099 (d) 1029 (e) 1069
48. Out of total manufactured mobiles by plant B in 2001, 45% are 6GB mobiles and remaining are 8GB mobiles. If out of total sold mobiles by plant B in 2001, 36% are 6GB mobiles, then find ratio of unsold 8GB mobiles in 2001 to total stock of plant D in 2002?
 (a) 4 : 69 (b) 4 : 79 (c) 2 : 69 (d) 2 : 79 (e) 4 : 49

49. Total stock of plant B in the year 2002 is what percent more than total unsold mobiles of plant B & E together in 2001?
 (a) 44% (b) 42% (c) 48% (d) 46% (e) None of these
50. If total sale of plant A & D is increased by 20% and 25% in 2002 over 2001 respectively, then find total unsold mobiles by plant A & D in the year 2002 together?
 (a) 2528 (b) 2548 (c) 2538 (d) 2578 (e) 2518

Direction (51 – 55): Table given below shows ratio of failed girls to failed boys and ratio of passed boys to passed girls and percentage of failed students out of total students in five schools (A, B, C, D & E). Read the data carefully and answer the questions.

Note – All students in each school appeared in exam.

Schools	Ratio of failed girls to failed boys	Ratio of passed boys to passed girls	% of failed students
A	3 : 5	5 : 7	40%
B	4 : 5	4 : 5	30%
C	3 : 4	6 : 7	35%
D	2 : 3	5 : 3	20%
E	2 : 3	7 : 8	25%

51. If difference between passed boys & passed girls from A & E is 80 & 50 respectively, then find total failed girls from both schools together?
 (a) 220 (b) 240 (c) 260 (d) 300 (e) 200
52. If ratio of total failed students from B to that of C is 9 : 7 and total passed students from both the schools together are 1020, then find total students in these two schools together.
 (a) 1400 (b) 1200 (c) 1500 (d) 1000 (e) 800
53. If difference between passed girls and passed boys from D is 100 and total failed students from E are 150% more than that of from D, then find ratio of total students from D to that of from E?
 (a) 2 : 1 (b) 1 : 4 (c) 2 : 3 (d) 1 : 3 (e) 1 : 2
54. If total passed students from E are 56.25% more than that of from A, then find total failed students from A are what percent more than that of from E?
 (a) 24% (b) 28% (c) 32% (d) 30% (e) 20%
55. If total students from C are 25% less than that of from A and total failed students from both schools together are 530, then find average number of passed boys from both schools?
 (a) 120 (b) 170 (c) 190 (d) 180 (e) 160

Directions (56-60): Study the table given below and answer the following questions.

Table shows the number of tea and coffee consumers in 5 different companies (A, B, C, D & E).

Company	Tea consumers		Coffee consumers	
	Male	Female	Male	Female
A	500	300	1400	600
B	1200	1500	500	1000
C	1000	800	900	1500
D	600	900	1500	1000
E	400	1000	800	1200

56. Average female tea consumers in A, C & E together are what percent less than male coffee consumers in B & D together?
 (a) 50% (b) 15% (c) 65% (d) 30% (e) 45%
57. If ratio of male to female black tea consumers and green tea consumers in D is 8 : 7 and 1 : 4 respectively and black tea consumers in D are 50% more than green tea consumers in D, then find black tea consuming females and green tea consuming males together in D are how much more or less than tea consuming females in A & C together? (In D, only two types of tea is available – black and green)
 (a) 560 (b) 420 (c) 450 (d) 500 (e) 540

58. Male tea consumers in C, D & E together are what percent of female coffee consumers in A & B together?
 (a) 150% (b) 75% (c) 100% (d) 175% (e) 125%
59. If ratio of male to female tea and coffee consumers in F is 3 : 2 and 7 : 3 respectively and coffee consumers in F are 20% more than coffee consuming males in D, then find tea and coffee consuming males in F together. (ratio of tea consumers to coffee consumers in F is 5 : 9)
 (a) 1250 (b) 1860 (c) 1480 (d) 1680 (e) None of the above.
60. Find ratio of coffee consuming females in C & E together to tea consuming males in B & D together.
 (a) 7 : 2 (b) 3 : 1 (c) 5 : 4 (d) 3 : 2 (e) 5 : 3

Directions (61-65): In the given below table graph details of candidates from 5 different cities is mentioned. Read carefully all the instructions and answer the following questions

City	Candidates appeared in online exam	Candidates appeared in offline exam	Candidates who did not complete exam (online+ offline)
A	440	45 %	105
B	320	36%	120
C	460	54 %	170
D	500	60 %	90
E	525	30%	140

Note: (total candidates=candidates appeared in online exam+ candidates appeared in offline exam)

61. Total number of candidates who completed the exam from City A is how much more/less than total number of candidates who completed the exam from City D?
 (a) 480 (b) 515 (c) 465 (d) 570 (e) 425
62. If number of candidates who didn't complete online exam and who didn't complete the offline exam from city D are equal, then number of candidates who completed offline exam from City D is approximately what percent more than number of candidates who completed online exam from same city?
 (a) 60 % (b) 55 % (c) 51 % (d) 46 % (e) 64 %
63. What is the difference between the total number of candidates who appeared in online and offline exams from all the cities together?
 (a) 180 (b) 190 (c) 175 (d) 200 (e) 210
64. Find the ratio of total number of candidates who appeared for online exams from City C and City D together to the total number of candidates who appeared for offline exams from City A and City B together?
 (a) 16: 9 (b) 16: 13 (c) 9: 16 (d) 11: 5 (e) 8: 9
65. Total candidates who appeared for offline exams from city A and City B together is what percentage of total candidates who appeared for online exams from city B?
 (a) 157.5 % (b) 160 % (c) 168.75 % (d) 172.5 % (e) 165 %

Directions (66-70) Table given below gives information about total no. of product sold by five companies, ratio of product sold in rural area to product sold in urban area by each company and also gives ratio of total mobile sold in rural area to total laptop sold in rural area by each company.

Company	Total product sold	Rural : urban (sold)	Mobile : laptop (sold in rural area)
MI	10010	5:6	8:5
LENOVO	77000	8:3	3:4
MICROSOFT	14300	15:7	22:30
HP	91000	6:7	33:19
APPLE	20020	4:3	67:76

66. In rural area, no. of mobile sold by MI is how much less than no. of laptop sold by Apple.
 (a) 5360 (b) 2560 (c) 2800 (d) 3280 (e) 6080

67. If 650 laptops for MICROSOFT are defected and after selling non-defective laptop company earns no profit no loss on total quantity. Find selling price of laptop was how much percent more than C.P.(for MICROSOFT ratio of mobile sold to laptop sold is 15:7)
 (a) $16\frac{2}{3}\%$ (b) $14\frac{2}{7}\%$ (c) 12% (d) 18% (e) $14\frac{1}{7}\%$
68. Find ratio of average no. of mobile sold by MI, MICROSOFT and APPLE in rural area to no. of product sold by LENOVO in urban area.
 (a) 39 : 200 (b) 39 : 193 (c) 13 : 85 (d) 200 : 39 (e) 193 : 39
69. Average no. of product sold by all companies is how much more or less than total product sold by HP in urban area.
 (a) 6543 less (b) 6534 more (c) 6354 more (d) 6534 less (e) 6543 more.
70. If ratio of mobile sold by MI to laptop sold by MI in urban area is 16 : 23, then find no. of laptop sold by APPLE in rural area is what part of laptop sold by MI in urban area.
 (a) $\frac{304}{261}$ (b) $\frac{261}{161}$ (c) $\frac{304}{161}$ (d) $\frac{161}{304}$ (e) $\frac{161}{261}$

Directions (71-75): Read the given below table carefully to answer the following questions.
 Table gives information of panchayat elections held in five villages (A, B, C, D and E).

Village	Total available votes (in'000)	Votes polled (in %)	Valid votes (in %)
A	50	70	80
B	40	75	60
C	75	80	75
D	100	75	72
E	80	90	70

Note- 1. Percentage of votes polled = $\frac{\text{Total votes polled}}{\text{Total available votes}} \times 100$

2. Percentage of valid votes = $\frac{\text{Total valid votes}}{\text{Total votes polled}} \times 100$

71. Find the ratio of invalid votes of village A to that of village D.
 (a) 3 : 5 (b) 1 : 3 (c) 6 : 7 (d) 4 : 5 (e) None of the above
72. Find the approximate difference between average of valid votes of village B and E and average of total votes polled in village A, B and D.
 (a) 13000 (b) 12900 (c) 12600 (d) 12500 (e) 12800
73. Invalid votes of village B & C together is what percent of total votes polled in village C & E together?
 (a) $20\frac{5}{11}\%$ (b) $24\frac{6}{11}\%$ (c) $21\frac{3}{11}\%$ (d) $19\frac{5}{11}\%$ (e) $23\frac{3}{11}\%$
74. Difference between valid votes and invalid votes of village E is approximately what percent of total votes available in village A?
 (a) 67% (b) 58% (c) 54% (d) 62% (e) 60%
75. Find the invalid votes in village C & D together is approximately what percent more or less than the invalid votes in village A, B & E together?
 (a) 17% (b) 21% (c) 7% (d) 14% (e) None of the above.

Directions (76-80): Given table shows the population of a colony in various age group at the end of five different years. No people since 2008 have left, come from outside and also no people have died during these years.

Age group	2014	2015	2016	2017	2018
0-5	30	29	31	32	33
6-20	25	27	29	28	27
21-35	28	26	32	33	32
36-50	22	23	20	20	23
51-65	20	22	24	26	27
≥66	35	36	40	42	47

76. Find the number of children who have taken birth in 2015?
 (a) 1 (b) 2 (c) 3 (d) 4 (e) Can't be determined
77. Find the number of children who have taken birth in 2012?
 (a) Can't be determined (b) 7 (c) 1
 (d) 11 (e) 13
78. Find the number of people increased in 2018 over the year 2015?
 (a) 26 (b) 22 (c) 34 (d) 30 (e) 28
79. Find number of people whose age group from 21-35 in 2015 is changed to age group of 36-50 in 2016?
 (a) 6 (b) 5 (c) 4 (d) Can't be determined (e) 3
80. Find the difference between number of people whose age is more than 20 years in 2017 and the number of people whose age is less than 51 years in 2018?
 (a) 5 (b) 6 (c) 7 (d) 8 (e) 9

Directions (81-84): Read the given information carefully and answer the following questions

The given table shows the production, export and per capita consumption of sugar in the town for five consecutive years.

Year	Production (million kg)	Export (million kg)	Per capital consumption (in kg)
2014	158	62	2.4
2015	175	68	2.5
2016	182	81	2.5
2017	208	94	2.4
2018	192	87	2.4

Note:- (i) There is no import in any year

(ii) Consumption = Production - Export

81. Find the average quantity of sugar consumed in the town over the given periods? (in million kg)
 (a) 104.6 (b) 103.8 (c) 105.2 (d) 104.9 (e) 104.8
82. In which of the following years was the percentage increase in the population over the previous year was the highest?
 (a) 2015 (b) 2016 (c) 2017 (d) 2018 (e) None of these
83. Find the ratio of population of town in 2015 to that in 2016?
 (a) 93 : 91 (b) 104 : 101 (c) 101 : 99 (d) 102 : 97 (e) None of these
84. Which of the following year has the maximum consumption of sugar?
 (a) 2014 (b) 2015 (c) 2016 (d) 2017 (e) 2018

Direction (85-89): The table given below shows number of three Novels of Chetan bhagat (Revolution 2020 + 2 States + The 3 Mistakes of my life) sold in five different book fairs. Total number of Revolution 2020 novel sold is given in absolute value and remaining two Novels (2 States + The 3 Mistakes of my life) are given in percentage out of total sold books. Study the table carefully and answer the given questions.

Book fairs	Total number of 'Revolution 2020'sold	% of 2 States and The 3 Mistakes of my life sold out of total sold novels	
		'2 States' sold	'The 3 Mistakes of my life' sold
Delhi book fair	1280	$37\frac{1}{2}\%$	$22\frac{1}{2}\%$
Kolkata book fair	840	50%	20%
Mumbai book fair	1440	38%	42%
Ahmedabad book fair	720	10%	30%
Bangalore book fair	960	32%	20%

- 85.** Total number of 'Revolution 2020' sold in Delhi and Mumbai book fairs together are sold either on 10% or on 15% discount in ratio 21 : 47 .Find ratio between total 'Revolution 2020' sold on 15% discount from both (Delhi and Mumbai) book fairs to total number of 'The 3 Mistakes of my life' sold in Ahmedabad and Bangalore book fairs together ?
 (a) 19 : 47 (b) 19 : 43 (c) 43 : 19 (d) 51 : 19 (e) 47 : 19
- 86.** Find the difference between average of total '2 States' sold from Mumbai and Ahmedabad book fairs and Average of total 'Revolution 2020' sold from Delhi and Kolkata book fairs?
 (a) 364 (b) 362 (c) 360 (d) 368 (e) 370
- 87.** Out of total 'Revolution 2020' sold in Delhi and Kolkata book fairs, ratio between old printed edition to new printed edition is 23 : 30. and total '2 States' sold in Mumbai and Bangalore book fairs, ratio between old printed edition to new printed edition is 3 : 5. Find the sum of old printed edition of 'Revolution 2020' sold in Delhi and Kolkata book fairs and old printed edition ' 2 States ' from Mumbai and Bangalore.?
 (a) 2186 (b) 3310 (c) 2258 (d) 3108 (e) 2560
- 88.** Find difference between total number of 'The 3 Mistakes of my life' sold in Delhi, Mumbai and Bangalore book fairs and total number of sold 'Revolution 2020' sold in Kolkata and Ahmedabad book fairs ?
 (a) 2584 (b) 2580 (c) 2588 (d) 2586 (e) 2582
- 89.** If 20% of total '2 States' novel sold in Kolkata book fair and 15% of the same sold in Bangalore book fair were purchased by female customers, then find number of '2 States' novel sold but not purchased by female customers in both given book fairs?
 (a) 1668 (b) 1670 (c) 1674 (d) 1672 (e) 1664

Directions (90-94): Table given below shows total number of votes cast in five cities. Total votes cast to X (in percentage) and total invalid votes cast. Only two people participate in the election (i.e., X and Y). Study the data carefully & answer the following questions.

City	Total votes cast	Votes cast to X (in %)	Total invalid votes cast
A	1200	45	135
B	1500	48	250
C	1350	60	250
D	1600	54	88
E	1950	44	144

Total votes cast = Votes cast to X + Votes cast to Y

Total votes cast = Total valid votes + Total invalid votes

- 90.** Total invalid votes cast to Y is 25% more than total invalid votes cast to X in city A. Find by how much percent Votes, Y won the elections in city A?
 (a) $22\frac{2}{9}\%$ (b) $21\frac{7}{8}\%$ (c) $21\frac{5}{8}\%$ (d) $22\frac{4}{9}\%$ (e) $22\frac{5}{9}\%$
- 91.** Find the average number of total votes cast to Y in city A, C and E together?
 (a) 736 (b) 748 (c) 764 (d) 754 (e) 760
- 92.** Total invalid votes cast to Y in city D and city E is 25% and 50% respectively. Then total valid votes cast to Y in city D is what percent of total valid votes cast to Y in city E.
 (a) 80% (b) 75% (c) 65% (d) 60% (e) 70%
- 93.** Total votes cast to X in city C and D together is what percent of the total votes cast to Y in city A and B together?
 (a) 110.25% (b) 112.75% (c) 114.25% (d) 116.25% (e) 118.25%
- 94.** Total valid votes cast to Y in city B is how much more than total valid votes cast to Y in city C if total invalid votes cast to X in city B and City C is 84% and 92% respectively.
 (a) 210 (b) 220 (c) 230 (d) 240 (e) 250

Directions (95-99): Given below is the table which shows the total number of mobiles sold in 5 different states, percentage of 16GB mobiles sold and number of 32GB mobiles sold.

State	Total number of Mobiles sold	Percentage of Mobiles sold of 16 GB	Mobiles sold of 32 GB
A	60,000	50%	15,000
B	80,000	40%	32,000
C	50,000	60%	12,000
D	90,000	45%	45,000
E	70,000	25%	14,000

Note: Total mobiles sold = mobiles of 16GB + mobiles of 32GB + mobiles of 64GB

- 95.** What is the difference between mobiles sold of 64GB in state B and E together and mobiles sold of 16GB in state A and D together?
 (a) 16,000 (b) 22,000 (c) 18,500 (d) 16,200 (e) None of these
- 96.** If $33\frac{1}{3}\%$ of 16GB mobiles sold in state A are defective and 25% percent of 64GB mobiles sold in state C are also defective. Then 64GB mobiles sold in state C which are defective are what percent of 16GB mobiles sold in state A which are not defective?
 (a) 10% (b) 20% (c) 15% (d) 25% (e) 30%
- 97.** Total mobiles sold of 16GB and 64GB together in state E is what percent more or less than total mobiles sold of same type in state together in state B?
 (a) $14\frac{2}{3}\%$ (b) $24\frac{2}{7}\%$ (c) $16\frac{2}{3}\%$ (d) $12\frac{1}{2}\%$ (e) $14\frac{2}{7}\%$
- 98.** What is the ratio of mobiles sold of 32GB in state A and B together to the mobiles sold of 16GB in state D and E together?
 (a) 58:47 (b) 31:58 (c) 43:58 (d) 47:58 (e) None of these
- 99.** What is the average of mobiles sold of 64GB in state A, C and E together?
 (a) 22,600 (b) 16,800 (c) 22,500 (d) 18,500 (e) 20,500

Direction (100-104): Study the table carefully & answer the following questions. Table given below shows the percentage of players who scored runs in each tournament.

Total number of Players = 600

Note → All the 600 players played all the matches in each tournament.

Runs	Tournament A	Tournament B	Tournament C
More than 60	25%	25%	20%
More than 40	35%	30%	30%
More than 20	80%	60%	70%

- 100.** Find the ratio between no. of players who scored more than 60 in tournament B to the no. of players who scored less than or equal to 20 in tournament B & C together?
 (a) 7 : 15 (b) 5 : 14 (c) 4 : 15 (d) 2 : 5 (e) 3 : 5
- 101.** No. of players who scored more than 40 in tournament A are how much more or less than total no. of players who scored less than or equal to 40 in tournament C?
 (a) 180 (b) 300 (c) 260 (d) 240 (e) 210
- 102.** No. of players who scored less than or equal to 40 in tournament B is what percent more or less than the no. of players who scored more than 60 in tournament A & B together?
 (a) 65% (b) 50% (c) 40% (d) 55% (e) 45%
- 103.** Find the average number of players in all three tournaments who scored more than 20?
 (a) 360 (b) 450 (c) 320 (d) 380 (e) 420
- 104.** What is total no. of players who scored more than 60 in all the three tournaments?
 (a) 420 (b) 540 (c) 560 (d) 480 (e) 470

Direction (105– 109): Given below table shows total employee of five companies prefer own vehicle for going office and percentage of employee prefer Metro & Bus for going office. Read the data carefully and answer the questions.

Companies	Number of employees prefer own vehicle	Percentage of employee prefer Metro	Percentage of employee prefer Bus
P	92	68%	24%
Q	39	60%	35%
R	192	55%	30%
S	91	70%	16%
T	110	72.5%	15%

Note: There is only these three mode of transport to reach office.

105. What is the difference between employees preferred metro from company S & T together to employees preferred bus from company T, P & S together?

- (a) 571 (b) 581 (c) 561 (d) 589 (e) 597

106. Find the average number of employee in P & S ?

- (a) 950 (b) 750 (c) 800 (d) 900 (e) 1050

107. If in an another company 'A' number of employee prefer metro is 25% more than number of employee prefer metro from Q and employee prefer metro from company 'A' is 45% of total employee in that company. Find the total number of employee in company T is what percent less than the total employee in company 'A'?

- (a) $32\frac{4}{13}\%$ (b) $34\frac{4}{13}\%$ (c) $38\frac{4}{13}\%$ (d) $42\frac{4}{13}\%$ (e) $36\frac{4}{123}\%$

108. Find the ratio between total employee prefer bus from company R and total employee prefer bus from company S?

- (a) 48 : 19 (b) 48 : 13 (c) 48 : 23 (d) 48 : 11 (e) 48 : 7

109. Find total number of employee prefer metro from P,Q and R ?

- (a) 1954 (b) 1855 (c) 1654 (d) 2014 (e) 1964

Directions (110-114): Given table shows the number of male and female students of six different universities and ratio of Graduate to Undergraduate among them.

Universities	Total Male Student	Graduate Male : Undergraduate Male	Total Female Student	Graduate Female: Undergraduate Female
P	1820	3:4	3120	5:3
Q	5005	5:2	3003	6:1
R	3080	7:4	3640	9:4
S	4650	8:7	5850	5:4
T	3990	10:9	1950	2:3
U	3750	1:2	4740	2:1

110. Total number of Graduate of University P is how much more than the total number of undergraduate of University Q.

- (a) 871 (b) 671 (c) 971 (d) 571 (e) 771

111. Number of undergraduate females of university U is what percent more/less than the graduate male of same university.

- (a) 20.4% (b) 22.4% (c) 26.4% (d) 30.4% (e) 36.2%

112. Find the ratio between graduate student of university R to that of University T.

- (a) 8 : 5 (b) 7 : 5 (c) 14 : 9 (d) 14 : 11 (e) None of these.

113. What is the average number of the male graduates from P, R and S together?

- (a) 1700 (b) 1710 (c) 1720 (d) 1730 (e) 1740

114. If a male graduate is to be chosen from the university S, then find the probability for the same.

- (a) $\frac{124}{525}$ (b) $\frac{5}{21}$ (c) $\frac{129}{525}$ (d) $\frac{6}{25}$ (e) $\frac{131}{525}$

Directions (115-120): The given table shows the list of different items produced by five different companies. Read the table carefully and answer the given questions.

Products Company	TV	AC	Fridge	Cooler
A	2624	3545	2119	1215
B	3850	3265	3065	1820
C	4839	3158	1258	1745
D	2690	2132	2028	1250
E	3750	2530	3000	1675

- 115.** Find the ratio between number of TV produced by companies B and D together to the number of AC produced by companies A and B together.
 (a) 217 : 227 (b) 218 : 227 (c) 227 : 217 (d) 215 : 227 (e) 227 : 218
- 116.** Find the average number of total fridge produced by all the companies together?
 (a) 2294 (b) 2284 (c) 2304 (d) 2290 (e) 2324
- 117.** If 40% of TV produced by company E remains unsold and 40% of the cooler produced by company B has been sold. Find the number of cooler produced by company B that remains unsold is what percent of number of TV produced by company E that remains unsold?
 (a) 96% (b) 92% (c) 86.8% (d) 72.8% (e) 82.4%
- 118.** Find the difference between total number of products produced by company C and the total number of products produced by company B.
 (a) 1,100 (b) 1,000 (c) 950 (d) 1,050 (e) 1,150
- 119.** Total number of TV produced by company B and cooler produced by company D together is what percent more or less than total number of fridge produced by company E?
 (a) 60% (b) 50% (c) 80% (d) 55% (e) 70%
- 120.** Which company has produced the maximum number of products per month.
 (a) B (b) D (c) A (d) C (e) E

Practice MCQs for Prelims_(Solutions)

- (a):** total students in a section = students failed in both + students passed in half yearly + students passes in annual – students passed in both total students in section B = $15 + 30 + 25 - 20 = 50$
- (d):** students failed in both exams in all sections = $10 + 15 + 20 = 45$
 Students passed in both exams in all sections = $20 + 20 + 25 = 65$
 Required % = $\frac{65-45}{45} \times 100 = 44\frac{4}{9}\%$
- (c):** students passed in only one examination in all sections = $(30 + 40 - 20) + (30 + 25 - 20) + (35 + 30 - 25) = 125$
 Required average = $\frac{125}{3} = 41.67$
- (e):** Total students in section C = $20 + 35 + 30 - 25 = 60$
 Required % = $\frac{20}{60} \times 100 = 33.33\%$
- (b):** students in section A = $10 + 30 + 40 - 20 = 60$
 Students in section B = $15 + 30 + 25 - 20 = 50$
 Students in section C = $20 + 35 + 30 - 25 = 60$
 Section A & C have same no. of students
- (b):** Items purchased by females from store A on Wednesday and Thursday together
 $= 335 \times \frac{40}{100} + 360 \times \frac{60}{100}$
 $= 350$
 total items purchased by males from store B on Thursday and Friday together
 $= 380 \times \frac{75}{100} + 275 \times \frac{60}{100}$
 $= 450$
 Required percentage = $\frac{450-350}{450} \times 100$
 $= 22\frac{2}{9}\%$
- (d):** total number of items purchased by males from store A on Tuesday and Wednesday together
 $= 280 \times \frac{55}{100} + 335 \times \frac{60}{100} = 355$

total numbers of items purchased by females from store B on Thursday and Friday together
 $= 380 \times \frac{25}{100} + 275 \times \frac{40}{100} = 205$
 Required ratio $= \frac{355}{205} = 71:41$

8. (e): Total number of items purchased by males from store B on all the given days together
 $= 320 \times \frac{70}{100} + 440 \times \frac{35}{100} + 270 \times \frac{20}{100} + 380 \times \frac{75}{100} + 275 \times \frac{60}{100}$
 $= 224 + 154 + 54 + 285 + 165 = 882$

9. (c): Total Items purchased on Thursday and Friday together of store A $= 360 + 420 = 780$
 Total items purchased on Wednesday and Thursday together of store B $= 270 + 380 = 650$
 Required percentage $= \frac{780}{650} \times 100 = 120\%$

10. (b): Total items purchased from store A on Saturday
 $= 335 \times \frac{120}{100} = 402$
 Total items purchased from store B on Saturday
 $= 270 \times \frac{130}{100} = 351$
 Total items purchased from Store A and Store B together on Saturday $= 402 + 351 = 753$

11. (c): Total no. of magazines distributed by companies Q, R and T among their distributors
 $= 2400 \times \frac{60}{100} + 3800 \times \frac{75}{100} + 4500 \times \frac{70}{100}$
 $= 1440 + 2850 + 3150$
 $= 7440$
 Required average $= \frac{7440}{3} = 2480$

12. (d): Total number of distributors of magazines of company Q $= \frac{2400 \times \frac{60}{100}}{40} = 36$
 Total number of distributors of magazines of company T $= \frac{4500 \times \frac{70}{100}}{75} = 42$
 Total number of distributors of magazines of company Q and T together $= 36 + 42 = 78$

13. (b): total number of magazines distributed among the distributors of company R $= 3800 \times \frac{75}{100} = 2850$
 total number of magazines distributed among the distributors of company T $= 4500 \times \frac{70}{100} = 3150$
 Required ratio $= \frac{2850}{3150} = 19:21$

14. (e): Total number of magazines distributed among the distributors of company P $= 5600 \times \frac{80}{100} = 4480$
 Total number of magazines distributed among the distributors of company Q $= 2400 \times \frac{60}{100} = 1440$

Total number of magazines distributed among the distributors of company R $= 3800 \times \frac{75}{100} = 2850$

Total number of magazines distributed among the distributors of company S $= 2500 \times \frac{68}{100} = 1700$

Total number of magazines distributed among the distributors of company T $= 4500 \times \frac{70}{100} = 3150$

Required average $= \frac{4480 + 1440 + 2850 + 1700 + 3150}{5} = 2724$

15. (b): Total no. of distributors of magazines sold by companies P and Q together

$$= \frac{5600 \times \frac{80}{100}}{64} + \frac{2400 \times \frac{60}{100}}{40} = 70 + 36 = 106$$

Total no. of distributors of magazines sold by companies R and T together

$$= \frac{3800 \times \frac{75}{100}}{95} + \frac{4500 \times \frac{70}{100}}{75} = 30 + 42 = 72$$

Required difference $= 106 - 72 = 34$

16. (c): Boys in school - A & E together $= \frac{720}{9} \times 11 +$

$$350 \times \frac{8}{7} = 880 + 400 = 1280$$

Boys in school - B & C together $= 540 \times \frac{3}{2} +$

$$270 \times \frac{7}{3} = 810 + 630 = 1440$$

$$\text{Required ratio} = \frac{1280}{1440}$$

$$= \frac{8}{9} = 8:9$$

17. (e): Average number of girls in school - B, C & D =

$$\frac{540 + 270 + 576}{3} = 462$$

Average number of students in school - A & D =

$$\frac{1}{2} \left[720 \times \frac{20}{9} + 576 \times \frac{25}{12} \right] = \frac{1}{2} [1600 + 1200] = 1400$$

$$\text{Required } \% = \frac{462}{1400} \times 100 = 33\%$$

18. (d): Students in school - B $= 540 \times \frac{5}{2}$

$$= 1350$$

Girls in school - E and boys in school - D together

$$= 350 + 576 \times \frac{13}{12} = 350 + 624 = 974$$

Required difference $= 1350 - 974 = 376$

$$\begin{aligned}
 19. (d): \text{Students in school - C \& E together} &= \left[270 \times \frac{10}{3} + 350 \times \frac{15}{7} \right] \\
 &= 900 + 750 \\
 &= 1650 \\
 \text{Required \%} &= \frac{1650 - 720}{720} \times 100 \\
 &= \frac{930}{720} \times 100 \\
 &= \frac{775}{6} \% \\
 &= 129\frac{1}{6} \%
 \end{aligned}$$

$$\begin{aligned}
 20. (a): \text{Girls in school - A \& D together} &= 720 + 576 = 1296 \\
 \text{Boys in school - A \& E together} &= 720 \times \frac{11}{9} + 350 \times \frac{8}{7} \\
 &= 880 + 400 \\
 &= 1280 \\
 \text{Required \%} &= \frac{1296}{1280} \times 100 \\
 &= \frac{405}{4} \% = 101\frac{1}{4} \%
 \end{aligned}$$

$$\begin{aligned}
 21. (a): \text{Required \%} &= \frac{4800 - 3200}{3200} \times 100 \\
 &= \frac{1600}{3200} \times 100 = 50\%
 \end{aligned}$$

$$\begin{aligned}
 22. (d): \text{Let female population in 2013} &= x \\
 \text{Male population in 2013} &= \frac{4}{3}x \\
 \text{Total population} &= \frac{4}{3}x + x = 2800 \\
 x &= \frac{2800 \times 3}{7} = 1200 \\
 \text{Required difference} &= (2800 - 1200) - 1200 \\
 &= 400
 \end{aligned}$$

$$23. (b): \text{Required difference} = \frac{(7-5)}{16} \times 4000 = 500$$

$$\begin{aligned}
 24. (a): \text{Average population of city Y} &= \frac{15400}{5} = 3080 \\
 \text{Average population of city X} &= \frac{14000}{5} = 2800 \\
 \text{Required difference} &= 3080 - 2800 = 280
 \end{aligned}$$

$$\begin{aligned}
 25. (c): \text{Population of city X in 2015} &= \frac{125}{100} \times 3200 = 4000 \\
 \text{Population of city Y in 2015} &= \frac{10}{9} \times 3600 = 4000 \\
 \text{Total population in 2015} &= 4000 + 4000 = 8000
 \end{aligned}$$

$$\begin{aligned}
 26. (a): \text{No. of buses in city A} &= \frac{6000}{4} \times 1 = 1500 \\
 \text{No. of buses in city B} &= \frac{9000}{3} \times 2 = 6000 \\
 \text{No. of buses in city C} &= \frac{8000}{5} \times 3 = 4800 \\
 \text{Req. difference} &= \left(\frac{4800 + 6000}{2} \right) - \left(\frac{1500 + 6000}{2} \right) = 1650
 \end{aligned}$$

$$\begin{aligned}
 27. (b): \text{No. of four wheelers in city A} &= 6000 + \frac{6000}{4} \times 1 = 7500 \\
 \text{No. of two wheelers in city C} &= 8000 \times \frac{150}{100} \\
 &= 12000 \\
 \text{Required ratio} &= \frac{7500}{12000} = \frac{5}{8}
 \end{aligned}$$

$$\begin{aligned}
 28. (c): \text{Required \%} &= \frac{9000}{\left(\frac{9000}{3} \times 5 + 9000 \times \frac{110}{100} \right)} \times 100 \\
 &= \frac{9000}{9000 \left(\frac{5}{3} + \frac{11}{10} \right)} \times 100 \\
 &= \frac{30}{83} \times 100 \approx 36\%
 \end{aligned}$$

$$\begin{aligned}
 29. (d): \text{No. of buses in city C (after addition)} &= \frac{8000}{5} \times 3 + 200 \\
 &= 5000 \\
 \text{Total no. of vehicles in city C} &= 8000 + 5000 + 8000 \times \frac{150}{100} \\
 &= 13000 + 12000 \\
 &= 25000 \\
 \text{Required \%} &= \frac{5000}{25000} \times 100 = 20\%
 \end{aligned}$$

$$\begin{aligned}
 30. (c): \text{No. of two-wheelers in cities A and C} &= 6000 \times \frac{120}{100} + 8000 \times \frac{150}{100} \\
 &= 7200 + 12000 \\
 &= 19200 \\
 \text{No. of four-wheelers in cities B and C} &= \frac{9000}{3} \times 5 + \frac{8000}{5} \times 8 \\
 &= 15000 + 12800 = 27800 \\
 \text{Required difference} &= 27800 - 19200 = 8600
 \end{aligned}$$

31. (c): from the table it is clear that the no. of failed students are maximum in year 2018.

$$\begin{aligned}
 32. (b): \text{required average} &= \frac{400000 \times \frac{12}{100} + 690000 \times \frac{15}{100} + 750000 \times \frac{13}{100}}{3} \\
 &= \frac{480000 + 1035000 + 975000}{3} = 83,000
 \end{aligned}$$

$$\begin{aligned}
 33. (a): \text{required percentage} &= \frac{400000 \times \frac{12}{100} - 840000 \times \frac{5}{100}}{400000 \times \frac{12}{100}} \times 100 \\
 &= 12.5\%
 \end{aligned}$$

$$\begin{aligned}
 34. (e): \text{no. of students appeared in Chandigarh Zone in 2018} &= 520000 \times \frac{6}{100} + 400000 \times \frac{80}{100} \\
 &= 351200
 \end{aligned}$$

$$\begin{aligned}
 35. (d): \text{Required ratio} &= \frac{640000 \times \frac{20}{100}}{400000 \times \frac{88}{100}} = \frac{128000}{352000} \\
 &= 4 : 11
 \end{aligned}$$

$$\begin{aligned}
 36. (c): \text{Total marks scored by lokesh in physics, chemistry and maths together} &= 150 \times \frac{80}{100} + 150 \times \frac{76}{100} + 150 \times \frac{84}{100} \\
 &= 120 + 114 + 126 \\
 &= 360 \\
 \text{Total marks scored by Amit in physics, chemistry and maths together} &= 150 \times \frac{70}{100} + 150 \times \frac{66}{100} + 150 \times \frac{58}{100} \\
 &= 105 + 99 + 87 = 291 \\
 \text{Required difference} &= 360 - 291 = 69
 \end{aligned}$$

37. (d): Total marks scored by Siddharth in all the subjects = $150 \times \frac{48}{100} + 150 \times \frac{72}{100} + 150 \times \frac{88}{100} + 100 \times \frac{70}{100} + 100 \times \frac{86}{100}$
 $= 72 + 108 + 132 + 70 + 86$
 $= 468$

overall percentage marks scored by Siddharth = $\frac{468}{650} \times 100 = 72\%$

38. (a): Total marks scored by Ritesh in all the subjects = $150 \times \frac{76}{100} + 150 \times \frac{82}{100} + 150 \times \frac{64}{100} + 100 \times \frac{72}{100} + 100 \times \frac{94}{100}$
 $= 114 + 123 + 96 + 72 + 94$
 $= 499$

Total marks scored by Aakash in all the subjects = $150 \times \frac{50}{100} + 150 \times \frac{64}{100} + 150 \times \frac{78}{100} + 100 \times \frac{65}{100} + 100 \times \frac{75}{100}$
 $= 75 + 96 + 117 + 65 + 75$
 $= 428$

Required difference = $499 - 428 = 71$

39. (c): marks scored in physics subject by all the given five students together = $150 \times \frac{66}{100} + 150 \times \frac{64}{100} + 150 \times \frac{72}{100} + 150 \times \frac{76}{100} + 150 \times \frac{82}{100}$
 $= 99 + 96 + 108 + 114 + 123$
 $= 540$

Average marks scored in physics = $\frac{540}{5} = 108$

40. (b): Total marks scored by Aakash, Siddharth and Lokesh in English = $100 \times \frac{65}{100} + 100 \times \frac{70}{100} + 100 \times \frac{75}{100}$
 $= 65 + 70 + 75$
 $= 210$

Total marks scored by Amit, Aakash and Lokesh in maths = $150 \times \frac{70}{100} + 150 \times \frac{50}{100} + 150 \times \frac{80}{100}$
 $= 105 + 75 + 120$
 $= 300$

Required percentage = $\frac{210}{300} \times 100$
 $= 70\%$

41. (b): Total items B sold by store on Monday and Friday together = $\frac{240}{48} \times 32 + \frac{340}{68} \times 22$
 $= 160 + 110$
 $= 270$

Total items C sold by store in Wednesday & Thursday together = $\frac{420}{35} \times 20 + \frac{360}{24} \times 20$
 $= 240 + 300$
 $= 540$

Required percentage = $\frac{540 - 270}{540} \times 100$
 $= \frac{270}{540} \times 100$
 $= 50\%$

42. (c): Average number of items B sold by store on Tuesday & Thursday

$= \frac{\frac{320}{40} \times 48 + \frac{360}{24} \times 56}{2}$
 $= \frac{384 + 840}{2}$
 $= 612$

Average number of items A sold by store on Thursday & Friday

$= \frac{\frac{360}{40} \times 340}{2}$
 $= \frac{700}{2}$
 $= 350$

Required difference = $612 - 350 = 262$

43. (a): Total items B sold by store on Sunday

$= \frac{360}{24} \times 56 \times \frac{125}{100}$
 $= 1050$

Total items C sold by store on Sunday

$= \frac{340}{68} \times 10 \times \frac{400}{100}$
 $= 200$

Total items B & items C sold by store on Sunday = $1050 + 200 = 1250$

44. (c): Total items C sold on Wednesday = $\frac{420}{35} \times 20$
 $= 240$

Total items C sold on Monday & Tuesday together

$= \frac{240}{48} \times 20 + \frac{320}{40} \times 12$
 $= 100 + 96$
 $= 196$

Required percentage = $\frac{240 - 196}{196} \times 100$
 $= \frac{44}{196} \times 100$
 $= 22\frac{22}{49}\%$

45. (b): Required ratio = $\frac{\frac{240}{48} \times 100}{\frac{360}{24} \times 100}$
 $= \frac{500}{1500} = 1 : 3$

46. (b): Total stock of plant C in 2002

$= 960 \times \frac{125}{100} + \left(960 - 960 \times \frac{50}{100}\right)$
 $= 1680$

Total stock of plant E in 2002

$= 1200 \times \frac{120}{100} + \left(1200 - 1200 \times \frac{60}{100}\right)$
 $= 1920$

Required percent = $\frac{1920 - 1680}{1920} \times 100$
 $= \frac{240}{1920} \times 100 = 12.5\%$

- 47. (d):** Total stock of plant A in 2002
 $= 900 \times \frac{112}{100} + \left(900 - 900 \times \frac{35}{100}\right)$
 $= 1593$
 Average of unsold mobiles by plant D & E in 2001
 $= \frac{1080 \times \frac{60}{100} + 1200 \times \frac{40}{100}}{2} = \frac{1128}{2} = 564$
 Required difference = $1593 - 564 = 1029$
- 48. (a):** Total 8GB mobiles manufactured by plant B in 2001 = $720 \times \frac{55}{100} = 396$
 Total unsold 8GB mobiles of plant B in 2001 = $396 - 720 \times \frac{5}{8} \times \frac{64}{100}$
 $= 396 - 288 = 108$
 Total stock of plant D in 2002 = $1080 \times \frac{112.5}{100} + \left(1080 - 1080 \times \frac{40}{100}\right)$
 $= 1863$
 Required ratio = $\frac{108}{1863}$
 $= 4 : 69$
- 49. (e):** Total stock of plant B in the year 2001
 $= 720 \times \frac{115}{100} + \left(720 - 720 \times \frac{5}{8}\right)$
 $= 1098$
 Total unsold mobiles of plant B & E together in 2016 = $720 \times \frac{3}{8} + 1200 \times \frac{40}{100}$
 $= 270 + 480 = 750$
 Required percentage = $\frac{1098 - 750}{750} \times 100$
 $= \frac{348}{750} \times 100 = 46.4\%$
- 50. (c):** Total stock of plant A in 2002
 $= 900 \times \frac{112}{100} + \left(900 - 900 \times \frac{35}{100}\right) = 1593$
 Total stock of plant D in 2002 = $1080 \times \frac{112.5}{100} + \left(1080 - 1080 \times \frac{40}{100}\right)$
 $= 1863$
 Total unsold mobiles of plant A & D together in 2002
 $= \left(1593 - 900 \times \frac{35}{100} \times \frac{120}{100}\right) + \left(1863 - 1080 \times \frac{40}{100} \times \frac{125}{100}\right)$
 $= 1215 + 1323$
 $= 2538$
- 51. (a):** Let total students from A = 100a
 And, let total students from E = 100b
 ATQ –
 Total passed students in A = 60a
 $60a \times \frac{7}{12} - 60a \times \frac{5}{12} = 80$
 $35a - 25a = 80$
 $10a = 80$
 $a = 8$

$$\begin{aligned} \text{Total failed girls from A} &= 800 \times \frac{40}{100} \times \frac{3}{8} = 120 \\ \text{Total passed students from E} &= 75b \\ 75b \times \frac{8}{15} - 75b \times \frac{7}{15} &= 50 \\ 40b - 35b &= 50 \\ 5b &= 50 \\ b &= 10 \\ \text{Total failed girls from E} &= 1000 \times \frac{25}{100} \times \frac{2}{5} = 100 \\ \text{Required sum} &= 120 + 100 = 220 \end{aligned}$$

- 52. (c):** Let total students from B = x
 And, let total students from C = y
 ATQ –
 $x \times \frac{30}{100} : y \times \frac{35}{100} = 9 : 7$
 $x = 1.5y$
 Given, $1.5y \times \frac{70}{100} + y \times \frac{65}{100} = 1020$
 $170y = 102000$
 $y = 600$
 And, $x = 1.5 \times 600 = 900$
 Required sum = $600 + 900 = 1500$
- 53. (e):** Let total students from D = 100x
 So, total passed students from D = 80x
 ATQ –
 $80x \times \frac{5}{8} - 80x \times \frac{3}{8} = 100$
 $20x = 100$
 $x = 5$
 Total students from D = 500
 Total failed students from E
 $= 500 \times \frac{20}{100} \times \frac{250}{100} = 250$
 Total students from E = $250 \times \frac{100}{25} = 1000$
 Required ratio = $500 : 1000 = 1 : 2$
- 54. (b):** Let total students from A = 100a
 And, total passed students from A = 60a
 ATQ –
 Total passed students from E
 $= 60a \times \frac{156.25}{100} = 93.75a$
 Total students from E = $93.75a \times \frac{100}{75} = 125a$
 Total failed students from E
 $= 125a \times \frac{25}{100} = 31.25a$
 Required percentage = $\frac{40a - 31.25a}{31.25a} \times 100$
 $= \frac{8.75a}{31.25a} \times 100 = 28\%$
- 55. (c):** Let total students from A = 100a
 So, total students from C = 75a
 ATQ –
 $100a \times \frac{40}{100} + 75a \times \frac{35}{100} = 530$
 $40a + 26.25a = 530$
 $a = 8$

$$\text{Total passed boys from A} = 800 \times \frac{60}{100} \times \frac{5}{12} = 200$$

Total passed boys from C

$$= 75 \times 8 \times \frac{65}{100} \times \frac{6}{13} = 180$$

$$\text{Required average} = \frac{200+180}{2} = 190$$

56. (c): Average female tea consumers in A, C & E
 $= \frac{300+800+1000}{3} = 700$

Male coffee consumers in B & D together

$$= 500 + 1500 = 2000$$

$$\text{Required \%} = \frac{2000-700}{2000} \times 100 = 65\%$$

57. (a): Let green tea consumers in D be $2x$.

So, black tea consumers in D = $2x \times \frac{150}{100}$

$$= 3x$$

ATQ,

$$2x + 3x = 600 + 900$$

$$\Rightarrow x = 300$$

Now, black tea consumed by females and green tea consuming males together in D = $3 \times 300 \times \frac{7}{15} + 2 \times 300 \times \frac{1}{5}$

$$= 420 + 120$$

$$= 540$$

Tea consuming females in A & C together = $300 + 800$

$$= 1100$$

$$\text{Required difference} = 1100 - 540$$

$$= 560$$

58. (e): Male tea consumers in C, D & E together = $1000 + 600 + 400$
 $= 2000$

Female coffee consumers in A & B together = $600 + 1000$

$$= 1600$$

$$\text{Required \%} = \frac{2000}{1600} \times 100$$

$$= 125\%$$

59. (b): Coffee consumers in F = $\frac{120}{100} \times 1500$

$$= 1800$$

Tea consumers in F = $1800 \times \frac{5}{9}$

$$= 1000$$

Tea and coffee consuming males in F together =

$$1000 \times \frac{3}{5} + 1800 \times \frac{7}{10}$$

$$= 600 + 1260$$

$$= 1860$$

60. (d): Coffee consuming females in C & E together
 $= 1500 + 1200$

$$= 2700$$

Tea consuming males in B & D together = $1200 + 600$

$$= 1800$$

$$\text{Required ratio} = \frac{2700}{1800} = 3 : 2$$

61. (c): Total candidates from City A = $\frac{440}{55} \times 100 = 800$

Total candidates who completed exam from A
 $= 800 - 105 = 695$

Total candidates from City D = $\frac{500}{40} \times 100 = 1250$

Total candidates who completed exam from D
 $= 1250 - 90 = 1160$

$$\text{Required difference} = 1160 - 695 = 465$$

62. (b): Candidate who didn't completed online and offline exams from city D are equal

Candidate who didn't completed online exams from city D = 45

Candidate who didn't completed offline exams from city D = 45

Candidate who completed online exams from city D = $500 - 45 = 455$

Candidate who completed offline exams from city D = $750 - 45 = 705$

$$\text{Required percentage} = \frac{705-455}{455} \times 100 \approx 55\%$$

$$= 55\% \text{ (approx.)}$$

63. (b): Total candidate who appeared in online exams in all cities = $440 + 320 + 460 + 500 + 525 = 2245$

Total candidate who appeared in offline exams in all

$$\text{cities} = \left(\frac{440}{55} \times 45\right) + \left(\frac{320}{64} \times 36\right) + \left(\frac{460}{46} \times 54\right) + \left(\frac{500}{40} \times 60\right) + \left(\frac{525}{70} \times 30\right)$$

$$= 360 + 180 + 540 + 750 + 225 = 2055$$

$$\text{Required difference} = 2245 - 2055 = 190$$

64. (a): Total candidate who appeared in online exams in city C and city D together = $460 + 500 = 960$

Total candidate who appeared in offline exams in city A and city B together = $\frac{440}{55} \times 45 + \frac{320}{64} \times 36 = 360 + 180 = 540$

$$\text{Required ratio} = \frac{960}{540} = \frac{16}{9}$$

65. (c): Total candidate who appeared in offline exams in city A and city B together = $\frac{440}{55} \times 45 + \frac{320}{64} \times 36 = 360 + 180 = 540$

Total candidate who appeared in online exams in city B = 320

$$\text{Required percentage} = \frac{540}{320} \times 100 = 168.75\%$$

66. (d): No. of mobile sold by MI in rural area = $10010 \times \frac{5}{11} \times \frac{8}{13} = 2800$

No. of laptop sold by APPLE in rural area

$$= 20020 \times \frac{4}{7} \times \frac{76}{143} = 6080$$

$$\text{Required difference} = 6080 - 2800 = 3280$$

67. (a): Total laptop sold by MICROSOFT

$$= 14300 \times \frac{7}{22} = 4550$$

Non-defective laptop = $4550 - 650 = 3900$

Hence, selling price of 3900 laptop is equal to cost price of 4550 laptop

$$\text{Required percentage} = \frac{650}{3900} \times 100 = 16\frac{2}{3}\%$$

68. (a): Average no. of mobile sold by MI, MICROSOFT and APPLE in rural area =

$$\frac{10010 \times \frac{5}{11} \times \frac{8}{13} + 14300 \times \frac{15}{22} \times \frac{22}{52} + 20020 \times \frac{4}{7} \times \frac{67}{143}}{3} = 4095$$

$$\text{Required ratio} = \frac{4095}{77000 \times \frac{3}{11}} = \frac{39}{200}$$

$$\Rightarrow 39 : 200$$

69. (d): Average no. of product sold by all companies

$$\Rightarrow \frac{10010 + 77000 + 14300 + 91000 + 20020}{5} = 42466$$

Total product sold by HP in urban area

$$= 91000 \times \frac{7}{13} = 49000$$

$$\text{Required difference} = 49000 - 42466 = 6534 \text{ less}$$

70. (c): Required part = $\frac{20020 \times \frac{4}{7} \times \frac{76}{143}}{10010 \times \frac{6}{11} \times \frac{23}{39}} = \frac{304}{161}$

71. (b): Invalid votes of village A

$$= 50000 \times \frac{70}{100} \times \frac{20}{100} = 7000$$

Invalid votes of village D

$$= 100000 \times \frac{75}{100} \times \frac{28}{100} = 21000$$

$$\text{So, required ratio} = \frac{7000}{21000} = \frac{1}{3} = 1 : 3$$

72. (d): Total valid votes of village B and E together

$$= 40000 \times \frac{75}{100} \times \frac{60}{100} + 80000 \times \frac{90}{100} \times \frac{70}{100}$$

$$= 18000 + 50400 = 68400$$

Total votes polled in village A, B & D together

$$= 50000 \times \frac{70}{100} + 40000 \times \frac{75}{100} + 100000 \times \frac{75}{100}$$

$$= 35000 + 30000 + 75000 = 140000$$

Required difference

$$= \frac{140000}{3} - \frac{68400}{2} = \frac{280000 - 205200}{6} = \frac{74800}{6}$$

$$= 12466.67 = 12500 \text{ (approx.)}$$

73. (a): Invalid votes of village B & C together = $40000 \times$

$$\frac{75}{100} \times \frac{40}{100} + 75000 \times \frac{80}{100} \times \frac{25}{100}$$

$$= 12000 + 15000 = 27000$$

Total votes polled in village C & E together =

$$75000 \times \frac{80}{100} + 80000 \times \frac{90}{100}$$

$$= 60000 + 72000 = 132000$$

$$\text{Required \%} = \frac{27000}{132000} \times 100 = \frac{225}{11}\%$$

$$= 20\frac{5}{11}\%$$

74. (b): Valid votes of village E

$$= 80000 \times \frac{90}{100} \times \frac{70}{100} = 50400$$

Invalid votes of village E

$$= 80000 \times \frac{90}{100} \times \frac{30}{100} = 21600$$

$$\text{Required \%} = \frac{(50400 - 21600)}{50000} \times 100 = \frac{28800}{500}\%$$

$$= 57.6\% = 58\% \text{ (approx.)}$$

75. (e): Invalid votes in village C & D together = $75000 \times$

$$\frac{80}{100} \times \frac{25}{100} + 100000 \times \frac{75}{100} \times \frac{28}{100}$$

$$= 15000 + 21000 = 36000$$

Invalid votes in village A, B & E together

$$= 50000 \times \frac{70}{100} \times \frac{20}{100} + 40000 \times \frac{75}{100} \times \frac{40}{100}$$

$$+ 80000 \times \frac{90}{100} \times \frac{30}{100}$$

$$= 7000 + 12000 + 21600 = 40600$$

$$\text{Required \%} = \frac{40600 - 36000}{40600} \times 100$$

$$= \frac{4600}{40600} \times 100 = 11.33\% = 11\% \text{ (approx.)}$$

76. (c): Required number of births in 2015

$$= \{(29+27+26+23+22+36) -$$

$$(30+25+28+22+20+35)\} = 3$$

77. (b): Number of births in 2018 = $189 - 181 = 8$

Number of children born in 2012 is of 5 years in 2017 and will be of 6 years in 2018

So required number of births that happened in 2012

$$= 32 + 8 - 33 = 7$$

78. (a): Required increased number of people = $189 - 163$

$$= 26$$

79. (e): Number of births in 2016 = $176 - 163 = 13$

Number of people whose age group from 0-5 in 2015 is changed to age group of 6-20 in 2016 = $29 + 13 - 31 = 11$

Number of people whose age group from 6-20 in 2015 is changed to age group of 21-35 in 2016 = $11 + 27 - 29 = 9$

Number of people whose age group from 21-35 in 2015 is changed to age group of 36-50 in 2016 = $9 + 26 - 32 = 3$

80. (b): Number of people whose age is more than 20 years in 2017 = $33 + 20 + 26 + 42 = 121$

Number of people whose age is less than 51 years in 2018 = $33 + 27 + 32 + 23 = 115$

$$\text{Required difference} = 6$$

81. (a): Required average

$$= \frac{(158-62) + (175-68) + (182-81) + (208-94) + (192-87)}{5}$$

$$= 104.6 \text{ million kg}$$

82. (c): Population in 2014 = $\frac{96}{2.4} = 40$ million
 Population in 2015 = $\frac{107}{2.5} = 42.8$ million
 Population in 2016 = $\frac{101}{2.5} = 40.4$ million
 Population in 2017 = $\frac{114}{2.4} = 47.5$ million
 Population in 2018 = $\frac{105}{2.4} = 43.75$ million
 Clearly, percentage increase in population of 2017 over the previous year was the highest.

83. (e): Population in 2015 = $\frac{107}{2.5} = 42.8$ million
 Population in 2016 = $\frac{101}{2.5} = 40.4$ million
 Required ratio = $\frac{42.8}{40.4} = \frac{107}{101}$

84. (d): Consumption in 2014 = 158 - 62 = 96 million kg
 Consumption in 2015 = 175 - 68 = 107 million kg
 Consumption in 2016 = 182 - 81 = 101 million kg
 Consumption in 2017 = 208 - 94 = 114 million kg
 Consumption in 2018 = 192 - 87 = 105 million kg

85. (e): Total number of 'Revolution 2020' sold on 15% discount in Delhi and Mumbai book fairs together = $(1280 + 1440) \times \frac{47}{68} = 1880$
 Total number of sold 'The 3 mistakes of my life' sold in Ahmedabad and Bangalore = $\frac{720}{[100 - (10 + 30)]} \times 30 + \frac{960}{[100 - (32 + 20)]} \times 20 = 360 + 400 = 760$
 Required ratio = $\frac{1880}{760} = 47 : 19$

86. (d): Average number of '2 states' sold in Mumbai and Ahmedabad book fairs = $\frac{\frac{1440 \times 38 + 720 \times 10}{20}}{2} = \frac{2736 + 120}{2} = \frac{2856}{2} = 1428$
 Average number of 'Revolution 2020' sold in Delhi and Kolkata book fairs = $\frac{1280 + 840}{2} = \frac{2120}{2} = 1060$
 Required difference = 1428 - 1060 = 368

87. (a): Total old printed edition of novel 'Revolution 2020' from Delhi, Kolkata and old printed of '2 states' sold in, Mumbai and Bangalore book fairs.
 $= (1280 + 840) \times \frac{23}{53} + \left(\frac{1440}{20} \times 38 + \frac{960}{48} \times 32 \right) \times \frac{3}{8}$
 $= 920 + (2736 + 640) \times \frac{3}{8}$
 $= 920 + 1266 = 2186$

88. (a): Total number of 'The 3 Mistakes of my life' sold in Delhi, Mumbai, and Bangalore book fairs
 $= \frac{1280}{40} \times 22.5 + \frac{1440}{20} \times 42 + \frac{960}{48} \times 20$
 $= 720 + 3024 + 400 = 4144$

Total number of 'Revolution 2020' sold in Kolkata and Ahmedabad book fairs
 $= 840 + 720 = 1560$
 Required difference = 4144 - 1560 = 2584

89. (e): Total number of '2 states' novel sold but not purchased by female customers in Kolkata and Bangalore book fair, which did not purchase by female customers
 $= \frac{840}{30} \times 50 \times \frac{(100 - 20)}{100} + \frac{960}{48} \times 32 \times \frac{(100 - 15)}{100}$
 $= 1120 + 544 = 1664$

90. (b): Let, Total invalid votes cast to X = x
 Let, Total invalid votes cast to Y = 1.25x
 ATQ,
 $x + 1.25x = 135 \Rightarrow 2.25x = 135$
 $\Rightarrow x = 60$ and $1.25x = 75$
 Total votes cast to X = $\frac{45}{100} \times 1200 = 540$
 Total votes cast to Y = $\frac{55}{100} \times 1200 = 660$
 Total valid votes cast to X = 540 - 60 = 480
 Total valid votes cast to Y = 660 - 75 = 585
 Required % = $\frac{585 - 480}{480} \times 100 = \frac{105}{480} \times 100 = 21\frac{7}{8}\%$

91. (c): Total votes cast to Y in city A, C and E together
 $= 1200 \times \frac{55}{100} + 1350 \times \frac{40}{100} + 1950 \times \frac{56}{100}$
 $= 660 + 540 + 1092 = 2292$
 Required average = $\frac{2292}{3} = 764$

92. (e): Total votes cast to Y in city D = $1600 \times \frac{46}{100} = 736$
 Total valid votes cast to Y in city D = 736 - $\frac{25}{100} \times 88$
 $= 736 - 22 = 714$
 Total votes cast to Y in city E = $1950 \times \frac{56}{100} = 1092$
 Total valid votes cast to Y in city E
 $= 1092 - \frac{50}{100} \times 144 = 1092 - 72 = 1020$
 Required % = $\frac{714}{1020} \times 100 = 70\%$

93. (d): Total votes cast to X in city C and D together
 $= 1350 \times \frac{60}{100} + 1600 \times \frac{54}{100} = 810 + 864 = 1674$
 Total votes cast to Y in city A and B together
 $= 1200 \times \frac{55}{100} + 1500 \times \frac{52}{100}$
 $= 660 + 780 = 1440$
 Required % = $\frac{1674}{1440} \times 100 = 116.25\%$

94. (b): Total valid votes cast to Y in city B
 $= 1500 \times \frac{52}{100} - 250 \times \frac{16}{100} = 780 - 40 = 740$
 Total valid votes cast to Y in city C
 $= 1350 \times \frac{40}{100} - 250 \times \frac{8}{100} = 540 - 20 = 520$
 Required difference = 740 - 520 = 220

95. (a): Mobiles sold of 64GB in state B and E together

$$= \frac{20}{100} \times 80,000 + \frac{55}{100} \times 70,000$$

$$= 16,000 + 38,500 = 54,500$$

Mobiles sold of 16GB in state A and D together

$$= \frac{50}{100} \times 60,000 + \frac{45}{100} \times 90,000$$

$$= 30,000 + 40,500 = 70,500$$

$$\text{Required difference} = 70,500 - 54,500 = 16,000$$

96. (a): 16GB mobiles sold in state A which are not defective = $\frac{2}{3} \times \frac{1}{2} \times 60,000 = 20,000$

64GB mobiles sold in state C which are defective

$$= \frac{1}{4} \times \frac{16}{100} \times 50,000 = 2,000$$

$$\text{Required percentage} = \frac{2000}{20000} \times 100 = 10\%$$

97. (c): Total mobiles sold of 16GB and 64GB together in state E = $\frac{(25+55)}{100} \times 70,000 = 56,000$

Total mobiles sold of 16GB and 64GB together in state B = $\frac{(20+40)}{100} \times 80,000 = 48,000$

$$\text{Required percentage} = \frac{56,000 - 48,000}{48,000} \times 100 = 16\frac{2}{3}\%$$

98. (d): Required ratio = $\frac{(15,000 + 32,000)}{\left(\frac{45}{100} \times 90,000 + \frac{25}{100} \times 70,000\right)} = \frac{47,000}{58,000}$

$$= 47:58$$

99. (e): Required average = $\frac{1}{3} \times \left(\frac{25}{100} \times 60,000 + \frac{16}{100} \times 50,000 + \frac{55}{100} \times 70,000 \right)$

$$= \frac{61,500}{3} = 20,500$$

100. (b): Required Ratio = $\frac{\frac{25}{100} \times 600}{\left[\frac{40}{100} + \frac{30}{100}\right] \times 600} = \frac{25}{70} = 5:14$

101. (e): Required difference = $\left(\frac{70}{100}\right) \times 600 - \left(\frac{35}{100}\right) \times 600 = 420 - 210 = 210$

102. (c): Required percentage = $\frac{70-50}{50} \times 100$

$$= \frac{20}{50} \times 100 = 40\%$$

103. (e): Required average = $\frac{1}{3} \left[\frac{80}{100} + \frac{60}{100} + \frac{70}{100} \right] \times 600$

$$= 420$$

104. (a): Required total = $\left[\frac{25}{100} + \frac{25}{100} + \frac{20}{100} \right] \times 600$

$$= 70 \times 6 = 420$$

105. (b): Total employees preferred metro from company S & T

$$= 91 \times \frac{70}{14} + 110 \times \frac{72.5}{12.5}$$

$$= 455 + 638$$

$$= 1093$$

Total employees preferred bus from company T, P & S

$$= 110 \times \frac{15}{12.5} + 92 \times \frac{24}{8} + 91 \times \frac{16}{14}$$

$$= 132 + 276 + 104$$

$$= 512$$

$$\text{Required difference} = 1093 - 512 = 581$$

106. (d): Total employee in P = $92 \times \frac{100}{8} = 1150$

$$\text{Total employee in S} = 91 \times \frac{100}{14} = 650$$

$$\text{Total employee in P \& S} = 1150 + 650 = 1800$$

$$\text{Required average} = \frac{1800}{2} = 900$$

107. (a): Total number of employee prefer metro from company 'A'

$$= 39 \times \frac{60}{5} \times \frac{125}{100} = 585$$

Total employee in company 'A'

$$= 585 \times \frac{100}{45} = 1300$$

$$\text{Total employee in company 'T'} = 110 \times \frac{100}{12.5} = 880$$

$$\text{Required percentage} = \frac{1300 - 880}{1300} \times 100$$

$$= 32\frac{4}{13}\%$$

108. (b): Total employee prefer bus from company R = $192 \times \frac{30}{15} = 384$

Total employee prefer bus from company S = $91 \times \frac{16}{14} = 104$

$$\text{Required ratio} = \frac{384}{104}$$

$$= 48:13$$

109. (a): Total employees preferred metro from company P = $92 \times \frac{68}{8} = 782$

Total employees preferred metro from company Q = $39 \times \frac{60}{5} = 468$

Total employees preferred metro from company R = $192 \times \frac{55}{15} = 704$

$$\text{Required sum} = 782 + 468 + 704 = 1954$$

110. (a): Total Graduate in University P

$$= \frac{1820 \times 3}{7} + \frac{3120 \times 5}{8}$$

$$= 2730$$

Total Undergraduate in University Q

$$= \frac{5005 \times 2}{7} + \frac{3003 \times 1}{7}$$

$$= 1859$$

$$\text{Required Difference} = 2730 - 1859 = 871$$

111. (c): Undergraduate females of university U = $\frac{4740 \times 1}{3} = 1580$

$$\text{Graduate male of university U} = \frac{3750 \times 1}{3} = 1250$$

$$\text{Required \%} = \frac{1580 - 1250}{1250} \times 100 = 26.4\%$$

112. (c): Graduate student of R.

$$= \frac{(3080 \times 7)}{11} + \frac{3640 \times 9}{13} = 4480$$

Graduate Student of "T"

$$= 3990 \times \frac{10}{19} + 1950 \times \frac{2}{5} = 2880$$

$$\text{Required Ratio} = \frac{4480}{2880} = \frac{14}{9}$$

113. (e): Required average = $\frac{1}{3} \left[\frac{1820 \times 3}{7} + \frac{3080 \times 7}{11} + \frac{4650 \times 8}{15} \right] = \frac{1}{3} [780 + 1960 + 2480] = \frac{1}{3} [5220] = 1740$

114. (a): Total student in S = 4650 + 5850 = 10500

$$\text{Graduate Male} = \frac{4650 \times 8}{15}$$

$$= 2480$$

$$\text{Probability} = \frac{2480}{10500} = \frac{124}{525}$$

115. (b): Total number of TV produced by B and D together = 3850 + 2690 = 6540

Total number of AC produced by A and B together = 3545 + 3265 = 6810

$$\text{Required ratio} = \frac{6540}{6810} = \frac{218}{227}$$

116. (a): Total number of fridge produced by all the companies together = 2119 + 3065 + 1258 + 2028 + 3000 = 11,470

$$\text{Required average} = \frac{11470}{5} = 2294$$

117. (d): Number of TV produced by E that remains unsold = $\frac{40}{100} \times 3750 = 1500$

Number of coolers produced by B that remains unsold = $1820 \times \frac{60}{100} = 1092$

$$\text{Required percent} = \frac{1092}{1500} \times 100 = 72.8\%$$

118. (b): Total number of products produced by company C = 4839 + 3158 + 1258 + 1745 = 11,000

Total number of products produced by company B = 3850 + 3265 + 3065 + 1820 = 12,000

$$\text{Required Difference} = 12,000 - 11,000 = 1000$$

119. (e): Total number of TV produced by company B and cooler produced by company D together = 3850 + 1250 = 5100

Total number of Fridge produces by company E = 3000

$$\text{Required \%} = \frac{5100 - 3000}{3000} \times 100 = 70\%$$

120. (a): Total number of products produced by A = 9,503
Total number of products produced by B = 12,000
Total number of products produced by C = 11,000
Total number of products produced by D = 8,100
Total number of products produced by E = 10,955
So, B has produced max. number of products.

Practice MCQs for Mains

Direction (1 – 5): Table given below shows data regarding number of people applied for loan under 'PM Mudra Yojna' from five different villages. Read the data carefully and answer the questions.

Villages	Number of people applied for loan	Percentage of people who get loan out of total number of people applied for loan	Percentage of male who get loan out of total people who get loan	Ratio of female who do not get loan to female who get loan
P	7200	$66\frac{2}{3}\%$	65%	10 : 21
Q	8000	60%	75%	3 : 5
R	8800	$81\frac{9}{11}\%$	82%	4 : 9
S	10000	72%	76%	16 : 27
T	9600	68.75%	80%	8 : 11

- What is the difference between number of males applied for loan from village P and village T?
(a) 2600 (b) 2200 (c) 2400 (d) 3000 (e) 2000
- Total females who do not get loan from village S is what percent more or less than total females who do not get loan from village Q?
(a) $40\frac{2}{9}\%$ (b) $44\frac{2}{9}\%$ (c) $46\frac{2}{3}\%$ (d) $48\frac{2}{3}\%$ (e) $42\frac{2}{9}\%$
- What is the ratio of total males who do not get loan from village Q to total males who do not get loan from village S?
(a) 113:111 (b) 115: 111 (c) 64: 111 (d) 155: 111 (e) 111 : 115

4. How many females applied for loan from the village where number of males who get loan are second highest among all villages?
 (a) 2772 (b) 2726 (c) 2752 (d) 2742 (e) 2732
5. What is the average of number of males who do not get loan from village R and number of females who get loan from village R?
 (a) 1120 (b) 1140 (c) 1260 (d) 1200 (e) 1160

Direction (6 - 10) : Given below data shows total number of vehicles (Petrol, Diesel & CNG) manufactured by four companies. Read the data carefully and answer the questions.

Companies	Total vehicles manufactured	% of Petrol vehicles manufactured	% of Diesel vehicles manufactured
A	800	20%	40%
B	960	25%	45%
C	1020	30%	40%
D	840	25%	50%

6. Diesel vehicles manufactured by A & Petrol vehicles manufactured by B together are what percent more than Diesel vehicles manufactured by D?
 (a) $30\frac{1}{3}\%$ (b) 25% (c) 30% (d) $33\frac{1}{3}\%$ (e) 40%
7. Find the ratio of CNG vehicles manufactured by C & D together to Petrol vehicles manufactured by A & B together?
 (a) 127 : 100 (b) 139 : 100 (c) 109 : 100 (d) 119 : 100 (e) 129 : 100
8. Average of Diesel vehicles manufactured by B, C & E is 400 and total vehicle manufactured by E are 1040. If ratio of Diesel vehicles to CNG vehicles manufactured by E is 9 : 5, then find Petrol vehicles manufactured by E?
 (a) 480 (b) 440 (c) 420 (d) 360 (e) 520
9. CNG vehicles manufactured by B are what percent more than CNG vehicles manufactured by D?
 (a) $40\frac{1}{7}\%$ (b) $42\frac{1}{7}\%$ (c) $32\frac{1}{7}\%$ (d) $37\frac{1}{7}\%$ (e) $35\frac{1}{7}\%$
10. Find average of Petrol vehicles manufactured by B, C & D?
 (a) 232 (b) 242 (c) 252 (d) 272 (e) 264

Directions (11 - 15): Table given below shows data of five institutes regarding number of girls students, percentage of boys and number of students (boys + girls) under one mentor. Study the data given below carefully and answer the following questions.

Institute	Number of Students under one mentor	Number of girls	Percentage of Boys
A	8	80	60%
B	15	144	68%
C	16	176	45%
D	24	108	70%
E	25	90	64%

11. Number of mentors in institute D is what percent more/less than number of mentors in institute A?
 (a) 20% (b) 160% (c) 80% (d) 60% (e) 40%
12. If in institute E, girls students increases by 60% and boys students increases by 35% while number of students under one mentor increases by 20% then how many more mentors are required in institute E?
 (a) No more mentors required (b) 1 (c) 2 (d) 3 (e) 4
13. Total number of students in institute B and C together is how much more than total number of students in institute D and E together?
 (a) 130 (b) 140 (c) 150 (d) 160 (e) 170

14. Out of total mentors in institute C, 65% are females, then find the number of male mentors in institute C.
 (a) 5 (b) 7 (c) 9 (d) 11 (e) 13
15. Total number of students in another institute F is 15% more than that of in institute D, while number of students under one mentor is 20% more than that of in institute B. Find number of mentors required in institute F.
 (a) 17 (b) 19 (c) 21 (d) 23 (e) 25

Directions (16-20): Given table shows the quantity of Rice and tea (in metric tons) exported from different countries in 2017 and quantity imported (in percentage) with respect to last year import of six country in 2017.

Nations ↓	Rice		Tea	
	Export	Import	Export	Import
India	5000	120%	240	40%
South Africa	4500	110%	140	70%
China	3760	80%	220	40%
U.S.	3800	100%	60	140%
Brazil	4100	90%	110	125%
Japan	2600	180%	135	100%

16. India's imported rice and imported tea are in the ratio of 2 : 1 in year 2017. If in 2016 rice imported by India is 120 metric ton then find the sum of total export (rice and tea) of India in 2017 and total import (rice and tea) of India in 2016.
 (a) 5440 (b) 5520 (c) 5540 (d) 5515 (e) 5480
17. If total import of Japan in 2016 is 30% of what it exported in 2017 and ratio between rice to tea imported in 2017 is 360 : 347 then what amount of rice is imported by Japan in 2017?
 (a) 540 (b) 520 (c) 480 (d) 460 (e) 550
18. Rice import of all countries are same in 2016 and Tea import of all countries are same in 2017. If Rice and Tea import of China in 2016 are in the ratio of 5 : 7 then find the ratio total Rice import in 2017 to tea import in 2016 by countries together ?
 (a) 313 : 450 (b) 451 : 850 (c) 425 : 313 (d) 451 : 550 (e) 850 : 457
19. Total export by U.S. in 2017 is what percent less/more than the total export of Brazil in 2017 (approximately)?
 (a) 7% (b) 9% (c) 4% (d) 8% (e) 10%
20. India's export of Rice is likely to increase by 6% in 2018 and export of Rice of India in 2017 is 125% of what it was in 2016. Export increase of Rice in India from 2016 to 2018 is what percent of the tea imported by Brazil in 2016 if in 2017 Brazil only purchased tea from China and China exports 50 percent of tea to Brazil in 2017?
 (a) $1260\frac{5}{11}\%$ (b) $1420\frac{2}{11}\%$ (c) $1575\frac{6}{11}\%$ (d) $1385\frac{4}{11}\%$ (e) $1477\frac{3}{11}\%$

Directions (21-25): Study the table given below and answer the following questions.

Table gives information about production and consumption of 3 different crops in 5 different states. All these 5 states produce and consume only these 3 crops.

States	Wheat produced (in tonnes)	% of wheat consumed	Rice produced (in tonnes)	% of rice consumed	Bajra produced (in tonnes)	% of bajra consumed
Delhi	4,000	60%	2,000	90%	3,000	80%
Rajasthan	6,000	75%	1,500	60%	9,000	40%
Kerala	2,000	80%	4,000	80%	5,000	90%
Haryana	8,000	50%	5,000	40%	2,000	75%
Gujarat	4,500	80%	2,500	20%	7,500	60%

21. Total unconsumed wheat in Delhi, Kerala and Haryana together are what percent more or less than unconsumed bajra in Kerala, Haryana & Gujarat together?
 (a) 80% (b) 20% (c) 50% (d) 40% (e) None of these.

22. Average of consumed rice in Kerala, Haryana and Gujarat is how much less than average of wheat produced in these 5 states?
 (a) 3,200 tonnes (b) 3,600 tonnes (c) 3,500 tonnes (d) 2,800 tonnes (e) 3,000 tonnes
23. Total consumed bajra in Delhi, Rajasthan & Gujarat together are what percent of consumed wheat in Delhi, Haryana and Gujarat together?
 (a) 105% (b) 120% (c) 90% (d) 135% (e) 75%
24. Total unconsumed rice in all these 5 states together is how much more or less than total bajra produced by Rajasthan and Haryana together?
 (a) 4,500 tonnes (b) 4,400 tonnes (c) 4,800 tonnes (d) 4,200 tonnes (e) 4,000 tonnes
25. Find ratio of consumed bajra in Kerala and Haryana together to unconsumed bajra in Delhi and Rajasthan together.
 (a) 5:4 (b) 1:1 (c) 2:3 (d) 6:7 (e) 1:3

Direction (26 – 30): Table given below shows the total population (who are using Ola, Uber and Rapido together) in five different sectors of the Noida.

Read the given information carefully and answer the following questions.

Sector	Total population	Ratio of Population using (Ola: Uber)	Percentage of population using Rapido
15	4800	9: 8	15
22	3600	4: 5	10
12	2400	6: 5	12
20	3000	3: 5	20
24	4000	3: 2	25

26. If ratio of male to female who are using Ola in sector-15 is 3: 2, then female who are using Ola in sector-15 is what percent of total population who are using Rapido in sector-24?
 (a) 88% (b) 85% (c) 86.75% (d) 86.4 % (e) $84\frac{4}{9}\%$
27. Total population who are using Rapido in sector-22 and sector-12 together is how much more or less than total population who are using Uber in sector-24?
 (a) 548 (b) 552 (c) 564 (d) 558 (e) 556
28. Find the average of the total population who are using Ola in sector-12, sector-20 and sector-24 together?
 (a) 1278 (b) 1288 (c) 1298 (d) 1273 (e) 1284
29. Total population who are using Uber in sector-15 and sector-20 together are what percent more or less than the total population using Rapido in these two sectors?
 (a) $149\frac{1}{11}\%$ (b) $154\frac{1}{11}\%$ (c) $159\frac{1}{11}\%$ (d) $161\frac{4}{11}\%$ (e) $161\frac{9}{11}\%$
30. Find ratio of total population who using Rapido in sector-15, sector-20 and sector-24 together to total population who are using either of these three in sector-12?
 (a) 29: 36 (b) 29: 30 (c) 14: 15 (d) 7: 8 (e) 27: 35

Direction (31-35): The following table shows the percentage of people who renewed their amazon prime membership out of total number of people who have amazon prime membership in 5 different cities and it also shows percentage of females who renewed their prime membership out of total people who renewed their prime membership.

	% of people who renewed their prime membership	% of female who renewed their prime membership.
Noida	40%	25%
Delhi	60%	40%
Gurgaon	55%	30%
Jaipur	45%	50%
Kanpur	65%	40%

Note: Total number of people who have amazon prime membership = people who renewed + total number people who take new membership.

Note: Total people = total male + total female

31. If total number of males who renewed their prime membership from Noida is 1800 and females who renewed their membership from Kanpur is 1300 then find total number of people having prime membership from these two cities together?
 (a) 12000 (b) 10000 (c) 11000 (d) 13000 (e) 15000
32. Total number of females who take new membership from Gurgaon is 1200 which is $33\frac{1}{3}\%$ of total people who takes new membership from there. Find the females who renewed their membership from there?
 (a) 1280 (b) 1240 (c) 1300 (d) 1360 (e) 1320
33. Ratio of people who take prime membership from Delhi to that of Jaipur is 3:2. Number of females who take new membership from these two cities are equal and difference between number of males who have new membership from these two cities are 300 then find the total female members who renewed their membership from these two cities?
 (a) 3510 (b) 3630 (c) 3570 (d) 3580 (e) 3620
34. Find the total number of females who took new membership from Kanpur, if the total number of males who renewed their membership from Kanpur is 4680 and males who take new membership is $33\frac{1}{3}\%$ more than that of females from Kanpur?
 (a) 1600 (b) 1500 (c) 2000 (d) 1800 (e) 2100
35. Find the percentage of females who took new membership out of total people from Delhi if the total number of females who renewed their membership from Delhi is equal to males who took new membership from Delhi?
 (a) 12% (b) 15% (c) 16% (d) 17.5% (e) 20%

Directions (36-41): Study the table given below and answer the following questions.

Table shows the percentage increase in revenue of company – P & Q as compared to their respective revenue in previous year in 5 different years. Ratio of revenue of company – P to that of company – Q at the end of 2014 is 3:5.

Years	% change in revenue of P	% change in revenue of Q
2015	$66\frac{2}{3}\%$	20%
2016	60%	50%
2017	25%	$33\frac{1}{3}\%$
2018	20%	25%
2019	40%	40%

Note – Profit % or loss % = $\frac{\text{Revenue} - \text{Cost}}{\text{Cost}} \times 100$ or $\frac{\text{Cost} - \text{Revenue}}{\text{Cost}} \times 100$

36. If in 2016 company – P & Q earned 60% profit and 50% profit respectively and revenue of Q in 2015 is Rs.30 lacs, then find total cost of company – P & Q together in 2016.
 (a) Rs. 65 lacs (b) Rs. 70 lacs (c) Rs. 20 lacs (d) Rs. 35 lacs (e) Rs. 55 lacs
37. If revenue of company – P in 2016 is Rs.60 lacs, then find difference between average revenue of company – Q in 2015 & 2016 and average revenue of company – P in 2014 & 2015.
 (a) Rs. 26.25 lacs (b) Rs. 38.25 lacs (c) Rs. 21.25 lacs (d) Rs. 28.25 lacs (e) Rs. 33.25 lacs
38. If average revenue of company – P in 2015 & 2017 is Rs.300000 and company – Q earned 20% profit in 2016, then find cost of company – Q in 2016.
 (a) Rs. 4.5 lacs (b) Rs. 2.5 lacs (c) Rs. 3 lacs (d) Rs. 5 lacs (e) Rs. 6.5 lacs

39. Revenue of company – Q in 2018 is what percent more than revenue of company – P in 2017?
 (a) 150% (b) 50% (c) 250% (d) 100% (e) 200%
40. If cost of company – Q in 2016 is Rs.20,000 less than cost of company – P in 2017 and profit % earned by each of company – P in 2017 and company – Q in 2016 is 25%, then find revenue of company – Q in 2014.
 (a) Rs. 1.40 lacs (b) Rs. 1.75 lacs (c) Rs. 2.25 lacs (d) Rs. 2 lacs (e) Rs. 1.25 lacs
41. Find ratio of revenue of company – Q in 2019 to revenue of company – P in 2016.
 (a) 17:9 (b) 2:1 (c) 3:1 (d) 21:8 (e) None of the above.

Direction (42 – 45): A survey was conducted by 'Aaj Tak' about public opinion on 2019 'Lok Sabha' election' in five different metropolitan cities of India. Given below table shows the percentage of people go with 'BJP' and 'INC' and ratio between male to female go with 'BJP', 'INC' and with 'Other parties'. Read the table carefully and answer the questions.

Metropolitan Cities	Percentage of people go with 'BJP'	Percentage of People go with 'INC'	Ratio of male to female go with 'BJP'	Ratio of male to female go with 'INC'	Ratio of male to female with 'other parties'
Delhi	48%	32%	5 : 3	9 : 7	5 : 1
Mumbai	24%	36%	3 : 1	7 : 5	11 : 7
Kolkata	15%	45%	2 : 1	2 : 1	7 : 2
Bangalore	32%	48%	7 : 5	7 : 5	2 : 1
Hyderabad	20%	40%	5 : 2	5 : 3	15 : 13

42. If total number of male in survey go with 'Other parties' from Hyderabad is 6000 and total female in survey go with 'INC' from Delhi is 3360. Then find total male go with 'BJP' from Delhi is what percent more than total male go with 'BJP' from Hyderabad?
 (a) 75% (b) 80% (c) 56% (d) 85% (e) 90%
43. If total female in survey go with 'INC' from Mumbai is 5400 and total female in survey go with 'BJP' from Bangalore is 6400. Then find ratio between total male in survey go with 'Other parties' from Mumbai to total male in survey go with 'BJP' from Bangalore?
 (a) 55 : 67 (b) 55 : 61 (c) 55 : 59 (d) 55 : 57 (e) 55 : 56
44. If Ratio of total survey in Mumbai to Kolkata is 2 : 1 and difference between male in survey go with 'BJP' from Mumbai and male in survey go with 'Other parties' from Kolkata is 880. Then find difference between total people participated in survey from Kolkata and total people participated in survey from Mumbai?
 (a) 24000 (b) 12000 (c) 18000 (d) 16000 (e) 20000
45. If total male in survey go with 'INC' from Delhi, Mumbai and Hyderabad is 4320, 7560, and 7000 respectively. Then find average of male in survey go with 'BJP' from Delhi & Mumbai and with 'Other parties' from Hyderabad?
 (a) 6460 (b) 6760 (c) 6540 (d) 6520 (e) 6560

Directions (46-50): Read the given information carefully and answer the following questions.

Sony Company has five factories with different capacities of producing earphones every month (working days for every month may vary for each factory). In the production process, there are only three types of cost occurs i.e. Raw material cost, Labor cost and Selling cost which are different for different factories. Two units of earphone are produced per day by each factory.

Profit/unit= Selling price-(Raw material cost+ Labor cost+ Selling cost)

Selling cost=Packaging cost+ Transportation cost

Sales Margin= (Profit/unit)/ (Selling price/unit)

Factories	Working days	Selling price/unit	Selling cost/unit	Raw material cost/unit	Labor cost/day
A	28	1200	40	400	300
B	25	1500	60	600	600
C	27	1000	50	500	400
D	30	1600	75	600	500
E	24	800	50	250	200

46. Company used new technology which increased the production by 50% and labor cost by 25% per day for every Factory then find the total profit earned by factories C and D together are approximately what percent more or less than profits earned by Factory A and B together?
 (a) 15% (b) 5% (c) 10% (d) 20% (e) 25%
47. A store ordered 80 units of pre-packaged earphone and will also be picked up by that store in 20 days to avoid transportation cost. To deliver this order Company can use multiple factories for production. Find which of the following options will ensure maximum profits for the company?
 (a) Factory D, Factory B & Factory A (b) Factory A & Factory D (c) Factory A & Factory B
 (d) Factory B, Factory D & Factory C (e) Factory D & Factory E
48. For factory B, C, D and E, which of the following order is correct regarding Sales Margin?
 (a) $D > C > E > B$ (b) $C > D = B > E$ (c) $E = D > C > B$ (d) $E > D > B > C$ (e) $C > D > E > B$
49. If total Raw material cost for factory A is increased by 4.5% and labor cost per hour is also increased by Rs 7.5 per hour then find the overall increment in the production cost for factory A in that month is what part of selling price of all the units produced in that month (Given: Working hours in a day = 8 hours).
 (a) $\frac{3}{70}$ (b) $\frac{4}{75}$ (c) $\frac{1}{20}$ (d) $\frac{2}{55}$ (e) $\frac{1}{25}$
50. Profit earned per day by Factory D is what percent of the profit earned per day by Factory B?
 (a) 120% (b) 125% (c) $122\frac{1}{2}\%$ (d) $127\frac{1}{2}\%$ (e) 130%

Directions (51-55): The given table shows the profit percentage for two different companies X and Y over a period of six years.

Years	Profit percentage (for X)	Profit percentage (for Y)
2008	40	50
2009	40	$62\frac{1}{2}$
2010	50	60
2011	60	45
2012	75	40
2013	40	60

(i) Profit = Income – Expenditure

(ii) Profit % is calculated as percentage of total income

51. If the profit of Company X in year 2009 is Rs. 1,08,000 and that for Company Y in that year is Rs. 1,75,000 then find the ratio of expenditure of Y in 2009 to that of X in that year.
 (a) 45 : 68 (b) 18 : 35 (c) 24 : 49 (d) 35 : 54 (e) 35 : 58
52. If the expenditure of Company Y in 2011 is Rs. 36,000 more than that of Company Y in 2010 then find the average of profit made by Y in these two years and Company X in 2011. (Consider income for X and Y is same in these two years).
 (a) Rs. 1,32,000 (b) Rs. 1,34,500 (c) Rs. 1,20,000 (d) Rs. 1,40,000 (e) Rs. 1,36,000
53. If the expenditure of Company X in 2010 was Rs. 1,35,000 and the income of X in 2010 was expenditure of X in 2013 then find the percentage change in income in 2013 over the year 2010?
 (a) 75% (b) 60% (c) $66\frac{2}{3}\%$ (d) $62\frac{1}{2}\%$ (e) 80%
54. If profit for Y in 2012 is Rs. 2500 more than profit of X in that year and the expenditure of X is $\frac{7}{32}$ th of the expenditure of Y in that year, then find the average of income of X and Y in that year?
 (a) Rs. 3,00,000 (b) Rs. 3,05,000 (c) Rs. 3,50,000 (d) Rs. 3,15,000 (e) Rs. 3,05,500
55. In year 2010, total expenditure of X & Y is 45% of their total incomes in that year. Then, find the ratio (X : Y) of their profits in that year?
 (a) 4 : 5 (b) 5 : 6 (c) 5 : 7 (d) 3 : 4 (e) 2 : 3

Directions (56-59): The following table shows the number of students who secured different ranges of marks in QA (Quantitative Aptitude) section and VARC (Verbal and Reading Comprehension) section of 102 marks each in CAT. All students scored integer marks. In the table, both the lower limit and the upper limit of the range of marks are inclusive.

Range of Marks	VARC	QA
0-19	720	440
20-39	537	600
40-54	490	650
55-69	560	540
70-79	420	400
80-89	190	250
90-95	45	80
96-102	8	10

56. Which of the following could be the total minimum possible score of all the students in CAT examination in QA section?
 (a) 1,39,340 (b) 1,05,820 (c) 1,19,300 (d) 1,23,860 (e) None of the above.
57. What can be best said about the average marks of the students in VARC section?
 (a) Approximately ranging between 37.22 and 52.16. (b) Greater than 49.6. (c) Less than 49.6.
 (d) Approximately ranging between 41.70 and 60.32. (e) Cannot be determined.
58. What is the minimum number of students who scored non-unique marks in VARC section?
 (a) 2970 (b) 2875 (c) 2908 (d) 2934 (e) 2852
59. Find the ratio of total number of students who have scored more than 39 but less than 90 marks in VARC to total students who have scored more than 69 marks in QA section?
 (a) 83:40 (b) 83:36 (c) None of the above (d) 83:35 (e) 83:39

Directions (60-63): The table given below shows the production (in thousand tonnes) of the various types of crops produced in India for three consecutive years. It also shows the percentage contribution of UP, one of the states, to the total production of India for each year.

	2001		2002		2003	
	India (in'000 tonnes)	U.P. (in%)	India (in'000 tonnes)	U.P. (in%)	India (in'000 tonnes)	U.P. (in%)
Wheat	1500	20	1800	25	2000	25
Rice	2000	15	2200	20	2400	20
Bajra	500	25	600	15	800	15
Maize	400	20	300	15	500	20
Other	1200	10	1400	10	1000	10

60. In which year was the percentage contribution of UP in the total production of India (all the crops) was maximum during the period 2001-2003?
 (a) 2002 (b) 2001 (c) 2003 (d) Can't be determined (e) None of these
61. Which of the following crops showed a decline in production for two consecutive years in UP during the period 2001-2003?
 (a) Wheat (b) Rice (c) Bajra (d) Maize (e) None of these
62. Which type of crop showed a decline in production for at least one year in UP despite showing an increase in production for two consecutive years in India during the period 2001-2003?
 (a) Bajra (b) Other (c) Rice (d) Wheat (e) Maize
63. Average of total production of Wheat, Rice and Bajra in UP in 2002 is approximately what percent more or less than the total production of Maize in India in all the given years.
 (a) 90% (b) 72% (c) 48% (d) 82% (e) 60%

Direction (64–68): Table given below data regarding students participated for 'National level math Olympiad' from five different schools. Read the data carefully and answer the questions.

Schools	Number of students who participated	Passed students percentage	Percentage of boys out of total passed students	Ratio of failed Girls to passed girls
A	3600	$66\frac{2}{3}\%$	65%	10 : 21
B	4000	60%	75%	3 : 5
C	4400	$81\frac{9}{11}\%$	82%	4 : 9
D	5000	72 %	76%	16 : 27
E	4800	68.75%	80%	8 : 11

64. Find the difference between number of boys participated from school A & E?
 (a) 1300 (b) 1100 (c) 1500 (d) 1800 (e) 900
65. Failed girls from D is what percent more or less than failed girls from B?
 (a) $40\frac{2}{9}\%$ (b) $44\frac{2}{9}\%$ (c) $46\frac{2}{3}\%$ (d) $48\frac{2}{3}\%$ (e) $42\frac{2}{9}\%$
66. Find the ratio of failed boys in B to failed boys in D?
 (a) 113:111 (b) 115: 111 (c) 64: 111 (d) 155: 111 (e) 111 : 115
67. From that school where passed boys are second maximum, how many girls participated from that school ?
 (a) 1386 (b) 1396 (c) 1376 (d) 1316 (e) 1366
68. Find average number of failed boys & passed girls from C?
 (a) 560 (b) 540 (c) 520 (d) 600 (e) 580

Directions (69-73): Table shows distribution of total number of Audience from five different countries watching live five world cup finals in five different years. Total number of Audience watching from India in absolute value and remaining four distributed in percentage out of total.

World cup finals	Distribution of total audience watching live from stadium in 00%				
	India	Australia	South Africa	England	West indies
1999	7250	10%	40%	10%	20%
2003	27250	30%	5%	13%	2%
2007	2250	50%	20%	5%	15%
2011	45000	12%	18%	5%	5%
2015	6250	50%	10%	10%	20%

69. Audience watching 2003 final from all the five countries are what percent of total audience watching 2015 final from Australia and West Indies together?
 (a) $124\frac{7}{8}\%$ (b) $123\frac{5}{7}\%$ (c) $122\frac{4}{7}\%$ (d) $123\frac{4}{7}\%$ (e) $124\frac{4}{7}\%$
70. Audience watching 2007 final from Australia and South Africa together approximately what percent more or less than Audience watching 1999 final from South Africa and West Indies together?
 (a) 28% (b) 32% (c) 24% (d) 34% (e) 22%
71. Find the ratio between total Audience watching 1999 final from all the five countries together to Audience watching 2003 and 2007 final together from Australia?
 (a) 725 : 551 (b) 715 : 552 (c) 725 : 552 (d) 705 : 551 (e) 735 : 551
72. What is average of total Audience watching all the five final from the south Africa?
 (a) 8195 (b) 8295 (c) 8095 (d) 8395 (e) 8285
73. Ratio between male to female audience watching 2003 final from England is 4 : 1, then find difference between total female audience from England and total audience watching 2003 final from West Indies ?
 (a) 327 (b) 325 (c) 323 (d) 321 (e) 326

Directions (74-78):- Given below is the summary of fixed and consumption charges of electricity consumption. Study the instructions and data carefully and answer the following questions.

Note: All other charges of Fixed and Consumption charges are taken on their base charges respectively.

Billing Period		Aug 01, 2019 to Aug 31, 2019		
Fixed Charges				
Load (KW)	Charge (Rs.)	Surcharge (%)	Taxes (%)	Total (Rs.)
2	150	4	5	
4	180	5	5	
6	200	6	8	
8	250	8	8	
10	400	10	12	
Consumption Charge				
Units (kWh)	Base Rate (Rs.)	Taxes (%)		Net Rate (Rs.)
0-200	4	5		
201-400	5	5		
401-800	6.5	8		
801-1200	8	8		
Above 1200	10	10		

74. What will be the bill amount if a person usage for August is 700 kWh on a 4 KW load connection?
 (a) Rs. 3138 (b) Rs. 3396 (c) Rs. 4000 (d) Rs. 3594 (e) Rs. 4194
75. What will be the average rate per unit for 800 units consumption? (not taking load into consideration)
 (a) Rs. 5.87 (b) Rs. 5.49 (c) Rs. 7.02 (d) Rs 6.32 (e) None of these
76. Bill amount for July of Mr. Jagdish was Rs. 10000. By what percent his expenditure on electricity bill will increase in August if he has taken 6 KW connection and consumes 1400 units of electricity?
 (a) 3.54% (b) 1.1% (c) 5.82% (d) 6.82 % (e) 6.42%
77. What is the ratio of fixed charges for a person opting for 4 KW connections to that of person having 10 KW connection?
 (a) 9 : 20 (b) 3969 : 9856 (c) 189 : 440 (d) 189 : 448 (e) 99 : 244
78. What is the average of fixed charges for Deepak & Ranjan if they have taken 6 KW & 8 KW connections respectively?
 (a) Rs. 225 (b) Rs. 259 (c) Rs. 241 (d) Rs. 243 (e) Rs. 260.28

Directions (79-82): Read the given information carefully and answer the following questions.

Based on the location of the buildings, the cost (in rupees) per square feet (CPSF) of a flat is fixed by the builder for three different buildings- **A, B and C.**

In each building as the floor increases, the CPSF increases by Rs. 50 per floor.

For every flat sold, agent gets commission of 2% (i.e. 1% from each party- customer and owner) of the price of the flat.

The following table gives the CPSF of the ground floor and the number of floors in a building along with the area (in sq. ft.) of each flat in that building.

Building	CPSF for Ground floor	Area of each flat	No. of floors
A	4000	1600	8
B	4350	1200	9
C	4700	1400	10

79. How much does a customer pay for a flat on the sixth floor of building 'C'?
- (a) None of these (b) 68.6 lakhs (c) 72.72 lakhs (d) 70.7 lakhs (e) 68.68 lakhs
80. Agent gets same commission on selling two different flats. One of the flats is located on the 2nd floor in some building while the other is located on the 4th floor on some other building. Which of the following options is true about these flats?
- (a) One of the flats is located on the 2nd floor of building 'A' while the other is on the 4th floor of building 'C'. (b) One of the flats is located on the 2nd floor of building 'C' while the other is on the 4th floor of building 'B'. (c) One of the flats is located on the 2nd floor of building 'A' while the other is on the 4th floor of building 'B'. (d) One of the flats is located on the 2nd floor of building 'C' while the other is on the 4th floor of building 'A'. (e) None of these.
81. A person buys flats on the sixth, seventh and ninth floor of building 'B'. He gets 20% discount on CPSF of any one of the flats. He decides to use the discount to minimize the total cost. Approximately how much does he pay to the agent for all the three flats?
- (a) 1.38 lakhs (b) 1.58 lakhs (c) 1.68 lakhs (d) 1.48 lakhs (e) 1.65 lakhs
82. Find the difference between the commissions received by the agent when 7th floor of buildings A and B is sold?
- (a) Rs 27200 (b) Rs 25800 (c) Rs 25900 (d) Rs 26200 (e) Rs 26400

Directions (83-87): In the given below table graph shows data about number of candidates from five different centers appeared in an exam. Read carefully all the instructions and answer the following questions

Centers	Candidates appeared in online exam	Candidates appeared in offline exam	Candidates who did not complete exam (online+ offline)
A	440	45 %	105
B	320	36%	120
C	460	54 %	170
D	500	60 %	90
E	525	30%	140

Note: (Total candidates in any center = candidates appeared in online exam + candidates appeared in offline exam)

83. Total number of candidates who completed the exam from center A is how much more or less than total number of candidates who completed the exam from center D?
- (a) 480 (b) 515 (c) 465 (d) 570 (e) 425
84. If number of candidates who didn't complete online exam and who didn't complete the offline exam from center D are equal, then number of candidates who completed offline exam from center D is approximately what percent more than number of candidates who completed online exam from same center?
- (a) 60 % (b) 55 % (c) 51 % (d) 46 % (e) 64 %
85. What is the difference between the total number of candidates who appeared in online and offline exams from all the centers together?
- (a) 180 (b) 190 (c) 175 (d) 200 (e) 210
86. Find the ratio of total number of candidates who appeared for online exams from center C and center D together to the total number of candidates who appeared for offline exams from center A and center B together?
- (a) 16: 9 (b) 16: 13 (c) 9: 16 (d) 11: 5 (e) 8: 9
87. Total candidates who appeared for offline exams from center A and center B together is what percentage of total candidates who appeared for online exams from center B?
- (a) 157.5 % (b) 160 % (c) 168.75 % (d) 172.5 % (e) 165 %

Direction (88 – 91): Given below table shows the percentage of number of cars sold by four different motor companies, percentage of number of total returned cars out of total number of sold cars in two successive years(2016, 2017) . Read the graph carefully and answer the following questions.

Note – (I) Total number of manufactured cars = number of Unsold cars + number of Sold cars

(II) Total actual number of cars sold = Total number of sold cars – number of returned cars

	Percentage of number of cars sold in 2016	Percentage of number of cars sold in 2017	Percentage of number of cars returned in 2016	Percentage of number of cars returned in 2017
TATA	80%	75%	15%	10%
HYUNDAI	65%	70%	20%	15%
MARUTI-SUZUKI	80%	85%	12.5%	17.5%
HONDA	75%	70%	15%	22.5%

88. The ratio between total number of cars manufactured by TATA and HONDA in the year 2016 is 6 : 7 and the total actual number of cars sold by HONDA is 4590 units more than that of TATA in the same year. If total number of cars returned to HYUNDAI in the year 2017 is 1920 units less than total number of cars returned to TATA in 2016 and total number of cars returned to MARUTI SUZUKI in the year 2017 is 4830 units more than total number of cars returned to HONDA in 2016, then find the difference between total number of manufactured cars by HYUNDAI and MARUTI SUZUKI in the year 2017?

- (a) 36,000 (b) 42,000 (c) 44,000 (d) 40,000 (e) 32,000

89. Total number of cars manufactured by TATA in the year 2017 is 40% more than that of total number of cars manufactured by MARUTI SUZUKI in the year 2016 and total number of cars returned to TATA in 2017 is 120 units more than total number of cars returned to MARUTI SUZUKI in the year 2016. If total number of cars returned to HONDA in the year 2017 is 2010 units more than total number of cars returned to MARUTI SUZUKI in the year 2016, then find total number of cars manufactured by HONDA in the year 2017?

- (a) 24,000 (b) 20,000 (c) 28,000 (d) 18,000 (e) 16,000

90. The ratio between total number of cars manufactured by HYUNDAI, MARUTI SUZUKI & HONDA in the year 2016 is 2 : 3 : 4 and average number of cars returned to these three companies in the same year is 4040 units. If total number of cars manufactured by HYUNDAI, MARUTI SUZUKI & HONDA in the year 2017 is increased by 20%, 25% and 12.5% respectively over that of the previous year, then find the average number of cars manufactured by HYUNDAI, MARUTI SUZUKI & HONDA in the year 2017?

- (a) 42,400 (b) 42,800 (c) 42,600 (d) 42,000 (e) 41,600

91. The ratio between total number of cars manufactured by HYUNDAI & HONDA in the year 2016 is 8 : 9 and the ratio of number of cars manufactured by HYUNDAI & HONDA in the year 2016 to 2017 is 2 : 3 and 3 : 5 respectively. If total actual number of cars sold by HYUNDAI & HONDA together in the year 2016 is 39590 units then find total number of cars manufactured by HONDA in the year 2017 is what percentage more/less than total number of cars manufactured by HYUNDAI in the same year?

- (a) 20% (b) 15% (c) 10% (d) 25% (e) 35%

Direction (92 – 95): Given below table shows total application of five different exams filled by online mode, percentage of application filled by offline mode. Also table shows

Percentage of application rejected (online mode + offline mode) and percentage of applicants appeared in each exam. Read the table carefully and answer the questions.

Note – Total application = Number of applications filled by online mode + Number of applications filled by offline mode

Exams	Number of applications filled by online mode	Percentage of application filled by offline mode	Percentage of applications rejected (online mode + offline mode)	Percentage of remaining applicants appeared in exams
RRB PO	15000	76%	15%	80%
IBPS PO	31500	64%	20%	96%
SBI PO	22500	52%	4%	90%
SBI CLERK	52500	58%	16%	84%
IBPS CLERK	51750	54%	20%	95%

92. Out of total rejected applications in RRB PO & SBI CLERK exams ratio between applications rejected of online mode to offline mode is 2 : 3 and 3 : 7 respectively. Find difference between total applications rejected of online mode and total applications rejected of offline mode in these two exams?
 (a) 9875 (b) 9865 (c) 9878 (d) 9855 (e) 9845
93. Total applicants appeared in SBI PO exam is what percent less than total applicants appeared in IBPS PO exam?
 (a) $37\frac{41}{56}\%$ (b) $33\frac{41}{56}\%$ (c) $35\frac{41}{56}\%$ (d) $31\frac{41}{56}\%$ (e) $39\frac{41}{56}\%$
94. Out of total appeared applicants in RRB PO & IBPS CLERK exams 1.8% & 2% applicants get final selection respectively. Find total applicants who get final selection in these two exams?
 (a) 2425 (b) 2455 (c) 2435 (d) 2475 (e) 2415
95. Out of total rejected applications in SBI PO & IBPS PO exams ratio between applications rejected of online mode to offline mode is 7 : 8 and 11 : 14 respectively. Then find total applications rejected of offline mode in these two exams is what percent of total applications rejected in SBI CLERK exam?
 (a) 45.2% (b) 47.2% (c) 54% (d) 49.2% (e) 51.2%

Directions (96-100): Table given below shows number of students appeared in preliminary examination of an exam 'ASK' in six different cities and percentage of students failed in preliminary, mains and in only reasoning. Those students who cleared the Preliminary examination can give the Mains examination. In Mains examination of ASK, there are only two subjects i.e. Reasoning and Quant. Student has to clear both the subjects to pass in Mains examination of 'ASK'.

	Students appeared in Preliminary exam	Students Failed in Preliminary exam (in %)	Students Failed in Mains examination (in %)	Students Failed in only Reasoning (in %)
A	96,000	25%	87.5%	25%
B	80,000	40%	75%	37.5%
C	1,20,000	35%	80%	$16\frac{2}{3}\%$
D	1,60,000	15%	75%	25%
E	1,25,000	28%	70%	40%
F	72,000	$33\frac{1}{3}\%$	68.75%	25%

96. Total number of students who failed only in Quant in City 'A' is three times of total number of students passed the mains exams in city 'B' while total number of students who failed in both subjects in City 'B' is 3000 less than total number of students who failed in both subjects in city 'A'. Find number of students who failed only in Quant in city 'A' is what percent more than number of students who failed in Reasoning in city 'B'?
 (a) 250% (b) 50% (c) 150% (d) 200% (e) 100%
97. In city D, total number of students who failed in Reasoning is 'x' more than total number of students who failed in only Quant. If total number of students who passed in mains exam in city D is 'x' then find the ratio between total number of students who failed in Reasoning to total number of students who failed in only Quant in city 'D'.
 (a) 1 : 3 (b) 3 : 1 (c) 1 : 1 (d) 1 : 2 (e) 2 : 1
98. Total number of students who failed in Quant in city E is how much more than total number of students who failed in Quant in city F?
 (a) 3000 (b) 6000 (c) 9000 (d) 12000 (e) 15000
99. Ratio between total number of students who failed in Quant in city 'B' to total number of students who failed in at most one subject in city 'C' is 30 : 91. Find what percent of students failed in both subject in city 'C' in mains exam?
 (a) 25% (b) 15.5% (c) 17.5% (d) 19.5% (e) 30%
100. Total number of students who failed in at most one subjects in city F is 24000 less than total number of students who failed in at least one subject in city A. Find total number of students who failed in both subjects in city 'F' is how much less than total number of students who failed in only reasoning in city 'A'.
 (a) 3000 (b) 6000 (c) 9000 (d) 12000 (e) 15000

Practice MCQs for Mains_(Solutions)

1. (a): Total number of males get loan from village P

$$= 7200 \times \frac{2}{3} \times \frac{65}{100} = 3120$$

Total females do not get loan from village P = 7200

$$\times \frac{2}{3} \times \frac{35}{100} \times \frac{10}{21} = 800$$

Total males do not get loan from village P = 7200

$$\times \frac{1}{3} - 800 = 1600$$

Total males applied for loan from village P = 3120 + 1600 = 4720

Total number of males get loan from village T

$$= 9600 \times \frac{68.75}{100} \times \frac{80}{100} = 5280$$

Total females do not get loan from village T = 9600

$$\times \frac{68.75}{100} \times \frac{20}{100} \times \frac{8}{11} = 960$$

Total males do not get loan from village T = 9600

$$\times \frac{31.25}{100} - 960 = 2040$$

Total males applied for loan from village T = 5280 + 2040 = 7320

$$\text{Required difference} = 7320 - 4720 = 2600$$

2. (e): Total females do not get loan from S = 10000

$$\times \frac{72}{100} \times \frac{24}{100} \times \frac{16}{27} = 1024$$

Total females do not get loan from Q = 8000

$$\times \frac{60}{100} \times \frac{25}{100} \times \frac{3}{5} = 720$$

$$\text{Required percentage} = \frac{1024 - 720}{720} \times 100 = \frac{304}{720} \times$$

$$100 = 42 \frac{2}{9} \%$$

3. (d): Total females do not get loan from Q = 8000

$$\times \frac{3}{5} \times \frac{25}{100} \times \frac{3}{5} = 720$$

$$\text{Total males do not get loan from Q} = 8000 \times \frac{40}{100} -$$

$$720 = 2480$$

Total females do not get loan from S = 10000

$$\times \frac{72}{100} \times \frac{24}{100} \times \frac{16}{27} = 1024$$

Total males do not get loan from S = 10000

$$\times \frac{28}{100} - 1024 = 1776$$

$$\text{Required ratio} = \frac{2480}{1776} = 155 : 111$$

4. (c): Total number of males who get loan from P = 7200

$$\times \frac{2}{3} \times \frac{65}{100} = 3120$$

Total number of males who get loan from Q = 8000

$$\times \frac{60}{100} \times \frac{3}{4} = 3600$$

Total number of males who get loan from R = 8800

$$\times \frac{9}{11} \times \frac{82}{100} = 5904$$

Total number of males who get loan from S

$$= 10000 \times \frac{72}{100} \times \frac{76}{100} = 5472$$

Total number of males who get loan from T = 9600

$$\times \frac{68.75}{100} \times \frac{80}{100} = 5280$$

Number of males(second highest) who get loan are from village S.

Total females applied for loan from village S =

$$10000 \times \frac{72}{100} \times \frac{24}{100} \times \frac{43}{27} = 2752$$

5. (e): Total females who get loan from village R = 8800

$$\times \frac{9}{11} \times \frac{18}{100} = 1296$$

Total females who do not get loan from village R =

$$= 1296 \times \frac{4}{9} = 576$$

Total males who do not get loan from village R

$$= 8800 \times \frac{2}{11} - 576 = 1024$$

$$\text{Required average} = \frac{1024 + 1296}{2} = 1160$$

6. (d): Diesel vehicles manufactured by A & Petrol vehicles manufactured by B together

$$= 800 \times \frac{40}{100} + 960 \times \frac{25}{100}$$

$$= 320 + 240$$

$$= 560$$

Diesel vehicles manufactured by D

$$= 840 \times \frac{50}{100} = 420$$

$$\text{Required percentage} = \frac{560 - 420}{420} \times 100$$

$$= \frac{140}{420} \times 100 = 33 \frac{1}{3} \%$$

7. (e): CNG vehicles manufactured by C & D together

$$= 1020 \times \frac{100 - (30 + 40)}{100} + 840 \times \frac{100 - (25 + 50)}{100}$$

$$= 306 + 210 = 516$$

Diesel vehicles manufactured by A & B together

$$= 800 \times \frac{20}{100} + 960 \times \frac{25}{100}$$

$$= 160 + 240 = 400$$

$$\text{Required ratio} = 516 : 400 = 129 : 100$$

8. (a): Diesel vehicles manufactured by E

$$= 400 \times 3 - \left[960 \times \frac{45}{100} + 1020 \times \frac{40}{100} \right]$$

$$= 1200 - (432 + 408) = 1200$$

$$- 840 = 360$$

$$\text{CNG vehicles manufactured by E} = 360 \times \frac{5}{9} = 200$$

$$\text{Petrol vehicles manufactured by E} = 1040 - (360 + 200) = 480$$

9. (d): CNG vehicles manufactured by B

$$= 960 \times \frac{100 - (25 + 45)}{100} = 288$$

CNG vehicles manufactured by D

$$= 840 \times \frac{100 - (25 + 50)}{100} = 210$$

$$\text{Required percentage} = \frac{288 - 210}{210} \times 100$$

$$= \frac{78}{210} \times 100 = 37 \frac{1}{7} \%$$

10. (c): Petrol vehicles manufactured by B

$$= 960 \times \frac{25}{100} = 240$$

Petrol vehicles manufactured by C

$$= 1020 \times \frac{30}{100} = 306$$

Petrol vehicles manufactured by D

$$= 840 \times \frac{25}{100} = 210$$

Total Petrol vehicles manufactured by B, C & D

$$= (240 + 306 + 210) = 756$$

$$\text{Required average} = \frac{756}{3} = 252$$

11. (e): Total number of students in institute A = $\frac{80}{40} \times 100 = 200$

Total number of students in institute D = $\frac{108}{30} \times 100 = 360$

Number of mentors in institute A = $\frac{200}{8} = 25$

Number of mentors in institute D = $\frac{360}{24} = 15$

$$\text{Required \%} = \frac{25-15}{25} \times 100$$

$$= \frac{10}{25} \times 100 = 40\%$$

12. (c): Number of girls after increment = $90 \times 1.6 = 144$

Number of boys after increment = $\frac{90}{36} \times 64 \times \frac{135}{100} = 216$

$$\frac{135}{100} = 216$$

Number of students under one mentor after increment = $25 \times 1.2 = 30$

Total number of mentors required after increment = $\frac{144+216}{30}$

$$= \frac{360}{30} = 12$$

Total number of mentors before increment

$$= \frac{90 + \frac{90}{36} \times 64}{25}$$

$$= \frac{90+160}{25} = \frac{250}{25} = 10$$

Number of mentors more required = $12 - 10 = 2$

13. (d): Total number of students in institute B & C together

$$= \frac{144}{32} \times 100 + \frac{176}{55} \times 100 = 450 + 320$$

$$= 770$$

Total number of students in institute D & E together

$$= \frac{108}{30} \times 100 + \frac{90}{36} \times 100$$

$$= 360 + 250$$

$$= 610$$

Required difference = $770 - 610 = 160$

14. (b): Total number of students in institute C = $\frac{176}{55} \times 100$

$$= 320$$

Number of mentors in institute C = $\frac{320}{16} = 20$

Male mentors in institute C = $20 \times \frac{35}{100} = 7$

15. (d): Total number of students in institute F = $\frac{108}{30} \times$

$$100 \times \frac{115}{100}$$

$$= 414$$

Total number of students under one mentor in institute F = $15 \times 1.2 = 18$

Number of mentors required in institute F = $\frac{414}{18}$

$$= 23$$

16. (c): Rice imported by India in 2017

$$= \frac{120}{100} \times 120 = 144 \text{ MT}$$

Tea imported by India in 2017

$$= \frac{144}{2} \times 1 = 72 \text{ MT}$$

Export of India in 2017 = $5000 + 240 = 5240 \text{ MT}$

Import of India in 2016

$$= 120 + \frac{72}{40} \times 100$$

$$= 300$$

Required sum = $5240 + 300$

$$= 5540$$

17. (a): Total import of Japan in 2016

$$= \frac{30}{100} \times 2735 = 820.5 \text{ MT}$$

Let import of Rice in 2016 is 'x' MT

So Import of Tea in 2016 $\rightarrow 820.5 - x \text{ MT}$

ATQ,

$$\frac{180 \times x}{100 \times (820.5 - x)} = \frac{360}{347}$$

$$x = 300$$

rice imported by Japan in 2017 = $\frac{180}{100} \times 300$

$$= 540$$

18. (c): Let Rice import in 2016 and tea import in 2017 of each countries is x and y respectively.

Let Rice and Tea imported by China in 2016 is 5a & 7a

ATQ,

$$x = 5a$$

$$y = \frac{7a \times 40}{100} = \frac{28a}{10} = 2.8a$$

Total rice imported in 2017

$$\Rightarrow \frac{5a \times 120}{100} + \frac{5a \times 110}{100} + \frac{5a \times 80}{100} + \frac{5a \times 100}{100} + \frac{5a \times 90}{100} + \frac{5a \times 180}{100}$$

$$\Rightarrow 6a + 5.5a + 4a + 5a + 4.5a + 9a = 34a$$

Total tea imported in 2016

$$= \frac{2.8a}{40} \times 100 + \frac{2.8a}{70} \times 100 + 7a + \frac{2.8a}{140} \times 100 +$$

$$\frac{2.8a}{125} \times 100 + \frac{2.8a}{100} \times 100$$

$$= 7a + 4a + 7a + 2a + 2.24a + 2.8a$$

$$= 25.04a$$

$$\text{Required ratio} \Rightarrow \frac{34a}{25.04a} = \frac{425}{313}$$

19. (d): Total export by US = 3860 MT
 Total export by Brazil = 4210 MT
 $\text{Required}\% = \frac{4210-3860}{4210} \times 100$
 $= \frac{350}{4210} \times 100 = \text{approximately } 8\%$

20. (e): Export of rice of India in 2016
 $= \frac{5000}{125} \times 100 = 4000 \text{ MT}$
 Export of Rice of India in 2018
 $= \frac{5000 \times 106}{100} = 5300 \text{ MT}$
 Increased export = 1300 MT
 China export tea to Brazil in 2017
 $= \frac{220 \times 50}{100} = 110 \text{ MT}$
 Tea imported by Brazil in 2016
 $= \frac{110}{125} \times 100$
 $= 88 \text{ MT}$
 $\text{Required}\% = \frac{1300}{88} \times 100$
 $= 1477 \frac{3}{11} \%$
 $= 1477 \frac{3}{11} \%$

21. (c): Unconsumed wheat in Delhi, Kerala and Haryana together
 $= \left(4,000 \times \frac{100-60}{100}\right) + \left(2,000 \times \frac{100-80}{100}\right) + \left(8,000 \times \frac{100-50}{100}\right)$
 $= 1,600 + 400 + 4,000$
 $= 6,000 \text{ tonnes}$
 Unconsumed bajra in Kerala, Haryana & Gujarat together
 $= \left(5,000 \times \frac{100-90}{100}\right) + \left(2,000 \times \frac{100-75}{100}\right) + \left(7,500 \times \frac{100-60}{100}\right)$
 $= 500 + 500 + 3,000$
 $= 4,000 \text{ tonnes}$
 $\text{Required}\% = \frac{6,000-4,000}{4,000} \times 100$
 $= 50\%$

22. (e): Average of consumed rice in Kerala, Haryana and Gujarat
 $= \frac{1}{3} \times \left(\left(4,000 \times \frac{80}{100}\right) + \left(5,000 \times \frac{40}{100}\right) + \left(2,500 \times \frac{20}{100}\right)\right)$
 $= \frac{1}{3} \times (3,200 + 2,000 + 500)$
 $= 1,900 \text{ tonnes}$
 Average of wheat produced in these 5 states
 $= \frac{1}{5} \times (4,000 + 6,000 + 2,000 + 8,000 + 4,500)$
 $= 4,900 \text{ tonnes}$
 Required difference = 4,900 – 1,900
 $= 3,000 \text{ tonnes}$

23. (a): Consumed bajra in Delhi, Rajasthan & Gujarat together
 $= \left(3,000 \times \frac{80}{100}\right) + \left(9,000 \times \frac{40}{100}\right) + \left(7,500 \times \frac{60}{100}\right)$
 $= 2,400 + 3,600 + 4,500 = 10,500 \text{ tonnes}$

Consumed wheat in Delhi, Haryana and Gujarat together
 $= \left(4,000 \times \frac{60}{100}\right) + \left(8,000 \times \frac{50}{100}\right) + \left(4,500 \times \frac{80}{100}\right)$
 $= 2,400 + 4,000 + 3,600$
 $= 10,000 \text{ tonnes}$
 $\text{Required}\% = \frac{10,500}{10,000} \times 100$
 $= 105\%$

24. (b): Unconsumed rice in all these 5 states together
 $= \left(2,000 \times \frac{100-90}{100}\right) + \left(1,500 \times \frac{100-60}{100}\right) + \left(4,000 \times \frac{100-80}{100}\right) + \left(5,000 \times \frac{100-40}{100}\right) + \left(2,500 \times \frac{100-20}{100}\right)$
 $= 200 + 600 + 800 + 3,000 + 2,000$
 $= 6,600 \text{ tonnes}$
 Total bajra produced by Rajasthan and Haryana together = 9,000 + 2,000
 $= 11,000 \text{ tonnes}$
 Required difference = 11,000 – 6,600
 $= 4,400 \text{ tonnes}$

25. (b): Consumed bajra in Kerala and Haryana together =
 $\left(5,000 \times \frac{90}{100}\right) + \left(2,000 \times \frac{75}{100}\right)$
 $= 4,500 + 1,500$
 $= 6,000 \text{ tonnes}$
 Unconsumed bajra in Delhi and Rajasthan together
 $= \left(3,000 \times \frac{100-80}{100}\right) + \left(9,000 \times \frac{100-40}{100}\right)$
 $= 600 + 5,400$
 $= 6,000 \text{ tonnes}$
 $\text{Required ratio} = \frac{6,000}{6,000}$
 $= 1:1$

26. (d): female who are using Ola in sector-15 = 4800 ×
 $\frac{85}{100} \times \frac{9}{17} \times \frac{2}{5} = 864$
 total population who are using Rapido in sector-24 = 4000 × $\frac{25}{100} = 1000$
 $\text{Required percentage} = \frac{864}{1000} \times 100 = 86.4 \%$

27. (b): Total population who are using Rapido in sector-22 and sector-12 together = 3600 × 0.1 + 2400 × 0.12 = 360 + 288 = 648
 total population who are using Uber in sector-24 = 4000 × $\frac{75}{100} \times \frac{2}{5} = 1200$
 Required difference = 1200 – 648 = 552

28. (e): total population = 2400 × $\frac{88}{100} \times \frac{6}{11} + 3000 \times \frac{80}{100} \times \frac{3}{8} + 4000 \times \frac{75}{100} \times \frac{3}{5}$
 $= 3852$
 $\text{Required average} = \frac{3852}{3} = 1284$

29. (c): Total population who are using Uber in sector-15 and sector-20 together = $4800 \times \frac{85}{100} \times \frac{8}{17} + 3000 \times 0.8 \times \frac{5}{8} = 3420$
 total population using Rapido in these two sectors = $4800 \times \frac{15}{100} + 3000 \times 0.2 = 1320$
 required % = $\frac{3420-1320}{1320} \times 100 = 159\frac{1}{11}\%$

30. (b): Required ratio

$$= \frac{4800 \times \frac{15}{100} + 3000 \times \frac{20}{100} + 4000 \times \frac{25}{100}}{2400} = \frac{2320}{2400} = 29:30$$

31. (c): Let the total number of people who have prime membership from Noida and Kanpur be $100x$ and $100y$ respectively

ATQ,

$$100x \times \frac{40}{100} \times \frac{75}{100} = 1800$$

$$\Rightarrow x = 60.$$

and,

$$100y \times \frac{65}{100} \times \frac{40}{100} = 1300$$

$$y = 60$$

$$\text{required total} = 60 \times 100 + 50 \times 100 = 11000$$

32. (e): Let the total number of people who have prime membership from Gurgaon be $100x$.

ATQ,

$$100x \times \frac{45}{100} \times \frac{1}{3} = 1200$$

$$\Rightarrow x = 80$$

$$\text{required number of females} = 8000 \times \frac{55}{100} \times \frac{30}{100} = 1320.$$

33. (a): Let the number of people having prime membership from Delhi and Jaipur be $300x$ & $200x$ respectively.

and, number of females who takes new membership from Delhi and Jaipur be y in each city.

ATQ,

$$\left(300x \times \frac{40}{100} - y\right) - \left(200x \times \frac{55}{100} - y\right) = 300$$

$$\Rightarrow 120x - 110x = 300$$

$$\Rightarrow x = 30.$$

Number of people from Delhi = 9000

Number of people from Jaipur = 6000

$$\text{required number of females} = 9000 \times \frac{60}{100} \times \frac{40}{100} +$$

$$6000 \times \frac{45}{100} \times \frac{50}{100}$$

$$= 2160 + 1350$$

$$= 3510$$

34. (d): Number of people who have amazon prime membership from Kanpur

$$= \frac{4680}{60} \times 100 \times \frac{100}{65} = 12000.$$

Required number of females

$$= 12000 \times \frac{35}{100} \times \frac{3}{7} = 1800$$

35. (c): Let the total number of people who have amazon prime membership from Delhi be $100x$.

Females who renewed their membership

$$= 100x \times \frac{60}{100} \times \frac{40}{100} = 24x$$

Total people who took new membership from Delhi = $100x \times \frac{40}{100} = 40x$

Total male who took new membership = $24x$

$$\text{Required \%} = \frac{40x-24x}{100} \times 100 = 16\%$$

36. (e): ATQ,

$$\text{Revenue of company - Q in 2016} = 30,00,000 \times \frac{150}{100}$$

$$= \text{Rs. } 45,00,000$$

$$\text{Cost of company - Q in 2016} = 45,00,000 \times \frac{100}{150}$$

$$= \text{Rs. } 30,00,000$$

Now, revenue of company - P in 2016

$$= 30,00,000 \times \frac{100}{120} \times \frac{3}{5} \times \frac{500}{300} \times \frac{160}{100}$$

$$= \text{Rs. } 40,00,000$$

$$\text{And, cost of company - P in 2016} = 40,00,000 \times \frac{100}{160}$$

$$= \text{Rs. } 25,00,000$$

$$\text{Required amount} = 25,00,000 + 30,00,000$$

$$= \text{Rs. } 55,00,000$$

$$= \text{Rs. } 55 \text{ lacs}$$

37. (a): ATQ,

$$\text{Revenue of company - P in 2015} = 60,00,000 \times \frac{100}{160}$$

$$= \text{Rs. } 37,50,000$$

$$\text{Revenue of company - P in 2014} = 37,50,000 \times \frac{300}{500}$$

$$= \text{Rs. } 22,50,000$$

$$\text{Revenue of company - Q in 2015} = 22,50,000 \times \frac{5}{3} \times \frac{120}{100}$$

$$= \text{Rs. } 45,00,000$$

$$\text{Revenue of company - Q in 2016} = 45,00,000 \times \frac{150}{100}$$

$$= \text{Rs. } 67,50,000$$

Required difference

$$= \frac{45,00,000 + 67,50,000}{2} - \frac{37,50,000 + 22,50,000}{2}$$

$$= 56,25,000 - 30,00,000 = \text{Rs. } 26.25 \text{ lacs}$$

38. (c): Let revenue of company - P in 2014 be Rs. $300x$

ATQ,

$$\left(300x \times \frac{500}{300}\right) + \left(300x \times \frac{500}{300} \times \frac{160}{100} \times \frac{125}{100}\right) = 600000$$

$$500x + 1000x = 600000$$

$$x = 400$$

$$\text{Now, revenue of company - Q in 2016} = \left((300 \times 400) \times \frac{5}{3} \times \frac{120}{100} \times \frac{150}{100}\right)$$

$$= \text{Rs. } 3,60,000$$

$$\text{Required cost} = 3,60,000 \times \frac{100}{120}$$

$$= \text{Rs. } 3,00,000 = \text{Rs. } 3 \text{ lacs}$$

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39. (b): Let revenue of company – P in 2014 be Rs.300x
 So, revenue of company – Q in 2014 = $300x \times \frac{5}{3}$
 = Rs.500x
 Now, revenue of company – Q in 2018 = $500x \times \frac{120}{100} \times \frac{150}{100} \times \frac{400}{300} \times \frac{125}{100}$
 = Rs. 1500x
 And, revenue of company – P in 2017 = $300x \times \frac{500}{300} \times \frac{160}{100} \times \frac{125}{100}$
 = Rs. 1000x
 Required % = $\frac{1500x - 1000x}{1000x} \times 100$
 = 50%

40. (e): Let revenue of company – P in 2014 be Rs.300x
 So, revenue of company – Q in 2014 = $300x \times \frac{5}{3}$
 = Rs.500x
 And, revenue of company – Q in 2016 = $500x \times \frac{120}{100} \times \frac{150}{100}$
 = Rs.900x
 And, revenue of company – P in 2017 = $300x \times \frac{500}{300} \times \frac{160}{100} \times \frac{125}{100}$
 = Rs.1000x
 So, cost of company – Q in 2016 = $900x \times \frac{100}{125}$
 = Rs. 720x
 And, cost of company – P in 2017 = $1000x \times \frac{100}{125}$
 = Rs. 800x
 ATQ,
 $800x - 720x = 20000$
 $x = 250$
 Required revenue = 500x
 = Rs. 1,25,000
 = Rs. 1.25 lacs

41. (d): Let revenue of company – P in 2014 be Rs.300x
 So, revenue of company – Q in 2014 = $300x \times \frac{5}{3}$
 = Rs.500x
 So, revenue of company – Q in 2019 = $500x \times \frac{120}{100} \times \frac{150}{100} \times \frac{400}{300} \times \frac{125}{100} \times \frac{140}{100}$
 = Rs. 2100x
 And, revenue of company – P in 2016 = $300x \times \frac{500}{300} \times \frac{160}{100}$
 = Rs. 800x
 Required ratio = $\frac{2100x}{800x}$
 = 21:8

42. (b): Total survey in Hyderabad = x
 ATQ—

$$x \times \frac{100 - (20 + 40)}{100} \times \frac{15}{28} = 6000$$

$$x \times \frac{40}{100} \times \frac{15}{28} = 6000$$

$$x = 28000$$

Total male in survey go with 'BJP' from Hyderabad

$$= 28000 \times \frac{20}{100} \times \frac{5}{7}$$

$$= 4000$$

Let total survey in Delhi = y

$$y \times \frac{32}{100} \times \frac{7}{16} = 3360$$

$$y = 24000$$

Total male in survey go with 'BJP' from Delhi

$$= 24000 \times \frac{48}{100} \times \frac{5}{8}$$

$$= 7200$$

$$\text{Required percentage} = \frac{7200 - 4000}{4000} \times 100$$

$$= \frac{3200}{4000} \times 100$$

$$= 80\%$$

43. (e): Let total survey in Mumbai = n

ATQ—

$$n \times \frac{36}{100} \times \frac{5}{12} = 5400$$

$$n = 36000$$

Total male in survey go with 'other parties' from Mumbai

$$= 36000 \times \frac{40}{100} \times \frac{11}{18}$$

$$= 8800$$

Let total survey in Bangalore = m

$$m \times \frac{32}{100} \times \frac{5}{12} = 6400$$

$$m = 48000$$

Total male in survey go with 'BJP' from Bangalore

$$= 48000 \times \frac{32}{100} \times \frac{7}{12}$$

$$= 8960$$

$$\text{Required ratio} = \frac{8800}{8960} = 55 : 56$$

44. (c): Let total survey in Mumbai and Kolkata be 2x and x respectively

$$2x \times \frac{24}{100} \times \frac{3}{4} - x \times \frac{40}{100} \times \frac{7}{9} = 880$$

$$\frac{81x - 70x}{225} = 880$$

$$x = 18000$$

$$2x = 36000$$

$$\text{Required difference} = 36000 - 18000 = 18000$$

45. (e): Let total survey from Delhi, Mumbai and Kolkata be x, y and z respectively

$$\text{Total survey from Delhi} = x \times \frac{32}{100} \times \frac{9}{16} = 4320$$

$$x = \frac{4320 \times 100}{18} = 24000$$

Total survey from Mumbai

$$y \times \frac{36}{100} \times \frac{7}{12} = 7560$$

$$y = \frac{7560 \times 100}{21}$$

$$y = 36000$$

Total survey from Hyderabad

$$z \times \frac{40}{100} \times \frac{5}{8} = 7000$$

$$z = \frac{7000 \times 100 \times 8}{40 \times 5}$$

$$z = 28000$$

Total male in survey go with 'BJP' from Delhi, Mumbai & male go with 'other' parties from Hyderabad

$$= 24000 \times \frac{48}{100} \times \frac{5}{8} + 36000 \times \frac{24}{100} \times \frac{3}{4} + 28000 \times \frac{40}{100} \times \frac{15}{28}$$

$$= 7200 + 6480 + 6000$$

$$= 19680$$

$$\text{Required average} = \frac{19680}{3} = 6560$$

- 46. (c):** Due to new technology per day production for each factory will be 3 units

$$\text{Total profits earned by C} = 27 \times (3000 - 1500 - 150 - 500) = \text{Rs } 22,950$$

$$\text{Total profits earned by D} = 30 \times (4800 - 1800 - 225 - 625) = \text{Rs } 64,500$$

$$\text{Total profits earned by A} = 28 \times (3600 - 1200 - 120 - 375) = \text{Rs } 53,340$$

$$\text{Total profits earned by B} = 25 \times (4500 - 1800 - 180 - 750) = \text{Rs } 44,250$$

$$\text{Required \%} = \frac{(53340 + 44250) - (64500 + 22950)}{53340 + 44250} \times 100 = 10\%$$

- 47. (b):** To deliver 80 units of Earphone within 20 days, company has to use at least two factories for production.

It is clear that the factories used to produce required quantities will work for 20 days max.

So, Company will use factories with maximum profit after ignoring selling cost/unit

Required options- Factory A & Factory D

48. (d): Sales margin for B = $\frac{4}{25}$

Sales margin for C = $\frac{1}{20}$

Sales margin for D = $\frac{17}{64}$

Sales margin for E = $\frac{3}{8}$

Order = E > D > B > C

- 49. (e):** Total units of earphone produced by factory A = 56

$$\text{Increment in Raw material cost} = 56 \times 400 \times \frac{4.5}{100} = \text{Rs } 1008$$

$$\text{Increment in labor cost in that month} = 28 \times 60 = \text{Rs } 1680$$

$$\text{Required part} = \frac{1008 + 1680}{56 \times 1200} = \frac{1}{25}$$

- 50. (b):** Every factory produces 2 units of earphone per day

$$\text{Profit/day for factory D} = \text{Rs } 1600 \times 2 - (600 \times 2 + 150 + 500) = \text{Rs } 1350$$

$$\text{Profit/day for factory B} = \text{Rs } 1500 \times 2 - (600 \times 2 + 120 + 600) = \text{Rs } 1080$$

$$\text{Required \%} = \frac{1350}{1080} \times 100 = 125\%$$

- 51. (d):** Total income of Company X in 2009

$$= \frac{108000}{40} \times 100 = \text{Rs. } 2,70,000$$

$$\text{Expenditure of X in 2009} = 2,70,000 - 1,08,000 = 1,62,000$$

$$\text{Expenditure of Y in 2009} = \frac{1,75,000}{62.5} \times 37.5 = \text{Rs. } 1,05,000$$

$$\text{Required ratio} = \frac{105000}{162000} = \frac{35}{54}$$

- 52. (a):** Let the income be Rs. x

ATQ,

$$\frac{x \times 55}{100} - \frac{x \times 40}{100} = 36000$$

$$\Rightarrow x = \text{Rs. } 2,40,000$$

$$\text{Total profit of X \& Y} = (0.6 + 0.45) \times 2,40,000 + (0.6) \times 2,40,000.$$

$$= 2,52,000 + 1,44,000$$

$$= \text{Rs. } 3,96,000$$

$$\text{Required average} = \text{Rs. } 1,32,000$$

- 53. (c):** Income of Company X in 2010 = Rs. 1,35,000 $\times 2 =$ Rs. 2,70,000

$$\text{Income of X in 2013} = \frac{2,70,000}{60} \times 100$$

$$= \text{Rs. } 4,50,000$$

$$\text{Required percentage change} = \frac{4,50,000 - 2,70,000}{2,70,000} \times 100$$

$$= 66\frac{2}{3}\%$$

- 54. (b):** Let the income of X be p in that yr. and income of Y be q in that yr.

ATQ,

$$\frac{q \times 40}{100} - \frac{p \times 75}{100} = 2500$$

$$\Rightarrow 8q - 15p = 50000$$

... (i): And,

$$\frac{25 \times p}{100} = \frac{7}{32} \times \frac{60 \times q}{100}$$

$$\Rightarrow 40p = 21q$$

... (ii): From (i)

$$\& \text{ (ii): } q = \text{Rs. } 4,00,000$$

$$p = \text{Rs. } 2,10,000$$

$$\text{Required average} = \text{Rs. } 3,05,000$$

- 55. (b):** Let the incomes of X & Y in year 2010 be p and q respectively.

ATQ,

$$\frac{9}{20}(p + q) = \frac{1}{2}p + q \times \frac{2}{5}$$

$$\Rightarrow \frac{9}{20}q - \frac{2q}{5} = \frac{1}{2}p - \frac{9}{20}p$$

$$\Rightarrow \frac{q}{20} = \frac{p}{20}$$

$$\Rightarrow q : p = 1 : 1$$

Required ratio of profit

$$= \frac{1 \times \frac{50}{100}}{1 \times \frac{60}{100}} = 5 : 6$$

56. (d): In (0-19) marks range, a student can score minimum possible marks, when its score is equal to lower limit of that range.

$$\begin{aligned} \text{So, minimum possible marks} &= (440 \times 0) + (600 \times 20) + (650 \times 40) + (540 \times 55) + (400 \times 70) + (250 \times 80) + (80 \times 90) + (10 \times 96) \\ &= (0 + 12,000 + 26,000 + 29,700 + 28,000 + 20,000 + 7,200 + 960) \\ &= 1,23,860 \end{aligned}$$

57. (a): Minimum possible average of student in VARC section

$$\begin{aligned} &= \frac{\{(0 \times 720) + (20 \times 537) + (40 \times 490) + (55 \times 560) + (70 \times 420) + (80 \times 190) + (90 \times 45) + (96 \times 8)\}}{2,970} \\ &= \frac{0 + 10,740 + 19,600 + 30,800 + 29,400 + 15,200 + 4,050 + 768}{2,970} \\ &= \frac{1,10,558}{2,970} = 37.22 \text{ (approx.):} \quad \text{Maximum} \\ &\text{possible average of student in VARC section} \\ &= \frac{\{(19 \times 720) + (39 \times 537) + (54 \times 490) + (69 \times 560) + (79 \times 420) + (89 \times 190) + (95 \times 45) + (102 \times 8)\}}{2,970} \\ &= \frac{13,680 + 20,943 + 26,460 + 38,640 + 33,180 + 16,910 + 4,275 + 816}{2,970} \\ &= \frac{1,54,904}{2,970} \end{aligned}$$

= 52.16 (approx.) So, average marks of students in VARC section ranges between 37.22 and 52.16.

58. (b): It can be seen that 720 students have scored 0 to 19 marks in VARC. The marks scored by 19 students can be different and minimum 701 students have non unique marks and so on
Minimum number of students having non unique marks = $701 + 518 + 476 + 546 + 411 + 181 + 40 + 2 = 2875$

59. (c): Total number of students who have scored more than 39 but less than 90 marks in VARC = $490 + 560 + 420 + 190 = 1660$

Total students who have scored more than 69 marks in QA section = $400 + 250 + 80 + 10 = 740$

Required ratio = 83:37

60. (c): Total production of U.P in 2001 = 9,25,000 tonnes

$$\% \text{ Contribution} = \frac{925}{5600} \times 100 = 16.52\%$$

Total production of UP in 2002 = 11,65,000 tonnes

$$\% \text{ Contribution} = \frac{1165}{6300} \times 100 = 18.49\%$$

Total production of UP in 2003 = 13,00,000 tonnes

$$\% \text{ Contribution} = \frac{1300}{6700} \times 100 = 19.40\%$$

Percentage contribution of UP is maximum in 2003.

61. (e): None of the crops showed a decline in production for two consecutive years in UP.

62. (a): Production of Bajra showed an increment for consecutive two years for India during the period 2001-2003 and it also showed decline in production in 2002 over the year 2001 for UP.

63. (b): Average of total production of Wheat, Rice and Bajra in UP in 2002

$$= \frac{450 + 440 + 90}{3} \times 1000 = \frac{9,80,000}{3} \text{ tonnes}$$

Total production of Maize in India in all the years = 12,00,000 tonnes

$$\text{Required } \% = \frac{(1200000 - \frac{980000}{3})}{1200000} \times 100 = 72.33\%$$

approx 72%

64. (a): Total passed boys from A

$$= 3600 \times \frac{2}{3} \times \frac{65}{100} = 1560$$

Total failed girls from A

$$= 3600 \times \frac{2}{3} \times \frac{35}{100} \times \frac{10}{21} = 400$$

$$\text{Total failed boys from A} = 3600 \times \frac{1}{3} - 400 = 800$$

Total boys participated from A

$$= 1560 + 800 = 2360$$

Total passed boys from E

$$= 4800 \times \frac{68.75}{100} \times \frac{80}{100} = 2640$$

Total failed girls from E

$$= 4800 \times \frac{68.75}{100} \times \frac{20}{100} \times \frac{8}{11} = 480$$

Total failed boys from E

$$= 4800 \times \frac{31.25}{100} - 480 = 1020$$

$$\text{Total boys participated from E} = 2640 + 1020 = 3660$$

$$\text{Required difference} = 3660 - 2360 = 1300$$

65. (e): Total failed girls from D = $5000 \times \frac{72}{100} \times \frac{24}{100} \times$

$$\frac{16}{27} = 512$$

Total failed girls from B

$$= 4000 \times \frac{60}{100} \times \frac{25}{100} \times \frac{3}{5} = 360$$

$$\text{Required percentage} = \frac{512 - 360}{360} \times 100$$

$$= \frac{152}{360} \times 100 = 42 \frac{2}{9} \%$$

66. (d): Total failed girls from B

$$= 4000 \times \frac{3}{5} \times \frac{25}{100} \times \frac{3}{5} = 360$$

Total failed boys from B

$$= 4000 \times \frac{40}{100} - 360 = 1240$$

Total failed girls from D

$$= 5000 \times \frac{72}{100} \times \frac{24}{100} \times \frac{16}{27} = 512$$

Total failed boys from D

$$= 5000 \times \frac{28}{100} - 512 = 888$$

$$\text{Required ratio} = \frac{1240}{888} = 155 : 111$$

67. (c): Total passed boys from A = $3600 \times \frac{2}{3} \times \frac{65}{100} = 1560$

Total passed boys from B
 $= 4000 \times \frac{60}{100} \times \frac{3}{4} = 1800$

Total passed boys from C
 $= 4400 \times \frac{9}{11} \times \frac{82}{100} = 2952$

Total passed boys from D
 $= 5000 \times \frac{72}{100} \times \frac{76}{100} = 2736$

Total passed boys from E
 $= 4800 \times \frac{68.75}{100} \times \frac{80}{100} = 2640$

Passed boys are second maximum from school D
 So,

Total girls participated from D = $5000 \times \frac{72}{100} \times \frac{24}{100} \times \frac{43}{27} = 1376$

68. (e): Passed girls from C = $4400 \times \frac{9}{11} \times \frac{18}{100} = 648$

Total failed girls from C = $648 \times \frac{4}{9} = 288$

Total failed boys from C = $4400 \times \frac{2}{11} - 288 = 512$

Required average = $\frac{512+648}{2} = 580$

69. (e): Required % = $\frac{\frac{27250 \times 100}{50}}{\frac{6250 \times (50+20)}{10}} \times 100$
 $= \frac{54500}{43750} \times 100 = 124\frac{4}{7}\%$

70. (a): Audience watching 2007 final from Australia and South Africa together

$= \frac{2250}{10} \times (50 + 20) = 15750$

Audience watching 1999 final from South Africa and West Indies

$= \frac{7250}{20} \times 60 = 21750$

Required % = $\frac{21750 - 15750}{21750} \times 100$

$= \frac{6000}{21750} \times 100 = 27.58 \approx 28$

71. (c): Required ratio = $\frac{\frac{7250}{20} \times 100}{\frac{27250}{50} \times 30 + \frac{2250}{10} \times 50}$

$= \frac{36250}{16350 + 11250}$
 $= 725 : 552$

72. (b): Required average

$= \frac{\frac{7250}{20} \times 40 + \frac{27250}{50} \times 5 + \frac{2250}{10} \times 20 + \frac{45000}{60} \times 18 + \frac{6250}{10} \times 10}{5}$

$= \frac{14500 + 2725 + 4500 + 13500 + 6250}{5}$

$= \frac{41475}{5} = 8295$

73. (a): Total female Audience watching 2003 final from England

$= \frac{27250}{50} \times \frac{13}{100} \times \frac{1}{5} = 1417$

Required difference

$= 1417 - \frac{27250}{50} \times 2$

$= 1417 - 1090 = 327$

Solutions (74-78): Total of fixed charges = Basic Charge + (Surcharge% + Taxes%) (Basic Charge): Net Unit Rate = Base Rate + (Taxes%)(Base Rate)

Billing Period		Aug 01, 2019 to Aug 31, 2019		
Fixed Charges				
Load (KW)	Charge (Rs.)	Surcharge (%)	Taxes (%)	Total (Rs.)
2	150	4	5	163.5
4	180	5	5	198
6	200	6	8	228
8	250	8	8	290
10	400	10	12	488
Consumption Charge				
Units (kWh)	Base Rate (Rs.)	Taxes (%)	Net Rate (Rs.)	
0-200	4	5	4.2	
201-400	5	5	5.25	
401-800	6.5	8	7.02	
801-1200	8	8	8.64	
Above 1200	10	10	11	

74. (e): Fixed charge for 4 KW connection = Rs. 198

Consumption Charges for 700 units = $200 \times 4.2 + 200 \times 5.25 + 300 \times 7.02 = \text{Rs. } 3996$

Total bill amount = $198 + 3996 = \text{Rs. } 4194$

75. (a): consumption charge for 800 units = $200 \times 4.2 + 200 \times 5.25 + 400 \times 7.02 = \text{Rs. } 4698$

Required average = $\frac{4698}{800} = \text{Rs. } 5.87$

76. (c): Fixed charges for 6 KW connection = Rs. 228

Consumption charges for 1400 units

$= 200 \times 4.2 + 200 \times 5.25 + 400 \times 7.02 + 400 \times 8.64 + 200 \times 11 = \text{Rs. } 10354$

Total bill amount of August month = $228 + 10354 = \text{Rs. } 10582$

% increase = $\frac{10582 - 10000}{10000} \times 100 = 5.82\%$

77. (e): fixed charges for 4 KW = Rs. 198

Fixed charges for 10 KW = Rs. 488

Required ratio = $\frac{198}{488} = 99 : 244$

78. (b): fixed charge for Deepak (6KW) = Rs. 228

Fixed charges for Ranjan (8 KW) = Rs. 290

Required average = $\frac{228+290}{2} = \text{Rs. } 259$

79. (d): CPSF for ground floor of building 'C' = Rs 4700.
 CPSF for sixth floor = $4700 + (50 \times 6) = \text{Rs } 5000$
 Price of the flat = $5000 \times 1400 = \text{Rs } 70 \text{ lakhs}$.
 Also, the customer will pay 1% commission to the agent.
 Therefore, customer has to pay total amount = 70 lakhs + 1% of (70 lakhs) = 70.7 lakhs

80. (d): Agent gets same commission when the price of the flat on different buildings is same.
 The price for a flat on the fourth floor of building 'A' is Rs. 67.2 lakhs.
 The price for a flat on the second floor of building 'C' is also Rs. 67.2 lakhs.

81. (b): The CPSF of flats on the sixth, seventh and the ninth floor of building 'B' are Rs. 4650, Rs. 4700 and Rs. 4800 respectively.
 To minimize the total cost, he will take the discount on the flat costing him the maximum i.e. on the flat on the ninth floor.
 Thus, CPSF of the flat on the ninth floor = 80% of 4800 = Rs 3840
 Total price of all the three flats = $1200 \times (4650 + 4700 + 3840) = 158.28 \text{ lakhs}$
 Total commission = 1% of 158.28 lakhs = 1.58 lakhs

82. (e): CPSF for ground floor of building 'A' = Rs 4000.
 CPSF for 7th floor = $4000 + (50 \times 7) = \text{Rs } 4350$
 Price of the flat = $4350 \times 1600 = \text{Rs } 69.6 \text{ lakhs}$.
 Commission received by the agent = 2% of 69.6 lakhs = 1.392 lakhs
 CPSF for ground floor of building 'B' = Rs 4350
 CPSF for 7th floor = $4350 + (50 \times 7) = \text{Rs } 4700$
 Price of the flat = $4700 \times 1200 = \text{Rs } 56.4 \text{ lakhs}$
 Commission received by the agent = 2% of 56.4 lakhs = 1.128 lakhs
 Required difference = Rs 26400

83. (c): Total candidates from center A = $\frac{440}{55} \times 100 = 800$
 Total candidates who completed exam from center A = $800 - 105 = 695$
 Total candidates from center D = $\frac{500}{40} \times 100 = 1250$
 Total candidates who completed exam from center D = $1250 - 90 = 1160$
 Required difference = $1160 - 695 = 465$

84. (b): Candidate who didn't completed online and offline exams from center D are equal
 Candidate who didn't completed online exams from center D = 45
 Candidate who didn't completed offline exams from center D = 45
 Candidate who completed online exams from center D = $500 - 45 = 455$
 Candidate who completed offline exams from center D = $750 - 45 = 705$

Required percentage = $\frac{705-455}{455} \times 100 \approx 55\%$ (approx.):

85. (b): Total candidate who appeared in online exams in all center $440 + 320 + 460 + 500 + 525 = 2245$
 Total candidate who appeared in offline exams in all centers = $(\frac{440}{55} \times 45) + (\frac{320}{64} \times 36) + (\frac{460}{46} \times 54) + (\frac{500}{40} \times 60) + (\frac{525}{70} \times 30) = 360 + 180 + 540 + 750 + 225 = 2055$
 Required difference = $2245 - 2055 = 190$

86. (a): Total candidate who appeared in online exams in center C and center D together = $460 + 500 = 960$
 Total candidate who appeared in offline exams in center A and center B together = $\frac{440}{55} \times 45 + \frac{320}{64} \times 36 = 360 + 180 = 540$
 Required ratio = $\frac{960}{540} = \frac{16}{9}$

87. (c): Total candidate who appeared in offline exams in center A and center B together = $\frac{440}{55} \times 45 + \frac{320}{64} \times 36 = 360 + 180 = 540$
 Total candidate who appeared in online exams in center B = 320
 Required percentage = $\frac{540}{320} \times 100 = 168.75\%$

88. (e): Let, total number of manufactured cars by TATA & HONDA in the year 2016 be $6x$ and $7x$ units respectively.

ATQ,

$$7x \times \frac{75}{100} \times \frac{(100-15)}{100} - 6x \times \frac{80}{100} \times \frac{(100-15)}{100} = 4590$$

$$7x \times \frac{75}{100} \times \frac{85}{100} - 6x \times \frac{80}{100} \times \frac{85}{100} = 4590$$

$$\frac{357x}{80} - \frac{102x}{25} = 4590$$

$$= \frac{1785x - 1632x}{400} = 4590$$

$$x = \frac{4590 \times 400}{153}$$

$$x = 12,000 \text{ units}$$

Total number of cars returned to HYUNDAI in 2017 = $(12000 \times 6) \times \frac{80}{100} \times \frac{15}{100} - 1920$
 $= 8640 - 1920$
 $= 6720$

Total number of cars returned to MARUTI SUZUKI in 2017

$$= (12000 \times 7) \times \frac{75}{100} \times \frac{15}{100} + 4830$$

$$= 9450 + 4830$$

$$= 14,280 \text{ units}$$

Let total number of cars manufactured by HYUNDAI in 2017 be x units

$$\text{So, } x \times \frac{70}{100} \times \frac{15}{100} = 6720$$

$$x = \frac{6720 \times 100 \times 100}{70 \times 15}$$

$x = 64,000$ units

Let total number of cars manufactured by MARUTI SUZUKI in 2017 be y units

So,

$$y \times \frac{85}{100} \times \frac{17.5}{100} = 14280$$

$$y = \frac{14280 \times 100 \times 100}{85 \times 17.5}$$

$y = 96,000$ units

Required difference = $96000 - 64000$
= $32,000$ units

- 89. (c):** Let total number of cars manufactured by MARUTI SUZUKI in the year 2016 be $100x$ units
So, total number of cars manufactured by TATA in 2017 be $140x$ units

ATQ,

$$140x \times \frac{75}{100} \times \frac{10}{100} - 100x \times \frac{80}{100} \times \frac{12.5}{100} = 120$$

$$\frac{21x}{2} - 10x = 120$$

$x = 240$

Total number of cars returned to HONDA in 2017

$$= (240 \times 100) \times \frac{80}{100} \times \frac{12.5}{100} + 2010$$

$$= 2400 + 2010$$

$$= 4410 \text{ units}$$

Let total number of cars manufactured by HONDA in year 2017 be x units

ATQ,

$$x \times \frac{70}{100} \times \frac{22.5}{100} = 4410$$

$$x = \frac{4410 \times 100 \times 100}{70 \times 22.5}$$

$x = 28,000$ units

- 90. (c):** Let total number of cars manufactured by HYUNDAI, MARUTI SUZUKI & HONDA in 2016 be $2y$, $3y$ and $4y$ respectively.

ATQ,

$$\frac{2y \times \frac{65}{100} \times \frac{20}{100} + 3y \times \frac{80}{100} \times \frac{12.5}{100} + 4y \times \frac{75}{100} \times \frac{15}{100}}{3} = 4040$$

$$\frac{13y}{50} + \frac{3y}{10} + \frac{9y}{20} = 12120$$

$$101y = 1212000$$

$$y = 12,000$$

Required average

$$= \frac{(12000 \times 2) \times \frac{120}{100} + (12000 \times 3) \times \frac{125}{100} + (12000 \times 4) \times \frac{112.5}{100}}{3}$$

$$= \frac{28800 + 45000 + 54000}{3}$$

$$= \frac{127800}{3}$$

$$= 42,600$$

- 91. (d):** Let total number of cars manufactured by HYUNDAI & HONDA in the year 2016 be $8x$ and $9x$ units respectively.

ATQ,

$$8x \times \frac{65}{100} \times \frac{(100-20)}{100} + 9x \times \frac{75}{100} \times \frac{(100-15)}{100} = 39590$$

$$\frac{104x}{25} + \frac{459x}{80} = 39590$$

$$\frac{3959x}{400} = 39590$$

$x = 4,000$ units

Total number of cars manufactured by HONDA in 2017 = $\frac{36000}{3} \times 5$

$$= 60,000$$

Total number of cars manufactured by HYNDUAI in 2017 = $\frac{32000}{2} \times 3$

$$= 48,000$$

$$\text{Required percentage} = \frac{60000 - 48000}{48000} \times 100$$

$$= \frac{12000}{48000} \times 100$$

$$= 25\%$$

- 92. (a):** Total applications in RRB PO exam = $15000 \times \frac{100}{24} = 62500$

$$\text{Total applications in SBI CLERK exams} = 52500 \times \frac{100}{42} = 125000$$

Total applications rejected of online mode in RRB PO & SBI CLERK exam

$$= 62500 \times \frac{15}{100} \times \frac{2}{5} + 125000 \times \frac{16}{100} \times \frac{3}{10}$$

$$= 3750 + 6000$$

$$= 9750$$

Total applications rejected of offline mode in RRB PO & SBI CLERK exam

$$= 62500 \times \frac{15}{100} \times \frac{3}{5} + 125000 \times \frac{16}{100} \times \frac{7}{10}$$

$$= 5625 + 14000$$

$$= 19625$$

$$\text{Required difference} = 19625 - 9750$$

$$= 9875$$

- 93. (e):** Total applicants appeared in SBI PO exam = $\frac{22500}{48} \times 100 \times \frac{96}{100} \times \frac{90}{100} = 40500$

Total applicants appeared in IBPS PO exam

$$= \frac{31500}{36} \times 100 \times \frac{80}{100} \times \frac{96}{100}$$

$$= 67200$$

$$\text{Required percentage} = \frac{67200 - 40500}{67200} \times 100$$

$$= 39 \frac{41}{56}\%$$

- 94. (d):** Total appeared applicants who get final selection in RRB PO exam

$$= 15000 \times \frac{100}{24} \times \frac{85}{100} \times \frac{80}{100} \times \frac{1.8}{100}$$

$$= 765$$

Total appeared applicants who get final selection in IBPS CLERK exam

$$= \frac{51750}{46} \times 100 \times \frac{80}{100} \times \frac{95}{100} \times \frac{2}{100}$$

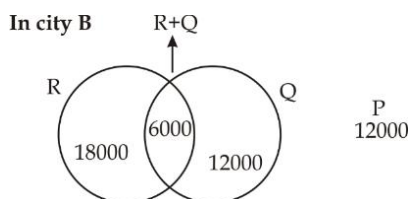
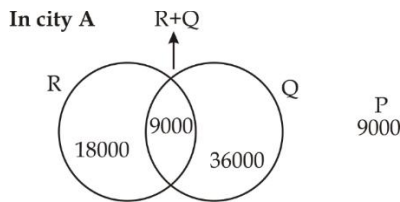
$$= 1710$$

$$\text{Required sum} = 765 + 1710 = 2475$$

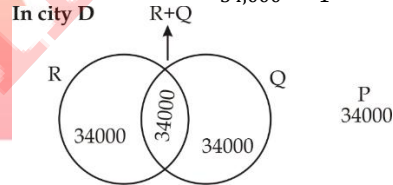
- 95. (c):** Total applications rejected of offline mode in SBI PO exam
 $= 22500 \times \frac{100}{48} \times \frac{4}{100} \times \frac{8}{15} = 1000$
 Total applications rejected of offline mode in IBPS PO exam
 $= 31500 \times \frac{100}{36} \times \frac{20}{100} \times \frac{14}{25} = 9800$
 Required sum = $1000 + 9800 = 10800$
 Total applications rejected in SBI CLERK exam
 $= 52500 \times \frac{100}{42} \times \frac{16}{100} = 20000$
 Required percentage = $\frac{10800}{20000} \times 100 = 54\%$

- 96. (b):** In city A,
 Number of students appeared in mains exam
 $= 96000 \times \frac{75}{100} = 72000$
 Number of students passed in mains exam
 $= 72000 \times \frac{12.5}{100} = 9000$
 In city B,
 Number of students appeared in mains exam =
 $80,000 \times \frac{60}{100} = 48000$
 Number of students passed in mains exam =
 $48000 \times \frac{25}{100} = 12000$
 Total number of students who failed only in quant in city A = 3×12000
 $= 36000$
 Total number of students who failed in both subjects in city 'A'
 $= 72000 - 9000 - 36000 - 72000 \times \frac{25}{100} = 9000$
 Total number of students who failed in both exam in city 'B' = $9000 - 3000$
 $= 6000$
 Total number of students who failed in Reasoning
 $= 48000 \times \frac{37.5}{100} + 6000$
 $= 18000 + 6000$
 $= 24000$
 Required % = $\frac{36000 - 24000}{24000} \times 100 = 50\%$

Vein diagram for failed students:-



- 97. (e):** In city D,
 Number of students appeared in mains exam =
 $1,60,000 \times \frac{85}{100} = 1,36,000$
 Number of students passed in mains exam =
 $1,36,000 \times \frac{25}{100} = 34,000 = x$
 Total number of students who failed in reasoning
 $= 34,000 + x$
 Total number of students who failed in Quant =
 $1,36,000 \times \frac{75}{100} - 34,000 = 68,000$
 Let Total number of students who failed in only Quant = a
 And
 Let Total number of students who failed in both subjects = b
 ATQ,
 $a + b = 68,000$
 And $34,000 + b = a + 34,000$
 So $a = b = 34,000$
 Total number of students who failed in Reasoning
 $= 34,000 + 34,000 = 68,000$
 Total number of students who failed in only Quant
 $= 34,000$
 Required Ratio = $\frac{68,000}{34,000} = \frac{2}{1}$



- 98. (b):** Total number of students who failed in Quant in city 'E' = Total number of students who failed in Mains exam - Total number of students who failed in only Reasoning
 $= 1,25,000 \times \frac{72}{100} \times \frac{70-40}{100} = 27,000$
 Total number of students who failed in Quant in city 'F' = Total number of students who failed in Mains exam - Total number of students who failed in only Reasoning
 $= 72,000 \times \frac{2}{3} \times \frac{68.75-25}{100} = 21,000$
 Required difference = $27,000 - 21,000 = 6,000$

- 99. (e):** Total number of students who failed in Quant in city 'B' = $80,000 \times \frac{60}{100} \times \frac{75-37.5}{100} = 18,000$
 Total number of students who failed in at most one subject in city 'C' = $\frac{18,000}{30} \times 91 = 54,600$
 In city 'C'
 Total number of students who failed in at most one subject in city 'C' = Total number of students who failed in Reasoning only + Total number of students who failed in only Quant + Total number of students who passed in both subjects

Total number of students who passed in both subjects = $1,20,000 \times \frac{65}{100} \times \frac{20}{100} = 15,600$

Total number of students who failed in only Reasoning = $1,20,000 \times \frac{65}{100} \times \frac{50}{300} = 13,000$

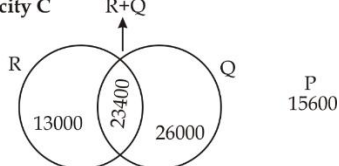
Total number of students who failed in only Quant = $54,600 - 15,600 - 13,000 = 26,000$

Total number of students who failed in Quant = $120,000 \times \frac{65}{100} \times \left[\frac{80}{100} - \frac{50}{300} \right] = 49,400$

Total number of students who failed in both exams = $49,400 - 26,000 = 23,400$

Required % = $\frac{23,400}{78,000} \times 100 = 30\%$

In city C



100. (c): Total number of students who failed in at least one subject in city 'A'

$$= 96,000 \times \frac{75}{100} \times \frac{87.5}{100} = 63,000$$

Total number of students who failed in at most one subject in city 'F' = $63,000 - 24,000 = 39,000$

Total number of students who failed in only Quant in city 'F'

$$= 39,000 - 72,000 \times \frac{2}{3} \times \frac{31.25+25}{100} = 12,000$$

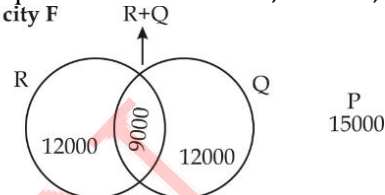
Total number of students who failed in both subjects = $72,000 \times \frac{2}{3} \times \frac{68.75-25}{100} = 12,000$

$$= 21,000 - 12,000 = 9,000$$

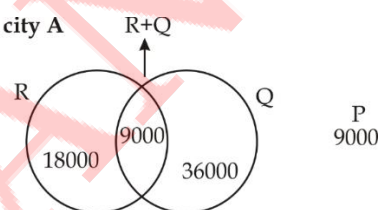
Total number of students who failed in only reasoning in city 'A' = $96,000 \times \frac{75}{100} \times \frac{25}{100} = 18,000$

$$\text{Required difference} = 18,000 - 9,000 = 9,000$$

In city F



In city A



Previous Years' Questions of Prelims

Direction (1 -5): Table given below shows number of orders received by three (P, Q & R) companies of their three (A, B & C) items. Read the data carefully and answer the questions.

Companies	A	B	C
P	80	60	50
Q	40	70	90
R	80	100	30

- Total orders of item A & B received by R is how much more than total orders of item B & C received by Q?
(a) 50 (b) 10 (c) 40 (d) 20 (e) 30
- Find total orders (all three items) received by R is what percent more than that of total orders (all three items) received by Q?
(a) 5% (b) 12.5% (c) 10% (d) 15% (e) 20%
- Find ratio of total orders of item A & B received by P to total orders of item B & C received by Q?
(a) 7 : 9 (b) 8 : 7 (c) 4 : 7 (d) 5 : 6 (e) 7 : 8
- Find average number of orders of item B received by Q & R is what percent of total orders of item A received by P?
(a) $104\frac{1}{4}\%$ (b) $106\frac{1}{4}\%$ (c) $108\frac{1}{4}\%$ (d) $102\frac{1}{4}\%$ (e) $110\frac{1}{4}\%$
- Find total orders of item A, B & C received by P?
(a) 210 (b) 210 (c) 190 (d) 180 (e) 200

Directions (6-10): Table given below gives information about no. of article sold by four different people (A, B, C and D) in four different months (March, April, May and June)

Person/month	March	April	May	June
A	153	121	90	92
B	102	85	140	117
C	80	124	118	51
D	90	113	112	85

6. No. of article sold by person A in May month are what percent of total no. of article sold by person D in all months?
 (a) 20% (b) 12.5% (c) 22.5% (d) 37.8% (e) 28.28%
7. What is the ratio of no. of article sold by person A and C in April together to no. of article sold by person B in May month?
 (a) 7:4 (b) 2:7 (c) 7:11 (d) 5:11 (e) None of these.
8. What is the difference between average no. of article sold by person B and person D in all four months?
 (a) 21 (b) 19 (c) 24 (d) 18 (e) 11
9. Total no. of article sold by A and B together in June are how much more or less than total no. of article sold by C and D together in April month?
 (a) 32 (b) 39 (c) 33 (d) 28 (e) 22
10. No. of article sold by C in June are how much percent more/less than no. of article sold by B in April?
 (a) 40% more (b) 66.67% less (c) 66.67% more (d) 40% less (e) 20% less

Directions (11-15): Given below table shows the number of cakes of five different types sold by a shopkeeper on four different days. Study the data and answer the questions that follow:

Days/Type of Cake	A	B	C	D	E
Saturday	25	28	35	50	38
Sunday	35	65	48	42	47
Monday	38	60	40	24	29
Tuesday	46	54	55	44	30

11. What is the ratio of no. of cakes of type B sold by the shopkeeper on Saturday and Monday together to the no. of cakes of type E sold by him on the same days?
 (a) 72:53 (b) 88:67 (c) 98:73 (d) 92:71 (e) 90:67
12. What is average no. of cakes of type C sold by shopkeeper on Saturday, Sunday and Tuesday?
 (a) 38 (b) 40 (c) 42 (d) 44 (e) 46
13. The no. of cakes of type D and E sold together on Tuesday is what percent of the no. of cakes of type A & B sold together on Sunday?
 (a) 72% (b) 75% (c) 74% (d) 78% (e) 80%
14. What is the difference between the total no. of cakes of all the given types sold by shopkeeper on Monday and the total no. of cakes of all the given types sold by shopkeeper on Tuesday?
 (a) 38 (b) 44 (c) 42 (d) 40 (e) 45
15. If the no. of cakes of type F sold by the shopkeeper in given four days is 25% more than the no. of cakes sold of type D in all the given days, then find the no. of cakes sold of type F in all the given days.
 (a) 164 (b) 160 (c) 180 (d) 200 (e) 240

Directions (16-20): Table given below shows the number of male and female participated in an event from five different schools (A, B, C, D & E). Study the table carefully and answer the following questions.

Schools	Male	Female
A	650	450
B	540	420
C	720	500
D	560	450
E	680	320

16. Find average number of females participated from school – A, B & D.
 (a) 400 (b) 380 (c) 350 (d) 440 (e) 450
17. Total male participated from school – B & D together are how much more or less than total female participated from school – A & C together?
 (a) 150 (b) 110 (c) 170 (d) 120 (e) 240
18. Total male participated from school – B & C together are what percent more or less than total female participated from school – A & D together?
 (a) 20% (b) 60% (c) 50% (d) 40% (e) 30%
19. If total male participated from school – F are 40% more than that of from school – A and ratio of female participated from school – B to that of from school – F is 21:32, then find total students participated from school – F.
 (a) 1420 (b) 1550 (c) 1580 (d) 1460 (e) 1490
20. Find total number of male students participated from all the five schools together.
 (a) 2860 (b) 3150 (c) 2940 (d) 3200 (e) 3020

Directions (21-25):- Given table shows the data of population in 5 different parks. Study the data carefully and answer the questions.

Parks	Total Population	Female population
A	400	150
B	500	200
C	700	350
D	800	450
E	900	500

(Total population = Male population + Female population)

21. If 20% of total population did not visit on a particular day in park A of which male population was 60% then what percent of total population in park B is male population who visited in park A?
 (a) 45% (b) 40.4% (c) 39.2% (d) 48.6% (e) None of these
22. What is average of male population in park B, C and D?
 (a) 343.33 (b) 313.33 (c) 323.33 (d) 333.33 (e) 353.33
23. By what percent female population in park D is more or less than the male population in park E?
 (a) 15% (b) 9.09% (c) 11.11% (d) 14.28% (e) 12.5%
24. What is ratio of male population in park A & D together to female population in park B & E together?
 (a) 6 : 7 (b) 1 : 1 (c) 7 : 6 (d) 5 : 6 (e) 5 : 7
25. If 30 females from each park are above 80 years age then find the average of no. of females who are below or equal to the age of 80 years from all the parks.
 (a) 295 (b) 285 (c) 300 (d) 280 (e) 290

Directions (26-30): Study the table given below carefully and answer the following questions.

Table shows the total (male + female) students in 3 different schools (A, B & C) and total (male + female) students in 10th class in these schools and total female students in 10th class in these schools.

School	Total (male + female) students	Total (male + female) students in 10 th	Total female students in 10 th
A	450	60	35
B	360	80	30
C	240	64	16

26. Total male students in 10th in schools – A & B together are what percent of total (male + female) students in school – C?
 (a) 44.25% (b) 31.25% (c) 48.25% (d) 36.25% (e) 39.25%
27. Find average student in 10th in schools – A, B & C.
 (a) 76 (b) 72 (c) 60 (d) 68 (e) 64
28. If ratio of total male to total female students in school – A & B is 5 : 4 and 5 : 7 respectively, then find ratio of total male students in school – A & B together to total female students in 10th in schools – A & B together.
 (a) 80 : 13 (b) 6 : 1 (c) 70 : 11 (d) 37 : 6 (e) None of the above.
29. Total male students in 10th in schools – B & C together are what percent more or less than total (male + female) students in 10th in school – A & B together?
 (a) 30%(b) 70%(c) 50%(d) 40%(e) 60%
30. Male students in 10th in schools – A, B & C together are how much more or less than female students in 10th in schools – A, B & C together?
 (a) 65 (b) 60 (c) 54 (d) 67 (e) 42

Direction (31 - 35): Read the following table and answer the questions.

Cities	Population	Percentage of male
A	53000	56
B	49000	55
C	65000	60
D	60000	45
E	75000	50

31. What is the ratio of total women from cities D, B and E to the total men from remaining cities?
 (a) 9255 : 6868 (b) 9155 : 6868 (c) 92 : 69 (d) 79 : 64 (e) None of these
32. What is the difference between the total population from top three popular cities to the total no. of Men in those cities?
 (a) 90000 (b) 95500 (c) 65500 (d) 95600 (e) 96500
33. No. of males in Cities D and E is approximately how many times of the no. of females from A and B?
 (a) 1.2 (b) 1.4 (c) 1.6 (d) 2 (e) 2.4
34. No of females in C is what percent more or less than no of females from E?
 (a) 30.66% less (b) 32% more (c) 30.66% more (d) 32% less (e) None of the above
35. What is the two-third of total women population?
 (a) 93580 (b) 94580 (c) 94580 (d) 95580 (e) 90000

Directions (36 - 40): The table suggests the no. of employees in the given states and percentage of officers in these states while remaining employees are clerks. Read the following questions and answer it carefully.

States	Employees	Percentage of officers
UP	153000	36
MP	149000	42
HP	165000	52
AP	160000	45
Delhi	175000	50

36. What is the ratio of total Clerks from cities AP, MP and Delhi to the total officers from remaining cities?
 (a) 3274 : 1761 (b) 5155 : 2868 (c) 92 : 69 (d) 79 : 64 (e) None of these
37. What is the difference between the total employees from top three cities according to the number of employees to the total no. of officers in those cities?
 (a) 290000 (b) 295500 (c) 254700 (d) 255600 (e) 226500
38. No. of officers in Cities AP and Delhi is approximately how many times of the no. of Clerks from UP and MP?
 (a) 0.825 (b) 0.865 (c) 1.665 (d) 0.585 (e) 0.405
39. No of clerks in HP is what percent more or less than no of clerks from Delhi?
 (a) 8.66% less (b) 12% more (c) 10.66% more (d) 12% less (e) None of the above
40. What is the two-third of total Clerks employees?
 (a) 293580 (b) 294580 (c) 294580 (d) 292694 (e) 290000

Directions (41-45): Read the following table and answer the following question

Total number of voters in different districts and Percentage of male out of these voters are given.

District	Total voters (Male and Female)	Percentage of male out of total voters
A	350	30%
B	400	54%
C	370	50%
D	250	46%
E	300	45%
F	625	32%

41. Total number of male voters from district A and B together are how much more/less than total number of female voters from district E and D together?
 (a) 21 (b) 32 (c) 25 (d) 31 (e) None of these
42. The average of total voters from district B, C and D together are approximately what percent less/more than the no. of male of voters from districts D, E and F together?
 (a) 33.33% (b) 24.44% (c) 66.66% (d) 16.66% (e) none of these
43. Find the ratio of the male voters from district D and E together to the female voters from district C, E and F together?
 (a) 10 : 31 (b) 10 : 41 (c) 10 : 51 (d) 10 : 61 (e) None of these
44. The no. of female voters from district F is what percent more/less than the no. of male voters from district A? (rounded off to nearest integer)
 (a) 290% (b) 230% (c) 300% (d) 305% (e) None of these
45. Find the ratio of no. of male voters from districts B and E together to the no. of female voters from districts C and A together?
 (a) 351:430 (b) 341:230 (c) 361:430 (d) 231:410 (e) None of these

Directions (46-50): Given below is the table which shows the cars of different brands, total number of cars in city 'X' and percentage of cars in good conditions.

Cars	Number of cars in city 'X'	Percentage of cars in good condition
Sedan	60000	80%
Maruti	84000	70%
Ford	48000	75%
Honda	63000	85%
Audi	32000	90%

NOTE- TOTAL CARS IN CITY 'X' = CARS IN GOOD CONDITION + CARS IN BAD CONDITION

46. Sedan cars in bad condition is what percent of sum of ford cars in good condition and Audi cars in bad condition?
 (a) $54\frac{25}{49}\%$ (b) $47\frac{6}{14}\%$ (c) $36\frac{27}{49}\%$ (d) $30\frac{30}{49}\%$ (e) $57\frac{2}{14}\%$
47. If total cars of Maruti company increases by $14\frac{2}{7}\%$ and percentage of cars in good condition remains same then find the number of cars in bad condition of Maruti company after the increment in total number of cars?
 (a) 24250 (b) 27500 (c) 23200 (d) 26700 (e) 28800
48. What is ratio of cars in good condition of Ford brand to the cars in bad condition of Honda brand?
 (a) 80 : 21 (b) 70 : 43 (c) 85 : 23 (d) 70 : 41 (e) 53 : 13
49. What is the average of cars in bad condition of brand Sedan, Ford and Audi together?
 (a) $7500\frac{1}{3}$ (b) $9400\frac{2}{3}$ (c) $5200\frac{1}{6}$ (d) $8320\frac{1}{3}$ (e) $9066\frac{2}{3}$
50. Cars of brand Maruti and Sedan in bad condition together are how much more than cars in bad condition of brand Honda and Ford together?
 (a) 12550 (b) 13650 (c) 16750 (d) 15750 (e) 14750

Directions (51-55): Table given below shows total population of five cities, percentage of employed population, ratio between unemployed male to unemployed female and ratio between employed male to employed female. Study the data carefully and answer the following question.

City	Population	Employed	Employed		Unemployed	
			Male	: Female	Male	: Female
A	1200	60%	1	: 3	1	: 2
B	800	40%	3	: 1	1	: 3
C	900	50%	3	: 2	2	: 3
D	1500	40%	1	: 1	4	: 5
E	1800	80%	1	: 5	1	: 1

NOTE: - Total population = Male + Female

51. Find total number of employed male in city 'C' and city 'E' together?
 (a) 330 (b) 390 (c) 450 (d) 510 (e) 570
52. Total number of unemployed females in city 'B' and city 'C' together is what percent more/less than total number of employed females in city 'A' and city 'D' together?
 (a) 50% (b) $33\frac{1}{3}\%$ (c) $66\frac{2}{3}\%$ (d) 75% (e) 25%
53. Find the ratio between total number of males in city 'E' to total number of males in city 'D'?
 (a) 3 : 5 (b) 5 : 3 (c) 9 : 20 (d) 20 : 9 (e) 2 : 5
54. Employed males in city 'B' is how much more than Unemployed males in the same city?
 (a) 120 (b) 150 (c) 180 (d) 210 (e) 240
55. Find the average number of Unemployed females in city 'B', 'C' and 'E' together?
 (a) 210 (b) 240 (c) 270 (d) 300 (e) 360

Directions (56-60): Given table shows the total no. of students in class X and XII of four schools A, B, C and D and % of student passed in these classes in 2017.

School	X		XII	
	Total Student	Pass %	Total Student	Pass %
A	500	80%	600	80%
B	600	70%	550	70%
C	450	50%	500	54%
D	800	60%	600	40%

56. No of student passed in class X of school C is what percent less than the no. of student passed in class XII of same school.
 (a) $16\frac{2}{3}\%$ (b) 20% (c) 6% (d) 30% (e) 15%
57. In 2018 no. of passed student of class XII of school B is increased by $\frac{1}{7}th$ and failed student remains same. Find the total strength of class XII of school B in 2018?
 (a) 505 (b) 605 (c) 600 (d) 595 (e) none of these
58. What is the ratio of Passed student of school D (X and XII) to that of school A (X and XII)
 (a) 11:9 (b) 12:11 (c) 9:11 (d) 10:13 (e) 11:18
59. What is the average of failed student of class X of school B, C and D.
 (a) 234.33 (b) 234.67 (c) 243.67 (d) 241.67 (e) 242.33
60. Passed student of class X of school B is how much more than that of class XII of same school.
 (a) 35 (b) 45 (c) 55 (d) 56 (e) 23

Directions (61-65): Study the table given below and answer the following Question

Company	Total employee	Employee in HR dept	% of Female in HR dept
A	300	80	75
B	250	50	80
C	400	100	60
D	200	60	60

61. Find the average no. of Females in HR department together ?
 (a) 54 (b) 46 (c) 49 (d) 50 (e) 52
62. Females in the HR dept of company C is what % more than male in HR department of company A ?
 (a) 250% (b) 200% (c) 100% (d) 300% (e) 150%
63. If total no. of employee in E is 25% more than D and no. of employee in HR dept is same as in company C, then employee other than HR dept in company E is what % of other dept employee in company B.
 (a) 60% (b) 80% (c) 75% (d) 50% (e) 55%
64. Find the difference between males of HR dept in company C and D together and females of HR dept in company B and C together?
 (a) 36 (b) 42 (c) 48 (d) 40 (e) 30
65. Find the average no. of employee other than HR dept. in A, B and C together?
 (a) 280 (b) 270 (c) 220 (d) 300 (e) 240

Directions (66-70): Study the table given below carefully and answer the following questions.

Table shows the percentage of expats and number of local employees in 2010 and in 2018 of three different countries (A, B & C).

Countries	2010		2018	
	% of expats	Local employees	% of expats	Local employees
A	16%	588	12%	704
B	28%	648	15%	425
C	10%	540	18%	656

Note – Total employees in a country in a particular year = Total (expat + local) employees in that country in that year.

66. What is the ratio of total expat employees in A & B together in 2010 to total expat employees in A & C together in 2018?
 (a) 7 : 5 (b) 3 : 2 (c) 91 : 60 (d) 23 : 15 (e) None of the above.
67. Total employees in B & C together in 2010 are how much more than total employees in A in 2018?
 (a) 600 (b) 900 (c) 800 (d) 700 (e) 500
68. Local employees in A & C together in 2018 are what percent more than total employees in B in 2010?
 (a) $51\frac{1}{9}\%$ (b) $46\frac{4}{9}\%$ (c) $55\frac{5}{9}\%$ (d) $42\frac{1}{9}\%$ (e) $58\frac{4}{9}\%$
69. Average number of expat employees in A, B & C in 2018 is what percent of total employees in C in 2010?
 (a) 10% (b) 17.5% (c) 12.5% (d) 15% (e) 20%
70. Expat employees in B in 2010 & 2018 together are how much more or less than expat employees in C in 2010 & 2018 together?
 (a) 123 (b) 134 (c) 112 (d) 118 (e) 129

Directions (71-75): Table given below shows the number students in four different schools (A, B, C & D) in 1999 & 2000 and percentage of girls out of total students. Study the line chart and table given below and answer the following questions.

Schools	1999		2000	
	Total students	Percentage of girls	Total Students	Percentage of girls
A	1200	70%	1600	90%
B	1500	60%	1200	90%
C	600	95%	1000	90%
D	900	90%	1200	60%

71. Total boys in A & D together in 1999 are what percent of total girls in B & D together in 2000?
 (a) 75% (b) 40% (c) 25% (d) 55% (e) 60%
72. Find total boys in D in 2000 are what percent of total boys in A in the same year?
 (a) 300% (b) 250% (c) 150% (d) 180% (e) 200%
73. Find ratio of total students in A & C together in 1999 to total girls in C & D together in 2000.
 (a) 7 : 5 (b) 11 : 5 (c) 12 : 7 (d) 10 : 9 (e) 5 : 3
74. If total students in A in 2001 are 50% more than total girls in B in 1999 and ratio of girls to boys in A in 2001 is 2 : 1, then find average number of girls in A in 1999, 2000 & 2001.
 (a) 1150 (b) 1060 (c) 1200 (d) 1170 (e) 1030
75. Find average number of girls in A, B, C & D in 1999 is how much more or less than total boys in A, B, C & D together in 2000?
 (a) 80 (b) 160 (c) 350 (d) 190 (e) 270

Direction (76 – 80): Table Given below shows total number of male visitors on four different days to a park and it also shows percentage of female visitors on these four days. Read the data carefully and answer the questions.

Days	Total male visitors	percentage of female visitors
Sunday	120	76%
Monday	280	30%
Tuesday	500	37.5%
Wednesday	420	40%

76. Total female visitors on Sunday & Monday together is how much more or less than total number of female visitors on Tuesday & Wednesday together.
 (a) 160 (b) 140 (c) 120 (d) 100 (e) 80
77. Total visitors on Wednesday are what percent more than total number of visitors on Sunday?
 (a) 60% (b) 20% (c) 40% (d) 80% (e) 50%

78. Total number of male visitors on Friday are 25% more than total number of male visitors on Monday, while total number of female visitors on Friday are 40% more than total number of visitors on Tuesday. Find total visitors on Friday?
 (a) 1470 (b) 1050 (c) 1620 (d) 1200 (e) 1170
79. Total number of visitors on Wednesday is how much more than total number of female visitors on Sunday and Monday together?
 (a) 300 (b) 200 (c) 250 (d) 350 (e) 150
80. If there is one guide for per five visitors on each day, then find total **number** of guides required for all visitors on these four days?
 (a) 240 (b) 480 (c) 220 (d) 440 (e) 460

Previous Years' Solutions of Prelims

1. **(d):** Required difference = $(80 + 100) - (70 + 90) = 20$
2. **(a):** Total orders (all three items) received by R = $(80 + 100 + 30) = 210$
 Total orders (all three items) received by Q = $(40 + 70 + 90) = 200$
 Required percentage = $\frac{210-200}{200} \times 100 = 5\%$
3. **(e):** Total orders of item A & B received by P = $80 + 60 = 140$
 Total orders of item B & C received by Q = $70 + 90 = 160$
 Required ratio = $140 : 160 = 7 : 8$
4. **(b):** Average number of orders of item B received by Q & R = $\frac{70+100}{2} = 85$
 Required percentage = $\frac{85}{80} \times 100 = 106\frac{1}{4}\%$
5. **(c):** Required sum = $80 + 60 + 50 = 190$
6. **(c):** required percentage
 $= \frac{90}{90+113+112+85} \times 100 = 22.5\%$
7. **(a):** required ratio = $(121 + 124) : 140 = 245 : 140 = 7 : 4$
8. **(e):** required difference
 $= \frac{102+85+140+117}{4} - \frac{90+113+112+85}{4}$
 $= \frac{444}{4} - \frac{400}{4} = 111 - 100 = 11$
9. **(d):** required difference = $124+113-117-92=28$
10. **(d):** required percentage = $\frac{85-51}{85} \times 100 = \frac{34}{85} \times 100 = 40\% \text{ less}$
11. **(b):** Required ratio
 $= \frac{28+60}{38+29} = \frac{88}{67}$
12. **(e):** Required average
 $= \frac{35+48+55}{3} = \frac{138}{3} = 46$
13. **(c):** Required percentage
 $= \frac{(44+30)}{(35+65)} \times 100 = \frac{74}{100} \times 100 = 74\%$
14. **(a):** Total cakes sold on Monday = $38 + 60 + 40 + 24 + 29 = 191$
 Total cakes sold on Tuesday = $46 + 54 + 55 + 44 + 30 = 229$
 Difference = $229 - 191 = 38$
15. **(d):** No. of cakes of type F = $\frac{125}{100} \times (50 + 42 + 24 + 44) = \frac{5}{4} \times 160 = 200$
16. **(d):** Required average = $\frac{450+420+450}{3} = 440$
17. **(a):** Total male participated from school - B & D together = $540 + 560 = 1100$
 Total female participated from school - A & C together = $450 + 500 = 950$
 Required difference = $1100 - 950 = 150$
18. **(d):** Total male participated from school - B & C together = $540 + 720 = 1260$
 Total female participated from school - A & D together = $450 + 450 = 900$
 Required % = $\frac{1260-900}{900} \times 100 = 40\%$
19. **(b):** Total students participated from school F
 $= \frac{140}{100} \times 650 + 420 \times \frac{32}{21}$
 $= 910 + 640 = 1550$
20. **(b):** Total number of male students participated from all the five schools = $(650 + 540 + 720 + 560 + 680) = 3150$
21. **(b):** male population who did not visit park A = $\frac{20}{100} \times \frac{60}{100} \times 400 = 48$
 Male population who visited in park A = $400 - (150 + 48) = 202$
 Required % = $\frac{202}{500} \times 100 = 40.4\%$

- 22. (d):** male population in park B, C & D = $(500 - 200) + (700 - 350) + (800 - 450) = 1000$
Required average = $\frac{1000}{3} = 333.33$
- 23. (e):** Male population in park E = $900 - 500 = 400$
Required % = $\frac{450-400}{400} \times 100 = 12.5\%$
- 24. (a):** male population in park A & D = $400 - 150 + 800 - 450 = 600$
Required ratio = $600 : (200 + 500) = 6 : 7$
- 25. (c):** total female population = $150 + 200 + 350 + 450 + 500 = 1650$
Female population above 80 years age = $30 \times 5 = 150$
Required average = $\frac{1650-150}{5} = 300$
- 26. (b):** Total male students in 10th in schools - A & B together = $(60 - 35) + (80 - 30) = 25 + 50 = 75$
Required % = $\frac{75}{240} \times 100 = 31.25\%$
- 27. (d):** Required average = $\frac{60+80+64}{3} = \frac{204}{3} = 68$
- 28. (a):** Total male students in school - A & B together = $\left(\frac{5}{9} \times 450\right) + \left(\frac{5}{12} \times 360\right) = 250 + 150 = 400$
Total female students in 10th in schools - A & B together = $35 + 30 = 65$
Required ratio = $\frac{400}{65} = 80 : 13$
- 29. (a):** Total male students in 10th in schools - B & C together = $(80 - 30) + (64 - 16) = 50 + 48 = 98$
Total (male + female) students in 10th in school - A & B together = $60 + 80 = 140$
Required % = $\frac{140-98}{140} \times 100 = 30\%$
- 30. (e):** Male students in 10th in schools - A, B & C together = $(60 - 35) + (80 - 30) + (64 - 16) = 25 + 50 + 48 = 123$
Female students in 10th in schools - A, B & C together = $(35 + 30 + 16) = 81$
Required difference = $123 - 81 = 42$

- 31. (a):** Desired ratio = $\frac{60 \times 55 + 490 \times 45 + 750 \times 50}{530 \times 56 + 650 \times 60} = \frac{33000 + 22050 + 37500}{29680 + 39000} = \frac{92550}{68680} = \frac{9255}{6868}$
- 32. (e):** Top three population cities = E, C, D respectively
Total population in C, D and E = 200000
Total men in those cities = $39000 + 27000 + 37500 = 103500$
Difference = $200000 - 103500 = 96500$
- 33. (b):** Desired value = $\frac{27000+37500}{530 \times 44 + 490 \times 45} = \frac{64500}{45370} \approx 1.4$ times
- 34. (a):** Female in C = $650 \times 40 = 26,000$
Female from E = 37,500
Difference = 11,500
Desired % = $\frac{11500}{37500} \times 100 = 30.66\%$ less
- 35. (c):** Two-third of total women population = $\frac{2}{3}(45370 + 26000 + 33000 + 37500) = \frac{2}{3}(141870) = 94580$
- 36. (a):** Total clerks from (AP + MP + Delhi) = $[(160 \times 55) + (149 \times 58) + 175 \times 50] \times 10 = [8800 + 8642 + 8750] \times 10 = 261920$
Total officers from rest of the cities (i.e. UP + HP) = $[153 \times 36 + 165 \times 52] \times 10 = [5508 + 8580] \times 10 = 140880$
Desired Ratio = $\frac{261920}{140880} = \frac{3274}{1761}$
- 37. (c):** Top three cities acc. to no. of employees = Delhi + HP + AP = $175000 + 165000 + 160000 = 500000$
Total officers from these cities = $87500 + 1650 \times 52 + 1600 \times 45 = 87500 + 85800 + 72000 = 245300$
Desired difference = $500000 - 245300 = 254700$
- 38. (b):** Desired value = $\frac{72000+87500}{1530 \times 64 + 86420} = \frac{159500}{184340} = 0.865$ times
- 39. (e):** Desired value = $\frac{[1650 \times 48 - 87500]}{87500} \times 100 = \frac{[-8300]}{87500} \times 100 = 9.5\%$ less
- 40. (d):** $\frac{2}{3}(\text{Total clerks}) = \frac{2}{3}(261920 + 97920 + 79200) \approx 292694$
- 41. (a):** No. of male voters from district A and B = $\frac{30}{100} \times 350 + \frac{54}{100} \times 400 = 105 + 216 = 321$
Total no. of female voters from E and D = $250 \times \frac{54}{100} + 300 \times \frac{55}{100} = 135 + 165 = 300$
Difference = $321 - 300 = 21$

42. (b): Average no. of voters from district, B, C and D

$$= \frac{400+370+250}{3}$$

Male voters from D, E, and F together

$$= 250 \times \frac{46}{100} + 300 \times \frac{45}{100} + 625 \times \frac{32}{100}$$

$$= 115 + 135 + 200$$

$$= 450$$

$$\text{Req. \%} = \frac{450-340}{450} \times 100 = 24.44\%$$

43. (a): No. of male voters from district D and E =

$$250 \times \frac{46}{100} + 300 \times \frac{45}{100}$$

$$= 115 + 135 = 250$$

No. of female voters from C, E and F = $370 \times \frac{50}{100} +$

$$300 \times \frac{55}{100} + 625 \times \frac{68}{100}$$

$$= 185 + 165 + 425$$

$$= 775$$

$$\text{Ratio} = \frac{250}{775} = \frac{10}{31}$$

44. (d): No. of female voters from F = $625 \times \frac{68}{100} = 425$

$$\text{No. of male voters from A} = \frac{350}{1} \times \frac{30}{100}$$

$$= 105$$

$$\text{Req. \%} = \frac{425-105}{105} \times 100$$

$$= 304.7\%$$

$$\approx 305\%$$

45. (a): No. of male voters from B = $400 \times \frac{54}{100} = 216$

$$\text{No. of male voters from E} = 300 \times \frac{45}{100} = 135$$

$$\text{No. of female voters from C} = 370 \times \frac{50}{100} = 185$$

$$\text{No. of female voters from A} = 350 \times \frac{70}{100} = 245$$

$$\text{Required ratio} = \frac{351}{430}$$

46. (d): Sedan cars in bad condition

$$= \frac{20}{100} \times 60000 = 12000$$

Ford cars in good condition

$$= \frac{75}{100} \times 48000 = 36000$$

Audi cars in bad condition

$$= \frac{10}{100} \times 32000 = 3200$$

$$\text{Required percentage} = \frac{12000}{36000+3200} \times 100$$

$$= \frac{1500}{49} \% = 30 \frac{30}{49} \%$$

47. (e): Total cars of Maruti company after increment

$$= \frac{8}{7} \times 84000 = 96000$$

Now cars in bad condition

$$= \frac{30}{100} \times 96000 = 28800$$

48. (a): Required ratio = $\frac{75\% \text{ of } 48000}{15\% \text{ of } 63000} = 80 : 21$

49. (e): Cars in bad condition of brand Sedan

$$= 20\% \text{ of } 6000 = 12000$$

Cars in bad condition of brand Ford

$$= 25\% \text{ of } 48000$$

$$= 12000$$

Cars in bad condition of brand Audi

$$= 10\% \text{ of } 32000$$

$$= 3200$$

$$\text{Required average} = \frac{12000+12000+3200}{3}$$

$$= \frac{27200}{3} = 9066 \frac{2}{3}$$

50. (d): Cars of brand Maruti and Sedan in bad condition

$$= 30\% \text{ of } 84000 + 20\% \text{ of } 60000$$

$$= 25200 + 12000$$

$$= 37200$$

Cars of brand Honda and Ford in bad condition

$$= 15\% \text{ of } 63000 + 25\% \text{ of } 48000$$

$$= 9450 + 12000$$

$$= 21450$$

$$\text{Required difference} = 37200 - 21450 = 15750$$

51. (d): Employed male in city 'C' and 'E' together =

$$900 \times \frac{50}{100} \times \frac{3}{5} + 1800 \times \frac{80}{100} \times \frac{1}{6}$$

$$= 270 + 240$$

$$= 510$$

52. (e): Total number of unemployed females in city 'B' and city 'C' together

$$= 800 \times \frac{60}{100} \times \frac{3}{4} + 900 \times \frac{50}{100} \times \frac{3}{5} = 360 + 270 =$$

$$630$$

Total number of employed females in city 'A' and city 'D' together

$$= 1200 \times \frac{60}{100} \times \frac{3}{4} + 1500 \times \frac{40}{100} \times \frac{1}{2} = 540 + 300 =$$

$$840$$

$$\text{Required \%} = \frac{840-630}{840} \times 100 = \frac{210}{840} \times 100 = 25\%$$

53. (a): Total number of males in city 'E' = $1800 \times \frac{80}{100} \times$

$$\frac{1}{6} + 1800 \times \frac{20}{100} \times \frac{1}{2} = 240 + 180 = 420$$

Total number of males in city 'D' = $1500 \times \frac{40}{100} \times$

$$\frac{1}{2} + 1500 \times \frac{60}{100} \times \frac{4}{9} = 300 + 400 = 700$$

$$\text{Required Ratio} = \frac{420}{700} = \frac{3}{5}$$

54. (a): Employed males in city 'B' = $800 \times \frac{40}{100} \times \frac{3}{4} = 240$

$$\text{Unemployed males in city 'B'} = 800 \times \frac{60}{100} \times \frac{1}{4} =$$

$$120$$

$$\text{Required difference} = 240 - 120 = 120$$

55. (c): Unemployed females in city 'B', 'C' and 'E' together

$$= 800 \times \frac{60}{100} \times \frac{3}{4} + 900 \times \frac{50}{100} \times \frac{3}{5} + 1800 \times \frac{20}{100} \times \frac{1}{2}$$

$$= 360 + 270 + 180 = 810$$

$$\text{Required average} = \frac{810}{3} = 270$$

56. (a): School – C

No. of student passed in class X

$$\Rightarrow \frac{450 \times 50}{100} = 225$$

No. of student passed in class XII

$$= \frac{500 \times 54}{100} = 270$$

$$\text{Required percent} = \frac{270-225}{270} \times 100 = 16\frac{2}{3}\%$$

57. (b): In school B

Passed student in XII in 2018

$$= \frac{550 \times 70}{100} \times \frac{8}{7} = 440$$

$$\text{Failed student in 2018} = \frac{550 \times 30}{100} = 165$$

$$\text{Total student in XII in 2018} = 440 + 165 = 605$$

$$\text{58. (c): Required ratio} = \frac{\frac{800 \times 60}{100} + \frac{600 \times 40}{100}}{\frac{500 \times 80}{100} + \frac{600 \times 80}{100}}$$

$$= \frac{480+240}{400+480} = \frac{9}{11}$$

$$\text{59. (d): Required average} = \frac{\frac{600 \times 30}{100} + \frac{450 \times 50}{100} + \frac{800 \times 40}{100}}{3}$$

$$= \frac{180+225+320}{3}$$

$$= \frac{725}{3} = 241.67$$

60. (a): Passed student of class X of school B

$$= \frac{600 \times 70}{100} = 420$$

Passed student of class XII of school B

$$= \frac{550 \times 70}{100} = 385$$

$$\text{Required difference} \Rightarrow 420 - 385 = 35$$

61. (c): Average no. of females in HR dept

$$= 80 \times \frac{75}{100} + 50 \times \frac{80}{100} + 100 \times \frac{60}{100} + 60 \times \frac{60}{100}$$

$$= \frac{60+40+60+36}{4} = \frac{196}{4} = 49$$

$$\text{62. (b): Females in company C (HR)} = 100 \times \frac{60}{100} = 60$$

$$\text{Males in company A (HR)} = 80 \times \frac{25}{100} = 20$$

$$\text{Difference} = 60 - 20 = 40$$

$$\therefore \% = \frac{40}{20} \times 100 = 200\% \text{ more}$$

$$\text{63. (c): Total employee in E} = 200 \times \frac{125}{100} = 250$$

$$\therefore \text{employee of HR dept in E} = 100$$

$$\therefore \text{other employee} = 150$$

$$\therefore \% \text{ of other employee} = 150 \times \frac{100}{200} = 75\%$$

64. (a): Males in HR dept in C and D

$$= 100 \times \frac{40}{100} + 60 \times \frac{40}{100} = 40 + 24 = 64$$

$$\text{Females in HR dept of B and C} = 50 \times \frac{80}{100} +$$

$$100 \times \frac{60}{100} = 100$$

$$\therefore \text{Difference} = 100 - 64 = 36$$

65. (e): Average of A, B, C

$$= \frac{220+200+300}{3} = \frac{720}{3} = 240$$

66. (c): Total expat employees in A & B together in 2010 =

$$\left(588 \times \frac{16}{84}\right) + \left(648 \times \frac{28}{72}\right)$$

$$= 112 + 252 = 364$$

Total expat employees in A & C together in 2018 =

$$\left(704 \times \frac{12}{88}\right) + \left(656 \times \frac{18}{82}\right)$$

$$= 96 + 144 = 240$$

$$\text{Required ratio} = \frac{364}{240} = 91 : 60$$

67. (d): Total employees in B & C together in 2010 =

$$\left(648 \times \frac{100}{72}\right) + \left(540 \times \frac{100}{90}\right)$$

$$= 900 + 600 = 1500$$

$$\text{Total employees in A in 2018} = \left(704 \times \frac{100}{88}\right)$$

$$= 800$$

$$\text{Required difference} = 1500 - 800$$

$$= 700$$

68. (a): Local employees in A & C together in 2018 = 704 +

$$656$$

$$= 1360$$

$$\text{Total employees in B in 2010} = \left(648 \times \frac{100}{72}\right)$$

$$= 900$$

$$\text{Required \%} = \frac{1360-900}{900} \times 100$$

$$= 51\frac{1}{9}\%$$

69. (b): Average number of expat employees in A, B & C in

$$2018$$

$$= \frac{1}{3} \times \left(\left(704 \times \frac{12}{88}\right) + \left(425 \times \frac{15}{85}\right) + \left(656 \times \frac{18}{82}\right) \right)$$

$$= \frac{1}{3} \times (96 + 75 + 144)$$

$$= 105$$

$$\text{Total employees in C in 2010} = \left(540 \times \frac{100}{90}\right)$$

$$= 600$$

$$\text{Required \%} = \frac{105}{600} \times 100$$

$$= 17.5\%$$

70. (a): Expat employees in B in 2010 & 2018 together =

$$\left(648 \times \frac{28}{72}\right) + \left(425 \times \frac{15}{85}\right)$$

$$= 252 + 75 = 327$$

Expat employees in C in 2010 & 2018 together =

$$\left(540 \times \frac{10}{90}\right) + \left(656 \times \frac{18}{82}\right)$$

$$= 60 + 144 = 204$$

$$\text{Required difference} = 327 - 204$$

$$= 123$$

71. (c): Total boys in A & D together in 1999 = 1200
 $\times \frac{30}{100} + 900 \times \frac{10}{100}$
 $= 360 + 90 = 450$
 Total girls in B & D together in 2000 = 1200
 $\times \frac{90}{100} + 1200 \times \frac{60}{100}$
 $= 1080 + 720$
 $= 1800$

Required percentage = $\frac{450}{1800} \times 100 = 25\%$

72. (a): Total boys in D in 2000 = $1200 \times \frac{40}{100} = 480$
 Total boys in A in 2000 = $1600 \times \frac{10}{100} = 160$
 Required percentage = $\frac{480}{160} \times 100 = 300\%$

73. (d): Required ratio = $\frac{(1200+600)}{(1000 \times \frac{90}{100} + 1200 \times \frac{60}{100})}$
 $= 1800 : 1620 = 10 : 9$

74. (b): Total students in A in 2001 = $\frac{150}{100} \times 1500 \times \frac{60}{100}$
 $= 1350$
 Total girls in A in 2001 = $1350 \times \frac{2}{3} = 900$
 Total girls in A in 1999 = $1200 \times \frac{70}{100} = 840$
 Total girls in A in 2000 = $1600 \times \frac{90}{100} = 1440$
 Required average = $\frac{840+1440+900}{3} = 1060$

75. (a): Average number of girls in A, B, C & D in 1999
 $= \frac{1200 \times \frac{70}{100} + 1500 \times \frac{60}{100} + 600 \times \frac{95}{100} + 900 \times \frac{90}{100}}{4}$
 $= 780$

Total boys in A, B, C & D together in 2000 =
 $1600 \times \frac{10}{100} + 1200 \times \frac{10}{100} + 1000 \times \frac{10}{100} +$
 $1200 \times \frac{40}{100} = 860$
 Required difference = $860 - 780 = 80$

76. (e): Total female visitors on Sunday = $120 \times \frac{76}{24} = 380$
 Total female visitors on Monday = $280 \times \frac{30}{70} = 120$
 Total female visitors on Tuesday
 $= 500 \times \frac{37.5}{62.5} = 500 \times \frac{3}{5} = 300$
 Total female visitors on Wednesday
 $= 420 \times \frac{40}{60} = 280$
 Required difference = $300 + 280 - 380 - 120 =$
 $580 - 500 = 80$

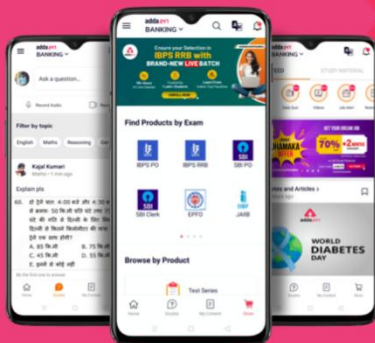
77. (c): Total visitors on Wednesday = $420 \times \frac{100}{60} = 700$
 Total number of visitors on Sunday = $120 \times \frac{100}{24} =$
 500
 Required percentage = $\frac{70-50}{50} \times 100 = 40\%$

78. (a): Total number of male visitors on Friday =
 $\frac{125}{100} \times 280 = 350$
 Total number of female visitors on Friday =
 $\frac{140}{100} \times 500 \times \frac{100}{62.5} = 1120$
 Total visitors on Friday = $1120 + 350 = 1470$

79. (b): Total number of visitors on Wednesday = $420 \times$
 $\frac{100}{60} = 700$
 Total number of female visitors on Sunday and
 Monday = $120 \times \frac{76}{24} + 280 \times \frac{30}{70}$
 $= 380 + 120 = 500$
 Required difference = $700 - 500 = 200$

80. (b): Total number of visitors on all four days =
 $120 \times \frac{100}{24} + 280 \times \frac{100}{70} + 500 \times \frac{100}{62.5} + 420 \times \frac{100}{60}$
 $= 500 + 400 + 800 + 700 = 2400$
 Total number of guides required = $\frac{2400}{5} = 480$

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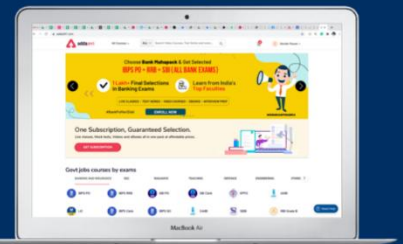


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Previous Years' Questions of Mains

Direction (1-6): Answer the following question based on the given information.

A, B, C, D, and E are five building in which the distribution of male and female in the month of January is given. In 1st column sum of male and female is given and in 2nd column ratio of male and female is given.

Note: neither any person left nor any person came to live in January.

Building	Sum of number of male and female	Male : Female
A	80	5:3
B	110	15:7
C	120	11:13
D	100	3:2
E	105	11:10

- Find the average number of females in building B, C and E?
(a) 60 (b) 70 (c) 50 (d) 40 (e) 20
- In February 20% male of building C left the building and no person came to live in building C. If the ratio of male and female in February in building C is 4:5, then find the number of females who left the building C in February?
(a) 5 (b) 8 (c) 12 (d) 10 (e) 15
- There is another building F in which number of people live are 20% more than the number of people live in building A. In building F there are 10 flats in which 2 people live in each flat, 10 flats in which 3 people live in each flat, 5 flats in which 4 people live in each flat and in remaining flat there is 1 person live in each flat. Find total number of flat in building F?
(a) 51 (b) 67 (c) 82 (d) 98 (e) 47
- Number of females in building D is what % more/less than number of females in building E?
(a) 15% (b) 20% (c) 25% (d) 10% (e) 7.5%
- Ratio of number of people in building E and building G is 21:24 and number of male in building G is $\frac{2}{3}$ rd of number of females in building G. Find the number of males in building G?
(a) 63 (b) 18 (c) 27 (d) 48 (e) 54
- Number of males in February in building A is equal to the average number of male in January in building B and building C and number of female in Feb in building A is 5 more than the number of male in Feb in that building. Find the number of people in Feb in building A?
(a) 140 (b) 95 (c) 135 (d) 120 (e) 100

Directions (7-11): Table given below shows number of tickets sold in six different theatres, number of tickets sold to children and remaining ticket sold to adults [male and female]. Study the data carefully and answer the following questions.

Theatre	Ticket sold to children	Ticket sold to Adults (Male : Female)
C1	15	6 : 7
C2	10	3 : 4
C3	20	2 : 3
C4	14	6 : 5
C5	8	5 : 4
C6	12	9 : 8

Total 80 tickets are sold in each theatre.

- Find the ratio of number of tickets sold to males by C3 and C6 theatre together to number of tickets sold to females by C3 and C5 theatre together.
(a) 14 : 19 (b) 15 : 17 (c) 20 : 23 (d) 16 : 19 (e) 14 : 17
- Number of female who bought ticket from C2 and C4 theater together is what percent more than number of males who bought ticket from C5 theatre.
(a) $33\frac{1}{3}\%$ (b) 50% (c) $66\frac{2}{3}\%$ (d) 75% (e) 87.5%

9. If per ticket price for children, male and female is Rs. 150, Rs. 200 and Rs. 250 respectively. Then find the total revenue earn by C4 theater.
 (a) 16600 (b) 15400 (c) 16800 (d) 15800 (e) 16400
10. Find the average number of male who bought tickets from C1, C2 and C3 theatre together.
 (a) 30 (b) 28 (c) 32 (d) 34 (e) 36
11. Number of males who bought ticket from C4, C5 and C6 together is how much more than number of females who bought ticket from same theatres.
 (a) 18 (b) 20 (c) 21 (d) 24 (e) 26

Direction (12-17)- Study the table given below carefully and answer the questions.

Table given below shows total number of students in four different class and number of students who do not participate. And table also shows percentage of students who participate in dancing.

Class	Total students	No. of students who do not participate	% of students who participate in Dance
III	180	60	60
IV	150	50	45
V	200	55	80
VI	250	130	70

Note- Student participate only in either dancing or singing.

12. No. of student who participate in singing from class III is how much more or less than no. of student who participate in dancing from class V?
 (a) 68 (b) 62 (c) 72 (d) 84 (e) 58
13. What is the total no. of student who participate in either dancing or singing from all class together?
 (a) 442 (b) 524 (c) None of these (d) 485 (e) 584
14. No. of student who participate in singing from class VI is what percent of total no. of student from class V?
 (a) 12% (b) 18% (c) 24% (d) 32% (e) None of these
15. What is the ratio of no. of student who participate from class IV to the no. of student who do not participate from class V?
 (a) 20 : 13 (b) 10 : 7 (c) None of these (d) 5 : 2 (e) 20 : 11
16. What is the average no. of student who participate in either dancing from class III, IV and VI?
 (a) 63 (b) 71 (c) 67 (d) 76 (e) 82
17. If ratio of boys to girls who participate in singing from class III is 1 : 2. Then find the boys who participate in singing from class III is what percent of student who participate in dancing from class VI?
 (a) $19\frac{2}{21}\%$ (b) $17\frac{1}{21}\%$ (c) $21\frac{1}{21}\%$ (d) $23\frac{1}{21}\%$ (e) $19\frac{1}{21}\%$

Direction (18-22): - Table given below shows percentage of men out of total men who worked on odd days in three different months and rest of the men are working on even days of the respective month. Study the table carefully and answer the following questions.

Months	Total Number of Men worked	Percentage of men worked on odd number days
March	1000	30%
April	1500	20%
August	750	60%

Note: Each man works for 8 hours per day

Total man-hours = Total man worked \times Total day of work \times 8 hours

18. Total man-hours on odd days of march is what % of the total man-hours on even days of April?
 (a) $26\frac{2}{3}\%$ (b) $18\frac{2}{3}\%$ (c) $33\frac{1}{3}\%$ (d) $16\frac{2}{3}\%$ (e) $58\frac{1}{3}\%$

19. Total man hour of April is how much more or less than the total man hour of August?
 (a) 80,000 (b) 83,200 (c) 84,800 (d) 86,400 (e) 88,000
20. Find the ratio between man-hour on even days of march to man hour on even days of August?
 (a) 6 : 1 (b) 7 : 3 (c) 8 : 3 (d) 3 : 7 (e) 9 : 2
21. Man-hour on odd days of April is how much % less than the man hour on odd days of August?
 (a) $33\frac{1}{3}\%$ (b) 40% (c) 37.5% (d) 62.5% (e) 60%
22. What is the average of man hours on even days of all three months together.
 (a) 88,000 (b) 66,000 (c) 86,000 (d) 78,000 (e) 74,000

Directions (23-28): Study the following table carefully to answer the questions that follow.

The table shows the online and offline contestants taking part in a survey from four villages and total contestant who have not completed the survey (online and offline)

Note-1-Total contestants in a village= Online contestants + Offline contestants

2-Total contestants in a village=Contestants who complete the survey + contestants who do not complete survey

Village	Online contestants	Offline contestants	Contestants who do not complete the survey (online + offline)
A	350	44%	122
B	560	65%	92
C	465	40%	108
D	480	60%	190

23. In village A, if the number of online and offline contestants who didn't complete the survey are equal, then online contestants from village A who completed the survey are what percent (approximate) more than offline contestants who completed the survey from the same village?
 (a) 27% (b) 22% (c) 35% (d) 31% (e) 37%
24. Total number of contestants from village C who completed the survey are how much more or less than total number of contestants who completed the survey from village B?
 (a) 841 (b) 857 (c) 837 (d) 851 (e) 860
25. If ratio of online & offline contestants who didn't completed the survey in village 'D' is 8 : 11 and 65% of online contestants who completed the survey are male and 60% of offline contestants who complete the survey are female, then find the difference between females of online contestants who completed the survey and males of offline contestants who completed the survey ?
 (a) 102 (b) 88 (c) 104 (d) 108 (e) None of these
26. Find the difference between the number of offline contestants of village C and that of village A.
 (a) 45 (b) 40 (c) 38 (d) 35 (e) None of these
27. Find sum the of difference between total number of online and offline contestants who participated in the survey from all four village.
 (a) 950 (b) 980 (c) 960 (d) 735 (e) 840
28. The number of offline and online contestant together who completed the survey from village C are approximately what percent of total participants on survey from village D?
 (a) 52% (b) 62% (c) 48% (d) 56% (e) 58%

Direction (29-33): Due to demonetization of 500 Rs. and 1000 Rs. note, following rules are applicable to the people in the country —

	Max Credit Limit per day in a Bank	Max Withdrawal limit per day from Bank	% Penalty on Tax collected by govt.
Senior Citizen	2,50,000 Rs.	40,000 Rs.	30%
Male	5,00,000 Rs.	65,000 Rs.	55%
Female	5,00,000 Rs.	50,000 Rs.	45%
Children	10,00,00 Rs.	10,000 Rs.	20%

Note- 1. Following age group will be applicable-

1. 0 – 8 years old → children
2. 9 – 45 Male / Female
3. < 45 senior citizens

Note- 2. Following tax slabs will be applicable-

1. No tax → 0 – 250000 Rs.
2. 10% → 250000 - 500000 Rs.
3. 20% → 500000 - 1000000 Rs.
4. 30% → <1000000 Rs.

29. Babu, 56 years old has 5 crore black money. How much money (in crores) will he get after giving tax to the govt. and penalty on it ?

- (a) 2.95 (b) 3.05 (c) 3.95 (d) 4.05 (e) 0.95

30. Ram, 35 years old has black money amounts to 3,25,000Rs. On which day he will get all of his money after giving tax and penalty if he visits bank on daily basis and withdraw maximum amount.

- (a) 4th (b) 5th (c) 3rd (d) 6th (e) 7th

31. If the credit limit per day in Bank for senior citizen is increased by 20% and the withdrawal limit per day from bank for senior citizen is increased by 50% then find the ratio of credit limit per day to the withdrawal limit per day after increment for senior citizen?

- (a) 2 : 1 (b) 3 : 1 (c) 4 : 1 (d) 7 : 1 (e) 5 : 1

32. Govt. said that there will be investment of 25% out of the total amount recovered as tax and penalty on tax in Garib Kalyan Yojana scheme. If Gopal, 26 year old has 20 crore black money then find how much money will be invested in Garib Kalyan Yojana scheme?

- (a) 2,32,50,000 (b) 34,32,50,000 (c) 1,19,40,000 (d) 4,05,10,000 (e) None of these

33. Find the difference between the days required to withdraw 52,00,000Rs. money under a male bank account to the days required to withdraw 5,00,000Rs. money under a children Bank account?

- (a) 25 days (b) 20 days (c) 40 days (d) 30 days (e) None of these

Directions (34-38): Table given below shows online and offline contestant taking part in a survey from five villages and total contestants who have not completed the survey (both online as well as offline). Study the data carefully and answer the following questions based on it.

Note:

(1) Total contestants = Online contestants + Offline contestants

(2) Total contestants = constants who completed survey + Contestants who have not completed the survey

Village	Online Contestant (in figure)	Offline contestant (in %)	Contestants who have not completed the survey (online + offline)
M	576	52	96
N	630	58	120
O	1188	28	306
P	486	64	45
Q	792	45	153

34. Offline contestants who have not completed the survey in village Q is 12.5% more than online contestants who have not completed the survey of same village. Find number of contestants who completed offline survey is what percent of the number of contestants who completed online survey in village Q?

- (a) 75.25% (b) 78.75% (c) 79.5% (d) 81.25% (e) 72.75%

35. In village N, out of contestants who have not completed the survey 35% are online contestants while remaining are offline contestants. Find number of offline contestants who completed the survey is how much more than number of online contestants who completed the survey?

- (a) 78 (b) 164 (c) 178 (d) 240 (e) 204

36. In village O, ratio of contestants who have not completed online survey to offline survey is 10 : 7. Find the ratio of contestants who have completed offline survey to contestants who have completed online survey.
 (a) 3 : 1 (b) 1 : 3 (c) 2 : 1 (d) 1 : 2 (e) 4 : 9
37. Find the difference between number of contestants who have completed survey in village Q to number of contestants who have completed survey in village P?
 (a) 18 (b) 15 (c) 12 (d) 9 (e) 21
38. Total contestants of village M is what percent of the total contestant of village N who have completed the survey.
 (a) 25% (b) 125% (c) 20% (d) 80% (e) 75%

Direction (39 – 43): Table given below shows percentage of total literate population of five (A, B, C, D & E) villages, literate male, illiterate male and total female (literate + illiterate). Read the data carefully and answer the questions.

Villages	% of literate population	Male literate	Male illiterate (in %)	Total female (Literate + Illiterate)
A	75	1050	40%	750
B	72	75%	75%	NA
C	80	1280	60%	NA
D	96	70%	50%	NA
E	85	1530	60%	1746

Note – 'NA' means some vales are missing which you have to calculate if required.

39. Find total population of village E?
 (a) 4200 (b) 3600 (c) 4000 (d) 3000 (e) 4800
40. Find difference between total male and total female population of village A?
 (a) 600 (b) 300 (c) 500 (d) 400 (e) 200
41. Find the ratio between total male population to total female population in village B?
 (a) 3 : 2 (b) 3 : 1 (c) 2 : 1 (d) 5 : 3 (e) 4 : 1
42. If the number of female graduates in village C is equal to the number of illiterate males in village C and the difference between the number of graduate female and under graduate female in village C is 120, then find the total population of village C (Note – There is only graduate and under graduate population in village C)?
 (a) 4000 (b) 2000 (c) 1250 (d) 3000 (e) 2500
43. If difference between male and female population of village D is 1152, then find total number of illiterate females in village D?
 (a) 60 (b) 40 (c) 90 (d) 120 (e) 80

Directions (44-47): Study the following table and answer the questions given below.

Table given below shows the number of car increase/decrease which is manufactured by five companies in year 2017 with respect to year 2016 and ratio of total number of diesel to total number of petrol cars manufactured in 2017 is given.

Company	No. of Increase/decrease car	Diesel car : Petrol car
Tata	120	1 : 3
Suzuki	160	3 : 1
Honda	80	5 : 3
Mahindra	220	2 : 3
Audi	240	1 : 4

44. If the average number of cars manufactured by Tata & Suzuki in 2016 is 640 then find the difference in patrol cars manufactured by Tata & Suzuki if cars manufactured by Tata in 2017 increase & cars manufactured by Suzuki in 2017 decreases? (Given that cars manufactured by Suzuki is 50% more than cars manufactured by tata in 2016) ?
 (a) 348 (b) 316 (c) 308 (d) None of these (e) 322
45. If difference of diesel cars manufactured by Honda & Audi in 2017 is 215 and ratio of total Honda and Audi cars manufactured in 2017 is 3 : 4. And if cars manufactured by both in 2017 increases with respect to 2016. Then find ratio of cars manufactured by Honda to that Audi in 2016.
 (a) 13 : 15 (b) 13 : 14 (c) None of these (d) 12 : 13 (e) 6 : 7

46. In 2017, number of petrol cars manufactured by Mahindra is 25% more than that in 2016. Petrol cars manufactured by Mahindra in 2016 is 20% of total cars manufactured by Mahindra in that year. Find total Mahindra cars manufactured in 2016 is what percent more than cars manufactured by Tata in 2017? [Given that total cars in 2017 by Tata is 1200 & diesel car manufactured by Tata is equal to diesel cars manufactured by Mahindra in same year.]
 (a) 50% (b) 40% (c) 75% (d) 55% (e) 60%
47. If Petrol cars of Honda manufactured in 2017 is 40% of total cars manufactured by Honda in 2016. And ratio of cars manufactured in 2016 of Honda to Audi is 2 : 3. Find difference in diesel & petrol cars of company Audi in 2017 ? Given that cars of Honda increase in that year.
 (a) 1224 (b) 936 (c) 1024
 (d) Cannot be determined (e) None of these

Direction (48-50): Study the table given below and answer the following questions.

Table gives information about the number of students enrolled in four different courses in five different colleges (P, Q, R, S & T).

Colleges	Total students	Courses			
		B. Com	B. Com (Hons.)	B.A.	B.Sc.
P	4,000	1,500	20%	700	1,000
Q	6,000	30%	900	1,200	2,100
R	5,000	1,000	1,500	1,200	26%
S	3,500	800	1,000	40%	300
T	8,000	25%	1,600	3,200	1,200

Note: These five colleges offer only these four courses.

48. Total number of students in B. Com in college – P & Q together are what percent more or less than total number of students in B.Sc. in colleges – R & T together?
 (a) 48% (b) 36% (c) 44% (d) 32% (e) 40%
49. Total number of students in B.A. in colleges – P & S together are how much more than average number of students in B. Com (Hons.) in colleges – P, Q & S?
 (a) 600 (b) 1,200 (c) 900 (d) 1,400 (e) 1,500
50. Find the ratio of total number of students in B. Com. in colleges – R & T together to total number of students in B.A. in colleges – P & T together.
 (a) 10:13 (b) 6:11 (c) 5:8 (d) 7:9 (e) None of the above.

Previous Years' Solutions of Mains

1. (c): Required average = $\frac{110 \times \frac{7}{22} + 120 \times \frac{13}{24} + 105 \times \frac{10}{21}}{3} = \frac{150}{3} = 50$

2. (d): In Feb 20% male of building C left = $55 \times \frac{20}{100} = 11$
 Remaining male in building C = $55 - 11 = 44$
 No. of female in building C in February = $44 \times \frac{5}{4} = 55$
 Number of female left the building C in February = $65 - 55 = 10$

3. (a): Number of people live in Building F = $80 \times \frac{120}{100} = 96$
 According to ques.
 Flat x Each person = total people
 $10 \times 2 = 20$
 $10 \times 3 = 30$
 $5 \times 4 = 20$

Remaining person = $96 - (20 + 30 + 20) = 96 - 70 = 26$

In remaining flats there is only 1 person live in each flat so,
 $26 \times 1 = 26$

Total number of flat = $10 + 10 + 5 + 26 = 51$

4. (b): No. of females in building D = $100 \times \frac{2}{5} = 40$
 No. of females in building E = $105 \times \frac{10}{21} = 50$
 So, required % = $\frac{(50-40)}{50} \times 100 = 20\%$

5. (d): Number of people in building G = $105 \times \frac{24}{21} = 120$
 Ratio of male and female in building E = 2:3
 So, number of males = $120 \times \frac{2}{5} = 48$

6. (c): Male in February in building A

$$= \frac{(75+55)}{2} = \frac{130}{2} = 65$$

Female in February in building A = 65+5=70

Total number of people in February in building A
= 70 + 65 = 135

7. (b): Number of tickets sold to males by C3 and C6 theatre together

$$= (80 - 20) \times \frac{2}{5} + (80 - 12) \times \frac{9}{17}$$

$$= 60 \times \frac{2}{5} + 68 \times \frac{9}{17}$$

$$= 24 + 36$$

$$= 60$$

Number of tickets sold to females by C3 and C5 theatre together

$$= (80 - 20) \times \frac{3}{5} + (80 - 8) \times \frac{4}{9}$$

$$= 60 \times \frac{3}{5} + 72 \times \frac{4}{9}$$

$$= 36 + 32 = 68$$

$$\text{Required ratio} = \frac{60}{68} = \frac{15}{17}$$

8. (d): Number of female who bought ticket from C2 and C4 theatre together

$$= (80 - 10) \times \frac{4}{7} + (80 - 14) \times \frac{5}{11}$$

$$= 40 + 30$$

$$= 70$$

Number of male who bought ticket from C5 theatre

$$= (80 - 8) \times \frac{5}{9}$$

$$= 72 \times \frac{5}{9}$$

$$= 40$$

$$\text{Required \%} = \frac{70-40}{40} \times 100$$

$$= \frac{30}{40} \times 100 = 75\%$$

9. (c): Total revenue earns by C4 theatre

$$= 14 \times 150 + (80 - 14) \times \frac{6}{11} \times 200 + (80 - 14) \times$$

$$\frac{5}{11} \times 250$$

$$= 2100 + 66 \times \frac{6}{11} \times 200 + 66 \times \frac{5}{11} \times 250$$

$$= 2100 + 7200 + 7500$$

$$= 16800$$

10. (b): Number of male who bought ticket from C1, C2 and C3 together

$$= (80 - 15) \times \frac{6}{13} + (80 - 10) \times \frac{3}{7} + (80 - 20) \times \frac{2}{5}$$

$$= 30 + 30 + 24$$

$$= 84$$

$$\text{Required average} = \frac{84}{3} = 28$$

11. (a): Number of males who bought ticket from C4, C5 and C6 together

$$= (80 - 14) \times \frac{6}{11} + (80 - 8) \times \frac{5}{9} + (80 - 12) \times \frac{9}{17}$$

$$= 36 + 40 + 36$$

$$= 112$$

Number of females who bought ticket from C4, C5 and C6 together

$$= (80 - 14) \times \frac{5}{11} + (80 - 8) \times \frac{4}{9} + (80 - 12) \times \frac{8}{17}$$

$$= 30 + 32 + 32$$

$$= 94$$

$$\text{Required difference} = 112 - 94 = 18$$

12. (a): Required difference

$$= (200 - 55) \times \frac{80}{100} - (180 - 60) \times \frac{40}{100} = 116 - 48$$

$$= 68$$

13. (d): Required total

$$= (180 - 60) + (150 - 50) + (200 - 55) + (250 - 130)$$

$$= 120 + 100 + 145 + 120 = 485$$

14. (b): Required % = $\frac{(250-130) \times \frac{30}{100}}{200} \times 100$

$$= \frac{3600}{200} = 18\%$$

15. (e): Required Ratio = $\frac{(150-50)}{55} = \frac{100}{55} = 20 : 11$

16. (c): Required average

$$= \frac{1}{3} \left[(180 - 60) \times \frac{60}{100} + (150 - 50) \times \frac{45}{100} + \right.$$

$$\left. (250 - 130) \times \frac{70}{100} \right]$$

$$= \frac{1}{3} [72 + 45 + 84] = 67$$

17. (d): Required percentage

$$= \frac{\frac{1}{3} \times \frac{40}{100} (180 - 60)}{(250 - 130) \times \frac{70}{100}} \times 100$$

$$= \frac{1600}{84} = 19 \frac{1}{21} \%$$

18. (a): Total man working on odd days in March =

$$\frac{1000 \times 30}{100} = 300$$

Total odd days in March = 16

Total man hour = 300 × 16 × 8

Similarly,

Total man hour of April on even days = 15 × 8 × 1200

$$\text{Required \%} = \frac{300 \times 16 \times 8}{15 \times 8 \times 1200} \times 100 = 26 \frac{2}{3} \%$$

19. (d): Total man hour of April = $\frac{1500}{100} \times [20 \times 15 + 80 \times$

$$15] \times 8$$

$$= 1,80,000$$

Total man hour of August

$$= 750 \times \frac{40}{100} \times 15 \times 8 + 16 \times 750 \times \frac{60}{100} \times 8$$

$$= 36000 + 57600$$

$$= 93,600$$

$$\text{Required difference} = 1,80,000 - 93,600 = 86,400$$

20. (b): Required ratio = $\frac{10 \times 15 \times 70 \times 8}{15 \times 75 \times 4 \times 8} = 7 : 3$

21. (c): Man-hour on odd days on April = $15 \times 300 \times 8 = 36000$
 Man-hour on odd days on August = $16 \times 75 \times 6 \times 8 = 57600$
 $\text{required \%} = \frac{57600 - 36000}{57600} \times 100 = 37.5\%$

22. (a): Man-hour on even days \rightarrow
 March = $15 \times 8 \times 700 = 84,000$
 April = $15 \times 8 \times 1200 = 1,44,000$
 August = $15 \times 8 \times 300 = 36,000$
 Required Average = 88,000

23. (c): Offline contestant in village A = $\frac{350}{56} \times 44 = 275$
 Online contestant who complete the survey = 350
 $- 61 = 289$
 Offline contestant who complete the survey = 275
 $- 61 = 214$
 $\therefore \text{Required \%} = \frac{289 - 214}{214} \times 100 \approx 35\%$

24. (a): Total no. of contestant from village C who complete the survey
 $= \left[465 + \left(\frac{465}{60} \times 40 \right) \right] - 108 \approx 667$
 Total no. of contestant from village B who complete the survey
 $= \left[560 + \left(\frac{560}{35} \times 65 \right) \right] - 92 = 1508$
 $\therefore \text{Required number} = 1508 - 667 = 841$

25. (c): Online contestant who didn't completed the survey = $\frac{8}{19} \times 190 = 80$
 Offline contestant who didn't completed the survey $8 = \frac{11}{19} \times 190 = 110$
 \therefore Males in Online contestant who completed the survey
 $= \frac{65}{100} \times (480 - 80) = 260$
 and
 females in offline contestants who completed the survey
 $= \frac{60}{100} \times \left(\frac{480}{40} \times 60 - 110 \right) = 366$
 \therefore Required difference = $(480 - 80 - 260) \sim (720 - 110 - 366)$
 $= 140 \sim 244 = 104$

26. (d): Offline contestants of village C = $\frac{465}{60} \times 40 = 310$
 Offline contestants of village A = $\frac{350}{56} \times 44 = 275$
 \therefore Required difference = 35

27. (a): Required sum
 $= \frac{350}{56} \times 12 + \frac{560}{35} \times 30 + \frac{465}{60} \times 20 + \frac{480}{40} \times 20$
 $= 75 + 480 + 155 + 240$
 $= 950$

28. (d): Number of said contestants from village C
 $= \frac{465}{60} \times 100 - 108$
 $= 667$
 and number of said contents from village D
 $\frac{480}{40} \times 100 = 1200$
 \therefore Required percentage = $\frac{667}{1200} \times 100$
 $= 56\%$

29. (b): Tax = $\frac{30}{100} \times 5 \text{ crore}$
 $= 1.5 \text{ crores}$
 Penalty = $\frac{30}{100} \times 1.5 \text{ crore}$
 $= 0.45 \text{ crore}$
 Total Tax = $1.5 + 0.45$
 $= 1.95 \text{ crore}$
 \therefore Required money = $(5 - 1.95)$
 $= 3.05 \text{ crores.}$

30. (b): Money that he will get $\rightarrow 3,25,000 - \frac{10}{100} \times 3,25,000 - \frac{55}{100} \times \left(\frac{10}{100} \times 3,25,000 \right)$
 $= 2,74,625 \text{ Rs.}$
 \therefore Required no. of day = $\frac{274625}{65000}$
 $= 4.225$
 $\approx 5^{\text{th}} \text{ day}$

31. (e): Required Ratio = $\frac{3,00,000}{60,000}$
 $= \frac{30}{6}$
 $= 5 : 1$

32. (a): Tax = $\frac{30}{100} \times 20 \text{ crore}$
 $= 6 \text{ crores}$
 Penalty = $\frac{55}{100} \times 6 \text{ crore}$
 $= 3.3 \text{ crore}$
 \therefore Total tax $\rightarrow 9.3 \text{ crores}$
 \therefore Required amount = $\frac{25}{100} \times 9.3 \text{ crores}$
 $= 2.325 \text{ crores}$
 $= 2,32,50,000$

33. (d): Required days = $\frac{5200000}{65000} - \frac{500000}{10000} = 80 - 50 = 30$ days

34. (b): Let no. of contestants who have not completed online survey = x
 \Rightarrow No. of contestants who have not completed offline survey = $1.125x$

ATQ—

$$x + 1.125x = 153$$

$$\Rightarrow 2.125x = 153$$

$$\Rightarrow x = \frac{153}{2.125} = 72$$

No. of contestants who completed offline survey

$$= \frac{792}{55} \times 195 - 72 \times 1.125$$

$$= 648 - 81$$

$$= 567$$

No. of contestants who completed online survey

$$= 792 - 72 = 720$$

$$\text{Required}\% = \frac{567}{720} \times 100$$

$$= 78.75\%$$

35. (e): Online contestants who have not completed the survey

$$= \frac{35}{100} \times 120 = 42$$

Offline contestants who have not completed the survey

$$= \frac{65}{100} \times 120 = 78$$

Total no. of offline contestants

$$= \frac{630}{42} \times 58 = 870$$

Online contestants who have completed the survey = $630 - 42 = 588$

Offline contestants who have completed the survey = $870 - 78 = 792$

$$\text{Required difference} = 792 - 588 = 204$$

36. (b): Contestants who have not completed online survey

$$= \frac{10}{17} \times 306 = 180$$

Contestants who have not completed offline survey

$$= \frac{7}{17} \times 306 = 126$$

Contestants who have not completed online survey

$$= 1185 - 180 = 1008$$

Contestants who have not completed offline survey

$$= \frac{188}{72} \times 28 - 126$$

$$= 462 - 126 = 336$$

$$\text{Required ratio} = \frac{336}{1008} = \frac{1}{3}$$

37. (a): Total number of contestant in village Q who completed survey

$$= \frac{792}{55} \times 100 - 153$$

$$= 1440 - 153$$

$$= 1287$$

Total number of contestant in village P who completed survey

$$= \frac{486}{36} \times 100 - 45$$

$$= 1350 - 45$$

$$= 1305$$

$$\text{Required difference} = 1305 - 1287 = 18$$

38. (d): Total contestants of village M who have completed the survey

$$= \frac{576}{48} \times 100 - 96$$

$$= 1200 - 96$$

$$= 1104$$

Total contestants of village N who have completed the survey

$$= \frac{630}{42} \times 100 - 120$$

$$= 1500 - 120$$

$$= 1380$$

$$\text{Required \%} = \frac{1104}{1380} \times 100 = 80\%$$

39. (b): Let total population of village E = $100x$

Total literate population of village E = $100x$

$$\times \frac{85}{100} = 85x$$

And total illiterate population of village E = $100x - 85x = 15x$

Given, literate male population of village E = 1530

So, total literate female population of village E = $85x - 1530$

Total illiterate male population of village E = $15x$

$$\times \frac{60}{100} = 9x$$

And, total illiterate female population of village E = $15x - 9x = 6x$

ATQ –

$$6x + 85x - 1530 = 1746$$

$$91x = 3276$$

$$x = 36$$

So, total population of village E = $100 \times 36 = 3600$

40. (c): Let total population of village A = $100x$

Total literate population of village A = $100x$

$$\times \frac{75}{100} = 75x$$

And total illiterate population of village A = $100x - 75x = 25x$

Given, total literate male population of village A = 1050

So, total literate female population of village A = $75x - 1050$

Total illiterate male population of village A = $25x$
 $\times \frac{40}{100} = 10x$
 And total illiterate female population of village A = $25x - 10x = 15x$
 ATQ -
 $75x - 1050 + 15x = 750$
 $90x = 1800$
 $x = 20$
 Required difference = $(1050 + 10 \times 20) - 750$
 $= 1250 - 750 = 500$

- 41. (b):** Let total population of village B = $100x$
 Total literate population of village B = $100x$
 $\times \frac{72}{100} = 72x$
 And total illiterate population of village B = $100x - 72x = 28x$
 Total literate male population of village B = $72x$
 $\times \frac{75}{100} = 54x$
 And total literate female population of village B = $72x - 54x = 18x$
 Total illiterate male population of village B = $28x$
 $\times \frac{75}{100} = 21x$
 And total illiterate female population of village B = $28x - 21x = 7x$
 Required ratio = $(54x + 21x) : (18x + 7x)$
 $= 75x : 25x = 3 : 1$

- 42. (e):** Let total population of village C = $100x$
 Total literate population of village C = $100x$
 $\times \frac{80}{100} = 80x$
 And total illiterate population of village C = $100x - 80x = 20x$
 Given, total literate male population of village C = 1280
 So, total literate female population of village = $(80x - 1280)$
 And total illiterate male population of village C = $20x \times \frac{60}{100} = 12x$
 So, total illiterate female population of village C = $20x - 12x = 8x$
 Given, total female graduate female in village C = number of illiterate males in village C = $12x$
 ATQ -
 $56x - 1280 = 120$
 $56x = 1400$
 $x = 25$
 So, total population of village C = $100 \times 25 = 2500$

- 43. (a):** Let total population of village D = $100x$

Total literate population of village D = $100x$
 $\times \frac{96}{100} = 96x$
 And total illiterate population of village D = $100x - 96x = 4x$
 Total literate male population of village D = $96x$
 $\times \frac{70}{100}$
 Total literate female population of village D = $96x \times \frac{30}{100}$
 Total illiterate male population of village D = $4x$
 $\times \frac{50}{100} = 2x$
 So, illiterate female population of village D = $4x - 2x = 2x$
 ATQ -
 $(96x \times \frac{70}{100} + 2x) - (96x \times \frac{30}{100} + 2x) = 1152$
 $69.2x - 30.8x = 1152$
 $38.4x = 1152$
 $x = 30$
 So, total number of illiterate females in village D = $2 \times 30 = 60$

- 44. (e):** Total cars manufactured in 2016 by Tata & Suzuki together = $640 \times 2 = 1280$
 Let cars manufactured by Tata in 2016 be x
 \therefore cars manufactured by Suzuki = $1.5x$
 ATQ,
 $2.5x = 1280$
 $x = 512$ = Cars manufactured by Tata in 2016
 \therefore Cars manufactured by Suzuki in 2016 = $1.5 \times 512 = 768$
 Petrol cars manufactured by Tata in 2017 = $(512 + 120) \times \frac{3}{4} = 474$
 Petrol cars manufactured by Suzuki in 2017 = $(768 - 160) \times \frac{1}{4} = 152$
 Required difference = $474 - 152 = 322$

- 45. (b):** Let Honda & Audi cars manufactured in 2017 is $3x$ & $4x$ respectively.
 ATQ,
 $3x \times \frac{5}{8} - 4x \times \frac{1}{5} = 215$
 $\frac{75x - 32x}{40} = 215$
 $\therefore x = 200$
 Honda cars manufactured in 2016 = $3 \times 200 - 80 = 520$
 Audi cars manufactured in 2016 = $4 \times 200 - 240 = 560$
 Required ratio = $\frac{520}{560} = 13 : 14$

46. (a): Diesel cars manufactured by Mahindra in 2017
 = diesel cars manufactured by Tata in 2017
 $= 1200 \times \frac{1}{4}$
 $= 300$
 Hence petrol cars manufactured by Mahindra in 2017 is $300 \times \frac{3}{2} = 450$
 Petrol cars manufactured by Mahindra in 2016
 $= 450 \times \frac{100}{125}$
 $= 360$
 \therefore Total cars manufactured by Mahindra in 2016
 $= \frac{360}{20} \times 100 = 1800$
 Required percentage $= \frac{1800 - 1200}{1200} \times 100$
 $= 50\%$

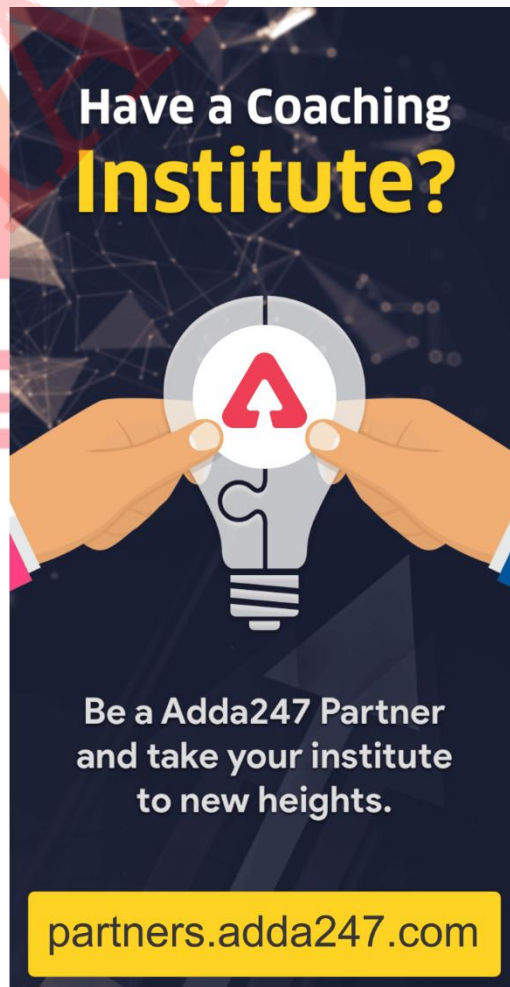
47. (d): Let total cars manufactured in 2016 by company Honda be x
 ATQ,
 $x \times \frac{2}{5} = (x + 80) \times \frac{3}{8}$
 $16x = 15x + 1200$
 $\therefore x = 1200$
 \therefore cars manufactured of company Audi in 2016
 $= \frac{1200}{2} \times 3 = 1800$
 Since it is not clear that cars manufactured is increasing or decreasing of company Audi.
 \therefore Cannot be determined.

48. (d): Total number of students in B. Com in college - P & Q together $= 1,500 + \left(6,000 \times \frac{30}{100}\right)$
 $= 1,500 + 1,800$
 $= 3,300$
 Total number of students in B.Sc. in colleges - R & T together $= \left(5,000 \times \frac{26}{100}\right) + 1,200$
 $= 1,300 + 1,200$
 $= 2,500$
 Required percentage $= \frac{3,300 - 2,500}{2,500} \times 100 = 32\%$

49. (b): Total number of students in B.A. in colleges - P & S together $= 700 + \left(\frac{40}{100} \times 3,500\right)$
 $= 700 + 1,400$
 $= 2,100$

Average number of students in B. Com (Hons.) in colleges - P, Q & S $= \frac{1}{3} \times \left(\left(\frac{20}{100} \times 4,000\right) + 900 + 1,000\right)$
 $= \frac{1}{3} \times (800 + 900 + 1,000)$
 $= 900$
 Required difference $= 2,100 - 900 = 1,200$

50. (a): Total number of students in B. Com. in colleges - R & T together $= 1,000 + \left(8,000 \times \frac{25}{100}\right)$
 $= 1,000 + 2,000$
 $= 3,000$
 Total number of students in B.A. in colleges - P & T together $= 700 + 3,200 = 3,900$
 Required ratio $= \frac{3,000}{3,900}$
 $= 10:13$



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(ii) Missing Table DI: In missing table DI, where some values or data of the table DI is not provided or missing and we need to find those missing values with the help of the questions associated with the DI or some notes and data provided with the DI.

(ii) Missing Table DI contain:

- Concept with Solved Examples
- Practice MCQs for Prelims
- Practice MCQs for Mains
- Previous Years' Questions for Prelims
- Previous Years' Questions for Mains

Solved Examples of Missing Table DI

Directions (1 - 5): Refer to the table given below and answer the given questions.

Data related to the number of employees in 5 different companies in December 2008

Company	Total number of employees	Out of total number of employees		
		Percentage of Arts graduates	Percentage of Science graduates	Percentage of commerce graduates
X	–	30%	30%	–
Y	–	–	40%	20%
Z	–	35%	50%	–
K	1000	32%	–	–
L	600	–	42%	30%

Note: Some values are missing, you have find out these value according to the question.

Note: Suppose that all the employees are graduated.

1. What is the difference between the number of commerce graduates' employees and Arts graduates employees in company L?
 (a) 12 (b) 18 (c) 10 (d) 22 (e) 15

Sol. (a); Number of commerce graduates' employees = $30\% \text{ of } 600 = \frac{30}{100} \times 600 = 180$
 Number of arts graduates employees = $28\% \text{ of } 600 = 168$
 \therefore Difference = $180 - 168 = 12$

2. The average number of commerce graduates' employees and science graduate employees in company Z was 338. What was the total number of employees in company Z?
 (a) 1020 (b) 1140 (c) 1040 (d) 1240 (e) 940

Sol. (c); Average number of commerce graduate employees and science graduate employees in company Z = 338
 Total number of commerce and science graduate employees in company Z = 676
 Total number of employees in Z = $676 \times \frac{100}{65} = 1040$

3. If the respective ratio between the number of science graduate and commerce graduate employees in company K was 10 : 7. What was the number of commerce graduate employees in K?
 (a) 180 (b) 280 (c) 380 (d) 80 (e) 250

Sol. (b); Number of Arts graduate employees = $\frac{32}{100} \times 1000 = 320$
 Number of science graduate and commerce graduate employees = $1000 - 320 = 680$
 \therefore Number of commerce graduate employees in K = $680 \times \frac{7}{17} = 280$

4. Total number of employees in company L increased by 20% from December 2008 to December 2009. If 20% of the total number of employees in company L in December 2009 was Arts graduate, what was the number of Arts graduate employees in company L in December 2009?
 (a) 144 (b) 169 (c) 244 (d) 104 (e) 124

Sol. (a); Total employees in company L in 2009 = $600 \times \frac{120}{100} = 720$
 Arts Graduate in company L in December 2009 = $\frac{20}{100} \times 720 = 144$

5. Total number of employees in company X was three time the total number of employees in company Y. If the difference between number of commerce graduate employees in company Y and that of science graduate employees in same company was 120, what was the total number of employees in company X?
 (a) 600d (b) 1200 (c) 1800 (d) 3000 (e) 2400

Sol. (c); $(40\% - 20\%)$ of number of employees in company Y = 120

\therefore Number of employees in company Y = 600

\therefore Total number of employees in company X = 1800

Directions (6-10): Study the table and answer the given questions.

Data related to candidates appeared and qualified from State 'x' in a competitive exam during 5 years

Note: Total appeared candidates = Total qualified candidates+ Total Unqualified candidates

Years	No. of appeared candidates	% of appeared candidates who unqualified	Respective ratio of number of qualified male and number of qualified female candidates
2006	700	--	3 : 2
2007	--	50%	2 : 3
2008	480	40%	--
2009	--	70%	4 : 5
2010	900	36%	--

Note: Some values are missing. You have to calculate these value as per data given in the questions.

6. In 2007, number of males who qualified were 50% of the number of males who qualified in 2010. Find total number of appeared candidates in 2007 if respective ratio of number of qualified male and female candidates is 13 : 11 in 2010.

(a) 760 (b) 728 (c) 720 (d) 740 (e) 780

Sol. (e); *No. of male candidates who qualified in 2010*

$$= \frac{(100-36)}{100} \times 900 \times \frac{13}{24} = 312$$

No. of males who qualified in 2007

$$= 312 \times \frac{50}{100} = 156$$

Total no. of appeared candidates who qualified in 2007

$$= \frac{156}{2} \times 5 = 390$$

Total no. of appeared candidates in 2007

$$= \frac{390}{50} \times 100 = 780$$

7. If the ratio between number of qualified male in 2007 and the number of qualified male in 2009 is 4 : 3 and total number of male qualified in 2007 and 2009 together are 392 then number of candidates appeared in 2007 are what percent of the number of candidates appeared in 2009 ?

(a) $89\frac{1}{3}\%$ (b) $84\frac{3}{4}\%$ (c) $88\frac{8}{9}\%$ (d) $87\frac{3}{7}\%$ (e) $88\frac{7}{9}\%$

Sol. (c); *No. of qualified male in 2007* = $\frac{4}{7} \times 392 = 224$

$$\text{No. of qualified male in 2009} = \frac{3}{7} \times 392 = 168$$

No. of appeared candidates in 2007

$$= \frac{224}{2} \times 5 \times \frac{1}{50} \times 100 = 1120$$

No. of appeared candidates in 2009

$$= \frac{168}{4} \times 9 \times \frac{1}{30} \times 100 = 1260$$

$$\text{Required}\% = \frac{1120}{1260} \times 100 = 88\frac{8}{9}\%$$

8. If the ratio between number of qualified female in 2008 and number of qualified female in 2010 is 3 : 7 and the number of qualified male in 2008 is same as number of qualified male in 2010. Then find the total number of qualified female candidates in 2008 and 2010 together?

(a) 756 (b) 688 (c) 725 (d) 720 (e) 696

Sol. (d); Let no. of qualified male in 2008 and 2010 = x

Let no. of qualified female in 2008 and 2010 $3y$ and $7y$ respectively

Then, $x + 3y = 288$... (i)

and $x + 7y = 576$... (ii)

from (i) and (ii) $y = 72$

No. of qualified female candidates in 2008 and 2010 together = $72(3 + 7) = 720$

9. If in 2011 Number of appeared candidates are 125% of the number of qualified candidates in 2008 then find the number of unqualified females in 2011 if the ratio of number of unqualified male and number of unqualified female candidates is 7 : 3. Number of appeared candidates who qualified in 2011 are 376 less than the number of appeared candidates who qualified in 2010

(a) 48

(b) 36

(c) 56

(d) 72

(e) 64

Sol. (a); No. of appeared candidates in 2011 = $\frac{125}{100} \times \frac{60}{100} \times 480 = 360$

No. of appeared candidates who qualified in 2011 = $576 - 376 = 200$

No. of unqualified females in 2011 = $\frac{3}{10}(360 - 200) = \frac{3}{10} \times 160 = 48$

10. Number of qualified candidates in 2008 are what percent more/less than the number of qualified candidates in 2010?

(a) 60%

(b) 55%

(c) 25%

(d) 40%

(e) 50%

Sol. (e); Required % = $\frac{576-288}{576} \times 100 = 50\%$

Directions (11-15): Given below is the table which shows the number of appeared and percentage of appeared candidates who qualify the examination from two given states A and B in different years.

Year	State A		State B	
	Number of appeared candidates	% of appeared candidates who qualified	Number of appeared candidates	% of appeared candidates who qualified
2010	900	60%	760	30%
2011	1200	43%	—	40%
2012	—	60%	520	60%
2013	960	70%	400	70%
2014	760	—	660	—

Note: Some values are missing in table. You have to calculate these values if required to answer these question.

11. Out of number of qualified candidates from state A in 2012 the ratio of male to female candidates is 7 : 5 and difference between qualified male and qualified female from state A in 2012 is 102 then what is the total number of candidates who appeared from state A in 2012.

(a) 900

(b) 850

(c) 770

(d) 880

(e) 1020

Sol. (e); Let qualified male from state A in 2012 = $7x$

And qualified female from state A in 2012 = $5x$

According to question $2x = 102$

$x = 51$

Total appeared candidates = $\frac{12 \times 51}{60} \times 100 = \frac{12 \times 51 \times 5}{3} = 1020$

12. If number of appeared candidates from state B in 2011 is $33\frac{1}{3}\%$ more than appeared candidates from state B in 2014 and ratio of passed candidates from same state and same years i.e. 2011 and 2014 is 11 : 12 then what is the sum of total passed candidates from same state and same years.

(a) 545

(b) 660

(c) 736

(d) 884

(e) 568

Sol. (c); Number of appeared candidate from state B in 2011 = $\frac{4}{3} \times 660 = 880$

According to question = $880 \times \frac{40}{100} \times \frac{1}{11} \times (11+12) = 736$

13. What is the ratio of candidates passed from state A in 2010, 2011 and 2013 together to the ratio of candidates passed from state B in 2010, 2012 and 2013 together.

(a) 432 : 331 (b) 423 : 205 (c) 432 : 205 (d) 200 : 343 (e) 254 : 255

Sol. (c); Required ratio = $\frac{9 \times 60 + 12 \times 43 + 96 \times 7}{76 \times 3 + 52 \times 6 + 4 \times 70}$
 $= \frac{540 + 516 + 672}{228 + 312 + 280} = \frac{1728}{820} \Rightarrow = 432 : 205$

14. Number of candidates qualified from state A in year 2010 is what percent more or less than number of candidates qualified from state B in year 2013

(a) $70\frac{2}{3}\%$ (b) $66\frac{2}{3}\%$ (c) $92\frac{6}{7}\%$ (d) $88\frac{3}{5}\%$ (e) $88\frac{1}{3}\%$

Sol. (c); Required% = $\frac{9 \times 60 - 4 \times 70}{4 \times 70} \times 100$
 $= \frac{260}{280} \times 100 = \frac{13}{14} \times 100 = 92\frac{6}{7}\%$

15. If from state A sum of candidates who qualified in 2013 and 2014 is 1356 then what percent of candidates remain unqualified from state A in 2014

(a) 10% (b) 5% (c) 8% (d) 15% (e) 12%

Sol. (a); Total passed candidate from state A in 2014
 $= 1356 - 96 \times 7 = 684$
 Required% = $\frac{760 - 684}{760} \times 100 = \frac{76}{760} \times 100 = 10\%$

Directions (16-20): Study the table carefully and answer the given questions. Data related to number of employees in 5 different organizations in April 2013

Companies	Total number of employees	Out of the total number of employees		
		Percentage of science graduate	Percentage of commerce graduates	Percentage of arts graduates
A	—	40%	30%	—
B	—	40%	—	25%
C	900	—	44%	35%
D	1300	48%	—	—
E	—	30%	—	50%

Note :

- (i) Employees of the given companies can be categorized only in three types — Science graduates, Commerce graduates and Arts graduates.
 (ii) Few values are missing in the table (indicated by —). A candidate is expected to calculate the missing value, if it is required to answer the given question, on the basis of the given data and information.

16. The average number of science graduate employees and Commerce graduate employees in Company A was 518. What is the total number of employees in Company A ?

(a) 1480 (b) 1520 (c) 1560 (d) 1580 (e) 1440

Sol. (a): Required employees = $\frac{1036}{70} \times 100 = 1480$

17. Total number of employees in Company E was 3 times the total number of employees in Company B. If the difference between number of Commerce graduate employees in Company E and that in Company B was 300, what was the total number of employees in Company B ?

(a) 900 (b) 1500 (c) 1200 (d) 1320 (e) 1290

Sol. (c): Let total employees in Company B = x
 Let total employees in Company E = 3x
 $\therefore (100 - 50 - 30)\%$ of 3x = $(100 - 40 - 25)\%$ of x
 $x = 300$ x = 1200

18. If the respective ratio between number of Arts graduate employees and Commerce graduate employees in Company D was 4 : 9, what was the number of Arts graduate employees in Company D ?

(a) 236 (b) 232 (c) 208 (d) 224 (e) 216

Sol. (c): Arts and Commerce graduate employees

$$= \frac{52}{100} \times 1300 = 676$$

$$\text{Arts graduate employees} = \frac{4}{13} \times 676 = 208$$

19. Total number of employees in Company C increased by 40% from April, 2013 to April, 2014. If 50% total number of employees in Company C in April, 2014 were Commerce graduates, what was the number of commerce graduate employees in Company C in April 2014 ?

(a) 650 (b) 630 (c) 590 (d) 570 (e) 510

Sol. (b): Total number of employee in Company C in April 2014 = $\frac{900 \times 140}{100} = 1260$

$$\therefore \text{Required employees} = \frac{1260}{2} = 630$$

20. What was the difference between number of Science graduate employees and Arts graduate employees in Company C ?

(a) 136 (b) 132 (c) 128 (d) 122 (e) 126

Sol. (e): % of Science graduate employees in company C

$$= (100 - 44 - 35)\% = 21\%$$

$$\text{Required difference} = (35 - 21)\% \text{ of } 900 = 126$$

Directions (21-25): Table given below shows the total population of 5 cities in 5 different years. Another table show percentage rise of population in these cities every years. Study the table and solve the given questions:

	2012	2013	2014	2015	2016
A	—	—	—	3,04,175	—
B	—	—	1,45,200	—	—
C	—	1,80,000	—	—	—
D	1,60,000	—	—	—	—
E	—	—	—	—	5,37,824

	A	B	C	D	E
Percentage rise of population every year	15%	10%	20%	25%	40%

Note:-

- Percentage rise in population is consistent every year.
- Some data is missing in the table. Find the data according to the question.

21. Find the ratio of population of city D in 2013 to population of city A in the same year?

(a) 23 : 20 (b) 21 : 20 (c) 20 : 21 (d) 19 : 17 (e) 20 : 23

Sol. (e); Population of city D in 2013 = $1,60,000 \times \frac{125}{100}$

$$= 2,00,000$$

$$\text{Population of city A in 2013} = 3,04,175 \times \frac{100}{115} \times \frac{100}{115}$$

$$= 2,30,000$$

$$\text{Desired Ratio} = \frac{2,00,000}{2,30,000} = \frac{20}{23}$$

22. Population of city B in 2016 is approximately what percent more than the population of city C in 2012?

(a) 11% (b) 17% (c) 22% (d) 27% (e) 32%

Sol. (b); Population of city B in 2016

$$= 1,45,200 \times \frac{110}{100} \times \frac{110}{100}$$

$$= 1,75,692$$

Population of city C in 2012

$$= 1,80,000 \times \frac{100}{120} = 1,50,000$$

$$\text{Desired percentage} = \frac{1,75,692 - 1,50,000}{1,50,000} \times 100$$

$$= \frac{25,692}{1,50,000} \times 100 \Rightarrow = 17.128 \approx 17\%$$

23. Population of city C in 2014 is what percentage of the population of city B in 2012?

- (a) 80% (b) 120% (c) 180% (d) 240% (e) 300%

Sol. (c); Population of city C in 2014

$$= 1,80,000 \times \frac{120}{100} = 2,16,000$$

Population of city B in 2012

$$= 1,45,200 \times \frac{100}{110} \times \frac{100}{110} \Rightarrow = 1,20,000$$

$$\text{Desired percentage} = \frac{2,16,000}{1,20,000} \times 100 = \frac{216}{120} \times 100 = 180\%$$

24. What is the average population of city C, D and E in year 2012?

- (a) 1,40,000 (b) 1,45,000 (c) 1,48,000 (d) 1,50,000 (e) 1,52,000

Sol. (d); Population of city C in 2012

$$= 1,80,000 \times \frac{100}{120}$$

$$= 1,50,000$$

Population of city D in 2012 = 1,60,000

Population of city E in 2012

$$= 537824 \times \left[\frac{100}{140} \right]^4 \Rightarrow = 1,40,000$$

$$\text{Desired average} = \frac{1,50,000 + 1,60,000 + 1,40,000}{3} = 1,50,000$$

25. What is the ratio of the population of city B and C together in 2012 to the city D and E together in 2013?

- (a) 22 : 15 (b) 15 : 22 (c) 14 : 23 (d) 23 : 14 (e) 15 : 23

Sol. (b); Population of B = 2012 = 1,20,000

Population of C in 2012 = 1,50,000

Population of B and C together in 2012 = 2,70,000

$$\text{Population of D in 2013} = 1,60,000 \times \frac{125}{100}$$

$$= 2,00,000$$

$$\text{Population of E in 2013} = 5,37,824 \times \left[\frac{100}{140} \right]^3 = 1,96,000$$

Population of D and E together in 2013 = 3,96,000

$$\text{Required Ratio} = \frac{2,70,000}{3,96,000} = \frac{15}{22}$$

Directions (26-30): Given below is the percent of number of students from 5 different colleges attended different number of seminars.

	No. of seminars Attended - 1	No. of seminars Attended - 2	No. of seminars Attended - 3	No. of seminars Attended - 4	No. of seminars Attended - 5	No. of seminars Attended - 6
P	19	16	21	9	—	12
Q	—	18	24	—	—	20
R	10	18	29	—	—	—
S	—	—	29	11	24	10
T	16	—	25	—	31	6

Note: Every student attended at least 1 seminar so there is no student from every college who did not attend the seminars.

26. If the number of students from college R who attended at most 3 seminars is equal to number of students from college S who attended at least 3 seminars and the total number of students from College S is 11400. Then find total the number of students from college R.
 (a) 14800 (b) 41900 (c) 15300 (d) 12400 (e) 13000
26. (a); $\frac{(10+18+29)}{100} \times R = \left(\frac{29+11+24+10}{100}\right) S$
 $\frac{57}{100} R = \frac{74}{100} \times S$
 $57R = 74S \Rightarrow \frac{R}{S} = \frac{74}{57}$
 Given $57 \rightarrow 11400$
 $74 \rightarrow \frac{11400}{57} \times 74 = 14800$
27. Total no. of students from college P who attended at most 2 seminars is equal to the sum of number of students from college T who attended 1 seminar and the number of students from the same college who attended 6 seminars. Then the total number of students from college P is what percent of total no. of student from college T?
 (a) $57\frac{1}{7}\%$ (b) $62\frac{6}{7}\%$ (c) $62\frac{4}{7}\%$ (d) $57\frac{6}{7}\%$ (e) $47\frac{3}{7}\%$
27. (b); $(19 + 16)\%$ of P = $(16 + 6)\%$ of T
 $35 \times P = 22 T \Rightarrow \frac{P}{T} = \frac{22}{35}$
 Required % = $\frac{22}{35} \times 100 = 62\frac{6}{7}\%$
28. The number of students from college P who attended more than 2 seminars is approximately what percent less than the number of students from college S who attended at least 3 seminars if the number of students who attended 2 seminars from college P is 48 and the number of students of college S who attended 6 seminars is 48 more than the number of students from college P, who attended 1 seminar?
 (a) 77% (b) 74% (c) 71% (d) 75% (e) 73%
28. (d); $P = \frac{48}{16} \times 100 = 300$
 $S \rightarrow = \left(\frac{48+57}{10}\right) \times 100 = 1050$
 No. of students who attended more than 2 Seminar from college P = $\frac{100-19-16}{100} \times 300 = 195$
 No. of students who attended at least 3 seminars from college S = $\frac{29+11+24+10}{100} \times 1050 = 777$
 Required % = $\frac{777-195}{777} \times 100 \approx 75\%$
29. If the difference between number of students from college T who attended 3 seminars and students who attended 5 seminars is 60, and the total students from college R is 60% of the total students from college T then find the number of students of college R who are attending 2 seminars.
 (a) 116 (b) 104 (c) 136 (d) 108 (e) 105
29. (d); $\frac{31-25}{100} \times T = 60$
 $\frac{6}{100} \times T = 60 \Rightarrow T = 1000$
 $R = \frac{60}{100} \times 1000 = 600$
 Required No. of students = $\frac{18}{100} \times 600 = 108$
30. No. of students who attended at most 2 seminars from college S are what percent more/less than the no. of students who attended at least 3 seminars from the same college ?
 (a) $184\frac{11}{13}\%$ (b) $184\frac{7}{13}\%$ (c) $184\frac{8}{13}\%$
 (d) can't be determined (e) None of these
30. (c); Required % = $\frac{74-26}{26} \times 100$
 $= \frac{48}{26} \times 100 = 184\frac{8}{13}\%$

Practice MCQs for Prelims

Directions (1-5): The table chart given below shows the number of students who appeared for High-school exam from the Gurgaon district over years 2016, 2017, 2018, and 2019 and percentage of passed and number of failed students. Some data is missing. Study the table carefully and answer the questions given below.

Year	Total students appeared In high-school exam	% of passed students	Number of failed students
2016	16000	75%	_____
2017	20000	_____	4500
2018	18000	90%	_____
2019	25000	_____	5500

Note: Total number of appeared students = (Number of passed students + Number of failed students)

- Find the sum of total number of failed students in the year 2018 and total number of passed students in the year 2016.
(a) 13800 (b) 12900 (c) 14200 (d) 13600 (e) 14500
- Total number of passed students in the year 2016 is what percent of total number of failed students in the year 2019 (Approximately).
(a) 225% (b) 218% (c) 200% (d) 250% (e) 238%
- Find the average number of failed students in all the given four years.
(a) 3750 (b) 3800 (c) 3950 (d) 4000 (e) 4150
- Find the difference between total number of passed students in the year 2017 and total number of failed students in the year 2018.
(a) 13500 (b) 13600 (c) 14200 (d) 13700 (e) 14100
- Find the percentage of passed students in the year 2019 out of the total students appeared in exam that year.
(a) 78% (b) 80% (c) 75% (d) 70% (e) 82%

Directions (6-10) :- The given table shows the number of votes cast in a city in given years. Some data is missing. Study the following table and answer the following questions.

Year	Total number of votes	Percentage of valid votes	Respective ratio of valid votes of A and valid votes of B
2013	1000	40%	-
2014	2500	50%	-
2015	800	-	7 : 4
2016	-	75%	8 : 5
2017	-	-	5 : 3

Note: - Total votes = valid votes + invalid votes

Total valid votes = valid votes of A + valid votes of B

- The total number of votes increased by 40% in 2018 with respect to 2015 and out of which only 20% votes are invalid. Find the no. of valid votes in 2018.
(a) 224 (b) 896 (c) 1024 (d) 908 (e) 696
- If the average no. of valid votes in 2014 and 2016 are 1000. Find the total no. of votes cast in 2016.
(a) 1250 (b) 1750 (c) 1000 (d) 750 (e) 1500
- What was the respective ratio of no. of valid votes of A and no. of valid votes of B in year 2014, if the no. of valid votes of B was 650 in the same year?
(a) 12/25 (b) 13/12 (c) 13/25 (d) 12/13 (e) 11/13
- If 55% of total cast votes are valid in year 2015, find the difference between valid votes of A and B in the same year?
(a) 240 (b) 150 (c) 180 (d) 90 (e) 120
- In 2016, the difference between no. of valid votes of A and B was 225. What was the total no. of votes cast in 2016?
(a) 1500 (b) 1300 (c) 1700 (d) 900 (e) 1100

Directions (11-15): Study the table given below & answer the question.

Table given below shows the number of items sold by four different sellers in the five different months.

Seller Month	A	B	C	D
Feb	–	42	52	64
March	48	–	24	74
April	32	28	48	56
May	36	64	–	32
June	54	81	36	–

Note- Some data are missing in the given table, find the missing data if necessary.

11. If seller A sold 150 items in January and February together and number of items sold by seller A in February and March together is 80% of the no. of items sold by same seller in May and June together then find no. of items sold in January by seller A?
(a) 108 (b) 132 (c) 126 (d) 92 (e) 96
12. If the ratio of total items sold by seller B in Feb & March together to total items sold by seller C in April & May together is 1 : 2 and items sold by C in May is 64. Then find total items sold by seller B in March?
(a) 14 (b) 20 (c) 24 (d) 12 (e) 32
13. If average of items sold in April by all sellers is equal to average items sold in March by all sellers, then total items sold by seller B in March is what percent of items sold by seller A in May?
(a) 40% (b) 50% (c) 70% (d) 75% (e) 60%
14. If no. of items sold by seller D in June is 50% more than no. of items sold by seller B in May then find the difference of total items sold by seller D in May & June together and total items sold by seller A in March & April together?
(a) 58 (b) 32 (c) 36 (d) 42 (e) 48
15. Find the ratio of items sold by seller B in Feb & June together to items sold by seller C in May & June together if items sold by seller C in May is $33\frac{1}{3}\%$ of items sold by seller B in June?
(a) 47 : 23 (b) 41 : 23 (c) 43 : 21 (d) 41 : 21 (e) 31 : 21

Direction (16–20) : Given below table shows number of Bank PO preliminary exams appeared by six candidates and number of exams cleared by these candidates. Some data is missing. Read the data carefully and answer the questions.

Candidates	Number of Bank PO preliminary exams appeared	Number of exams cleared
Ayush	24	–
Veer	–	12
Harsh	35	–
Adarsh	48	18
Sumit	–	20
Sandeep	18	–

16. If number of exams appeared by Veer is 20% more than that of Harsh appeared, then find percentage of exam cleared by Veer?
(a) $28\frac{4}{7}\%$ (b) $22\frac{4}{7}\%$ (c) $18\frac{4}{7}\%$ (d) $16\frac{4}{7}\%$ (e) 10%
17. Total number of exams in which Sumit appeared is 10% more than that of Veer appeared. If Sumit appeared in four less exams than Adarsh, then find number of exams, which Veer did not clear?
(a) 24 (b) 32 (c) 36 (d) 44 (e) 28
18. If percentage of exams cleared by Ayush is $41\frac{2}{3}\%$, then find exams which Ayush did not clear are what percent of total exams in which Harsh appeared?
(a) 35% (b) 44% (c) 48% (d) 40% (e) 50%

19. If number of exams in which Sumit appeared is equal to 12 more than average number of exams in which Ayush & Adarsh appeared, then find ratio of exams which Sumit did not clear to exams which Adarsh did not clear?
 (a) 14 : 17 (b) 14 : 15 (c) 13 : 15 (d) 3 : 5 (e) 4 : 5
20. Total number of exams in which Sumit appeared is 37.5% more than that of Ayush appeared, while total number of exams in which Veer appeared is 20% more than that of Harsh appeared. If Sandeep cleared 50% of appeared exams, then find exams cleared by Sandeep is what percent of total exams in which all six appeared?
 (a) 3.5% (b) 4.5% (c) 2.5% (d) 1.5% (e) 5%

Directions (21 – 25): The following table shows the total no. students and percentage of students present on a particular day out of them for two schools A and B in different classes.

Classes	School A	Student present (in %)	School B	Student present (in %)
VI	450	32%	—	44%
VII	260	45%	250	24%
VIII	—	38%	—	60%
IX	560	—	792	25%
X	220	35%	350	—

21. If total number of students in class VIII in both the school together are 1625, while total students present in both the classes together are 766, then find difference between number of students in class VIII in both the schools?
 (a) 250 (b) 275 (c) 225 (d) 300 (e) None of these
22. The number of students present in class VI in school A are approximately what percent of number of students present in class IX in school B?
 (a) 65% (b) 70% (c) 75% (d) 73% (e) 80%
23. If number of students present in class VI in school B are 2 less than double of the number of students presents in same class in school A, then find the total number of students in class VI in school B.
 (a) 625 (b) 650 (c) 600 (d) 700 (e) None of these
24. If no. of students present in class XI in school B are $14\frac{2}{7}\%$ less than number of students present in class X in the same school, while total students in class XI in school B is 400, then what percent of students in class XI in school B are present on that day?
 (a) 25.5% (b) 26.5% (c) 27.5% (d) data inadequate (e) None of these
25. Find the total number of students present in class VII in both the schools together?
 (a) 157 (b) 187 (c) 167 (d) 177 (e) None of these

Practice MCQs for Prelims (Solutions)

1. **(a):** Required sum = $18000 \times \frac{100-90}{100} + 16000 \times \frac{75}{100}$
 $= 1800 + 12000 = 13800$
2. **(b):** Required % = $\frac{16000 \times \frac{75}{100}}{5500} \times 100$
 $= \frac{12000}{5500} \times 100 \approx 218\%$
3. **(c):** Required average = $\frac{1}{4} \times (16000 \times \frac{(100-75)}{100} + 4500 + 18000 \times \frac{(100-90)}{100} + 5500)$
 $= \frac{1}{4} \times (4000 + 4500 + 1800 + 5500) = 3950$
4. **(d):** Required difference = $(20000-4500) - 18000 \times \frac{100-90}{100} = (15500 - 1800) = 13700$

5. **(a):** Required percentage
 $= (25000-5500) \times \frac{100}{25000} = 78\%$
6. **(b):** Required no. = $800 \times \frac{140}{100} \times \frac{80}{100} = 896$
7. **(c):** Let total no. of votes cast in 2016 be x.
 ATQ
 $\frac{\frac{50}{100} \times 2500 + \frac{75}{100} \times x}{2} = 1000$
 $\frac{1250 + \frac{3}{4}x}{2} = 1000$
 $\frac{3}{4}x = 2000 - 1250$
 $x = 1000$

8. (d): Total no. of valid votes in year 2014 = $\frac{50}{100} \times 2500 = 1250$
 No. of valid votes of A in 2014 = $1250 - 650 = 600$
 So, required ratio = $\frac{600}{650} = \frac{12}{13}$

9. (e): Total valid votes of year 2015 = $\frac{55}{100} \times 800 = 440$
 Let valid votes of A and B are $7x$ and $4x$ respectively.
 $7x + 4x = 440$
 $11x = 440$
 $x = 40$
 So, required difference = $7x - 4x = 3x = 3 \times 40 = 120$

10. (b): Let no. of valid votes of A and B are $8x$ and $5x$ respectively.
 So, $8x - 5x = 3x = 225$
 So, total no. of valid votes = $13x = 975$
 Total no. of votes cast in 2016
 $= 975 \times \frac{100}{75} = 1300$

11. (c): Let no. of items sold by A in Feb be x
 $(x + 48) = \frac{80}{100} \times (36 + 54)$
 $x = 72 - 48 = 24$
 Items sold by A in Jan = $150 - 24 = 126$

12. (a): Let total items sold by B in March be ' x '
 Item sold by C in May = 64
 Atq,
 $\frac{42+x}{48+64} = \frac{1}{2}$
 $84 + 2x = 112$
 $x = \frac{28}{2} = 14$

13. (b): Average of item sold in April is equal to average of item sold in March by all sellers. So, total item sold in March is equal to total item sold in April
 Total items sold by all sellers in March = $32 + 28 + 48 + 56 = 164$
 No. of item sold by seller B in March = $164 - 48 - 24 - 74 = 18$
 Required percentage = $\frac{18}{36} \times 100 = 50\%$

14. (e): Average items sold by seller D in June
 $= 64 \times \frac{150}{100} = 96$
 Required difference = $(96 + 32) - (48 + 32)$
 $= 128 - 80 = 48$

15. (d): Items sold by seller C in May
 $= 81 \times \frac{1}{3} = 27$
 Required ratio = $\frac{42+81}{27+36} = \frac{123}{63}$
 $= 41 : 21$

16. (a): Number of exams appeared by Veer
 $= 35 \times \frac{120}{100} = 42$
 Required percentage = $\frac{12}{42} \times 100$
 $= 28\frac{4}{7}\%$

17. (e): Let total number of exams in which Veer appeared = $10x$
 So, total exams in which Sumit appeared = $11x$
 ATQ –
 $11x + 4 = 48$
 $x = 4$
 So, number of exams, which Veer did not clear
 $= 10 \times 4 - 12 = 28$

18. (d): Exams in which Ayush did not clear
 $= 24 \times \left(100 - \frac{125}{3}\right) \times \frac{1}{100} = 14$
 Required percentage = $\frac{14}{35} \times 100 = 40\%$

19. (b): Number of exams in which Sumit appeared = $\frac{24+48}{2} + 12 = 48$
 Exams which Sumit did not clear = $48 - 20 = 28$
 Exams which Adarsh did not clear = $48 - 18 = 30$
 Required ratio = $\frac{28}{30} = 14 : 15$

20. (b): Total number of exams in which Sumit appeared
 $= 24 \times \frac{11}{8} = 33$
 Total number of exams in which Veer appeared
 $= 35 \times \frac{120}{100} = 42$
 Total exams in which all six appeared
 $= 24 + 42 + 35 + 48 + 33 + 18 = 200$
 Number of exams cleared by Sandeep
 $= 18 \times \frac{50}{100} = 9$
 Required percentage = $\frac{9}{200} \times 100 = 4.5\%$

21. (b): $x \times 0.38 + (1625 - x) \times 0.60 = 766$
 $x = 950$
 $1625 - x = 675$
 required difference = $950 - 675 = 275$

22. (d): Required percentage = $\frac{144}{198} \times 100 \approx 73\%$

23. (b): number of students present in class VI in school B
 $= 2 \times \left[450 \times \frac{32}{100}\right] - 2 = 286$
 the total number of students in class VI in school B
 $= 286 \times \frac{100}{44} = 650$

24. (d): Since data is not sufficient to calculate the required value.

25. (d): $260 \times \frac{45}{100} + 250 \times \frac{24}{100} = 177$

Practice MCQs for Mains

Direction (1-5): Study the table given below and answer the given questions.

Table shows data related to number of applicants who applied for home loan and eligible applicants in 2019 from states X, Y and Z.

[NOTE: Total applicants = Total eligible applicants + Total non-eligible applicants]

States	Total applicants	% of eligible applicants	Ratio of males to females found eligible for loan
X	500	40%	11 : 9
Y	-	50%	-
Z	400	-	1 : 2

NOTE: Some values are missing. You have to calculate these values as per data given in the questions.

- What is the average number of eligible applicants from states X and Z, if % of eligible applicants from states Y and Z is same?
(a) 200 (b) 180 (c) 450 (d) 225 (e) 205
- How many males are found eligible for home loan from state X?
(a) 90 (b) 225 (c) 110 (d) 275 (e) 200
- Find the number of eligible male applicants from state Y, if total applicants in state Y are twice of that of in state Z and ratio of males to females who are eligible for loan in state Y is 29 : 11.
(a) 55 (b) 110 (c) 290 (d) 220 (e) 132
- What is the ratio of non-eligible applicants from state X to that of in state Z, if there are 30% eligible applicants from state Z?
(a) 5 : 4 (b) 5 : 2 (c) 5 : 3 (d) 3 : 4 (e) 15 : 14
- If there are 100 males and 50 females from state Y who are eligible for home loan. Find total applicants from state Y.
(a) 150 (b) 200 (c) 250 (d) 300 (e) 350

Directions (6-10): Given below table shows total manufactured bikes by two company Honda and Hero in five months of 2006 and sold bike percentage of two bikes out of total manufactured bikes. Some data are missing in table, calculate according to given information and answer the questions given below:

Months	Honda		Hero	
	Manufactured	sold %	Manufactured	sold %
January	4500	60%	—	30%
February	6000	43%	—	45%
March	—	60%	2800	60%
April	4800	70%	5500	50%
May	3800	—	4000	—

- Out of the number of sold bikes of Honda in March the ratio of Shine and Honda CBR is 1 : 7. If the Honda CBR sold in March is 1260, then what is the number of total manufactured bikes (Honda Shine & Honda CBR) in March (Note- Honda manufactured only two type of bikes in March) ?
(a) 1440 (b) 2360 (c) 2400 (d) 2500 (e) 2800
- The number of manufactured bikes of Hero increased by 100% from January to February and total number of sold bikes of Hero in months January & February together is 4080. Then number of total Hero bikes manufactured in January is what percent of total number of Hero bikes manufactured from January to May together ?
(a) $15\frac{1}{9}\%$ (b) $14\frac{1}{9}\%$ (c) $13\frac{1}{9}\%$ (d) $12\frac{1}{9}\%$ (e) $11\frac{1}{9}\%$
- If 65% Honda bikes sold and 35% Hero bikes sold in month of May, then find the difference between Honda bikes sold in month of April & May together and Hero bikes sold in same month together ?
(a) 1610 (b) 1620 (c) 1640 (d) 1680 (e) 1608

9. If total manufacturing of Honda bikes in January 2006 increased by 25% as compared to previous month of 2005 and the percentage of sold Honda bikes in January 2006 increased by 20% as compared to previous month of 2005, then find the ratio of sold Honda bikes in December 2005 to the total manufactured bikes of Honda in January 2006.
(a) 2:1 (b) 1:2 (c) 1:3 (d) 1:4 (e) 1:5
10. Sold Honda bikes in January and February together is approximate what percent more than sold Hero bikes in March and April together?
(a) 12% (b) 15% (c) 19% (d) 22% (e) 24%

Directions (11-15): Refer to the table given below and answer the given questions.

Table shows the 5 villages and total population and percentage of males, females and transgenders in each village in year 2000. Some data are missing, find the missing data to answer the given questions.

Village	Total Population	Percentage of Males	Percentage of Females	Percentage of Transgenders
P	2400	25%	-	-
Q	-	-	40%	20%
R	-	50%	20%	-
S	800	-	-	16%
T	-	-	24%	36%

11. If the ratio of population of females and transgenders in village P in year 2000 is 3 : 7. And females in village P in year 2001 is increased by 20% from that of year 2000. Then find the total number of males and transgenders in village P in year 2001 so that overall population in year 2001 is same as in year 2000?
(a) 1752 (b) 1852 (c) 2752 (d) 3200 (e) None of these
12. If number of transgenders in village R in year 2000 is 180. And ratio of males and females in village S in year 2000 is 1:2. Then find the difference of males in village R and village S?
(a) 96 (b) 86 (c) 76 (d) 55 (e) None of these
13. If total population of village Q and village R together in year 2000 is 25% more than the total population of village P in year 2000. And ratio of total population of village Q and village R in year 2000 is 2 : 3. Then find the ratio of males in village Q to transgenders in village R in year 2000?
(a) 9 : 8 (b) 8 : 9 (c) 2 : 3 (d) 3 : 5 (e) None of these
14. If ratio of males of village S in year 2000 to the females in village P in year 2000 is 2 : 5 and population of transgenders in village P is increased by 20% in year 2001 from year 2000. Then find the total population of transgenders in year 2001 in village P?
(a) 2000 (b) 1200 (c) 1500' (d) Cannot be determined (e) None of these
15. If ratio of total population of village R to village T in year 2000 is 5: 4. Then number of males in village T in year 2000 is approximately what percent more or less than the number of transgenders in village R in year 2000?
(a) 5.667% (b) 12% (c) 10% (d) 3.334% (e) 6.667%

Directions (16-20): The given table shows the number of solo performances performed by four different artists (Arti, Bindu, Chiru and Dev) in a particular TV shows on different days in a week and amount paid to them for each performance.

Artists	Number of performances each on Monday, Wednesday & Friday (Case 1)	Number of performances each on Tuesday, Thursday & Saturday (Case 2)	Amount paid for an hour of performance (In Rs)
Arti	1	1	18000
Bindu	--	--	10000
Chiru	1	2	12000
Dev	--	2	16000

Note:

- (i) There is no performance on Sunday.
 (ii) '—' is missing value
 (iii) Each performance is of half an hour.
 (iv) Duration of the show is three weeks.

- 16.** Find the ratio of amount paid to Arti to the amount paid to Chiru for their performances in the shows?
 (a) 4: 5 (b) 3: 2 (c) 1: 2 (d) 9: 10 (e) None of the above
- 17.** Find number of performances made by Bindu in a week if she is paid an amount of Rs. 2.25 lakh for her performances in the entire show.
 (a) 15 (b) 18 (c) 12 (d) 21 (e) 24
- 18.** Number of performances made by Dev in a week is 3 more than the number of performances made by Chiru in that week. Then find the total amount paid to Dev for the entire show?
 (a) Rs. 2.82 lakh (b) Rs. 2.88 lakh (c) Rs. 2.58 lakh (d) Rs. 2.70 lakh (e) Rs. 2.67 lakh
- 19.** Total amount paid to Chiru for the entire show is what percent more or less than total amount paid to Arti and Dev for their performances in case 2 in entire show?
 (a) 25% (b) 30% (c) 24% (d) 28% (e) 27.5%
- 20.** If Bindu did not perform under case 2 in the entire show then find the total amount paid to remaining artists under case 2 in the entire show?
 (a) 3.15 lakh (b) 3.27 lakh (c) 3.12 lakh (d) 3.24 lakh (e) 3.33 lakh

Direction (21 -25) : A quiz competition was conducted by 'ADDA 247' and four boys, Mohit, Ankit, Veer & Ayush participated in this quiz. Read the data carefully and answer the question.

Total questions in quiz = 40

Marks for each right answer = +2

If someone left more than 6 questions, then only 4 marks will be deducted.

Note – 1 mark deducted on the answer of four wrong answers and Ayush got highest marks in competition.

Participants	Right questions	Wrong questions	Obtained marks
Mohit	26	-----	46.25
Ankit	-----	-----	58.5
Veer	-----	-----	65
Ayush	-----	-----	----

- 21.** Find the number of questions left by Mohit ?
 (a) 5 (b) 3 (c) 7 (d) 8 (e) 9
- 22.** If Ankit did not attempt all questions, then find total number of questions attempted by Ankit?
 (a) 34 (b) 38 (c) 33 (d) 36 (e) 35
- 23.** Find percentage of questions left by Veer?
 (a) 5.5% (b) 4.5% (c) 3.5% (d) 2.5% (e) 7.5%
- 24.** If Ayush did not attempt all questions and the total marks got by him is a multiple of 3 & 23, then find total number of questions answer rightly by Ayush?
 (a) 35 (b) 32 (c) 36 (d) 37 (e) 34
- 25.** Divyaraj (another person) attempt four questions more than Mohit and marks obtained by Divyaraj is an even number. If all questions answered by Divyaraj are not right, then find total maximum possible marks scored by Divyaraj for the same quiz?
 (a) 56 (b) 58 (c) 54 (d) 60 (e) 62

Directions (26-30): Following are the details of employees of 4 companies using different application: (in percentage distribution)

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Company	Total	Paytm	Phone Pay	Google Pay
A	500	40%	35%	–
B	650	–	48%	32%
C	800	25%	–	35%
D	750	30%	–	–

Note: In company A, no. of users using google pay and users using no application is 2 : 3

→ In Company B, number of users using paytm and users using no application is 10 : 3.

→ In company C, number of users using phone Pay and users using no application is in ratio 3 : 1.

→ In company D, users using phone Pay, Google Pay and users using no application is 2 : 3 : 2.

26. Google pay users in company B and C is approximately what % more than paytm users in companies A and B together?

- (a) 68% (b) 63% (c) 58% (d) 70% (e) 55%

27. Find the difference of total number of phone pay users in all companies to total number of google pay users in all companies together?

- (a) 105 (b) 114 (c) 110 (d) 120 (e) 124

28. Find the ratio of paytm and phone pay users of company C together to the phone pay and google pay users together of company A ?

- (a) 88 : 49 (b) 88 : 45 (c) 86 : 41 (d) 80 : 45 (e) 76 : 40

29. Find the total number of employees using phone pay and employees using no application together?

- (a) 1200 (b) 1175 (c) 1250 (d) 1230 (e) 1212

30. Total number of google pay users is how much more/less than total of paytm users?

- (a) 38 (b) 50 (c) 48 (d) 42 (e) 55

Direction (31 – 36): Table given below shows five colleges in which there are five departments viz - Arts, commerce, Medical, science and vocational. Also, table tells shows total received application in department and percentage of cancel applications (Male + female) and ratio of male to female in approved application.

Departments	Total Application received	Percentage of cancel applications	Ratio of (male: female) Approved
Arts	P	40%	11 : 7
commerce	1400	Q	29:21
Medical	1600	35%	R
Science	S	55%	43:17
vocational	800	60%	T

31. If the difference between approved male applications and approved female applications in Arts department is 200, then find P is how what percent more than applications received in vocational department?

- (a) 75% (b) 87.5% (c) 62.5% (d) $66\frac{2}{3}\%$ (e) 50%

32. If the difference between approved male applications and approved female applications in science department is 234, then find the sum of total applications received in science, commerce and medical department together?

- (a) 4200 (b) 4400 (c) 4600 (d) 3800 (e) 5200

33. If the difference between approved male applications and approved female applications in Arts department is 100, then find difference between P and cancel application in medical department?

- (a) 170 (b) 180 (c) 190 (d) 165 (e) 175

34. If the number of approved male applications in vocational department is 40 more than that of approved female applications, then find the ratio of approved female applications to approved male applications in the same department?
 (a) 9 : 7 (b) 5 : 7 (c) 13 : 9 (d) 7 : 9 (e) 7 : 11
35. find the ratio of canceled application in medical department to vocational department?
 (a) 7 : 5 (b) 5 : 7 (c) 13 : 9 (d) 9 : 7 (e) 7 : 6
36. If the difference between approved male applications and approved female applications in commerce department is 112, then find sum of Q and total application received in medical department?
 (a) 2300 (b) 2400 (c) 2700 (d) 2800 (e) 3200

Direction (37 – 41): Given table shows the number of applications filled for three various exams (CAT, MAT & SAT) and applicants who attempted these exams in years 2018, 2019 & 2020. Read the data carefully and answer the questions. (Some data are missing which you have to calculate as per information provided in question).

Years	CAT		MAT		SAT	
	Filled	Attempted	Filled	Attempted	Filled	Attempted
2018	2000	---	1600	1200	---	800
2019	2400	2200	---	1000	1400	---
2020	---	2400	2000	1800	1800	1600

(exam & year is in format i.e. CAT 2018 is written as CAT'18)

(Each applicant filled only one form and there are only these 3 exams)

Note – Total applicants who filled the form of any exam in any year = Total applicants (who attempted + who have not attempted) that exam in that year.

37. In year 2018, only 3600 applicants attempted all three exams together and applicants who filled MAT'19 are 25% less than those who attempted CAT'18, then what percent of applicants attempted MAT in all given years together?
 (a) $77\frac{1}{3}\%$ (b) $93\frac{1}{3}\%$ (c) 120% (d) $83\frac{1}{3}\%$ (e) $88\frac{1}{3}\%$
38. Ratio of applicants who filled CAT'20 to those who attempted SAT'19 is 7 : 3 and number of applicants who attempted SAT'19 is equal to number of applicants who filled SAT'18. If 4400 applicants filled SAT in all given years together, then find how many applicants not attempted any exam in 2020?
 (a) 400 (b) 1200 (c) 800 (d) 1000 (e) 600
39. Average number of applicants who filled CAT in all given years is $\frac{8000}{3}$ and percentage of applicants attempted CAT'20 out of total who filled CAT'20 is same as that for MAT'19, then in which year maximum percent of applicants attempted MAT?
 (a) 2018 & 2019 (b) 2019 (c) 2019 & 2020 (d) 2018 (e) 2020
40. Difference between number of applicants who filled MAT and those who attempted same exam is maximum in 2018 and minimum in 2020. If number of applicants who filled MAT'19 is equal to number of applicants who attempted SAT'19, then what can be the possible ratio of applicants who attempted SAT'19 to those who attempted SAT'20?
 (a) 1 : 1 (b) 4 : 5 (c) 21 : 20 (d) 3 : 4 (e) 7 : 8
41. How many applicants filled CAT'20?
 I. no. of applicants who attempted CAT'18 is same as no. of applicants who filled MAT'19.
 II. no. of applicants who did not attempt CAT in all given years together is equal to no. of applicants who did not attempt MAT in all given years together.
 (a) Both statements together are necessary
 (b) Either statement I alone or II alone is sufficient
 (c) Only statement I alone is sufficient
 (d) Both statements together are not sufficient
 (e) Only statement II alone is sufficient

Direction (42 –47): Study the following data carefully and answer the following questions.

Five friends – Aman, Bobby, Chris, David and Emmy played different games i.e., Chess, Pubg and Poker and got different score. The table given below shows the total scores got in three games by each of them, and percentage of chess score out of total score. Also shows the ratio of scores between Pubg and Poker and difference between chess score and poker score. Some data (A, B, C, D and E) are missing you are supposed to find it and answered accordingly.

Note - Chess Scores obtained by each Student is more than poker score obtained by him.

Friends	Total score	% of chess score	Ratio between pubg score and poker score	Difference between chess and poker score
Aman	500	A	5:1	80
Boby	B	30%	5:2	70
Chris	600	35%	C: 6	30
David	D	45%	13:9	90
Emmy	800	40%	7: E	120

42. What is the difference between total Scores obtained by Bobby and David?
 (a) 300 (b) 400 (c) 250 (d) 275 (e) None of these
43. If the ratio of score obtained by Aman in chess and golf is 28 : 13 respectively. then find score obtained by Aman in golf?
 (a) 104 (b) 91 (c) 52 (d) 78 (e) 65
44. Find the ratio of score obtained by Bobby and David in chess respectively?
 (a) 5: 8 (b) 6: 7 (c) 7: 6 (d) 8: 5 (e) 9 :10
45. Find the difference between score obtained by Chris in Pubg and score obtained by Emmy in Poker?
 (a) 14 (b) 16 (c) 17 (d) 10 (e) 20
46. Find the average of total score obtained by all the five friends?
 (a) 800 (b) 600 (c) 900 (d) 1000 (e) 700
47. Total score obtained by Chris is what percent more or less than that of by Emmy?
 (a) 24% (b) 25% (c) 30% (d) 22% (e) 20%

Direction (48–51) : Table given below shows total number of goals scored by five players in four different leagues and in each column two data are missing. Read the data carefully and answer the questions given below.

Note – Two missing value are least values and these two missing values will be either equal or less than to 10% of total goals scored by these five players in each of four leagues.

Players	La Liga	Bundesliga	UEFA	ISL
Messi	—	200	—	106
Ronaldo	176	130	—	104
Neymar	—	—	220	—
Luka	144	150	40	112
Rodriguez	120	—	156	—
Total	540	600	480	400

48. What is maximum approximate percentage of goals scored by Messi in all the four leagues?
 (a) 15.75% (b) 21.75% (c) 23.75% (d) 19.75% (e) 25.75%
49. If absolute difference between total goals scored by Messi and Neymar in all four leagues is minimum except zero, then find the ratio of total goals scored by Neymar and Messi in all four leagues (Messi scored more goals in La Liga than Neymar)?
 (a) 41 : 44 (b) 41 : 46 (c) 41 : 48 (d) 41 : 50 (e) None of these
50. What will be the difference between maximum possible goals scored by Rodriguez in all four leagues and minimum possible goals scored by Messi in all four leagues?
 (a) 2 (b) 3 (c) 1 (d) 0 (e) 4

51. Total minimum possible goals scored by Neymar in all the four leagues is how much less than total maximum possible goals scored by Ronaldo in all the four leagues?

- (a) 105 (b) 85 (c) 100 (d) 75 (e) 95

Direction (52 – 54): Table given below shows the number of one run, two run, three run, four run and six run hit by three different Indian players (Kohli, Dhoni & Rohit) in their IPL career. Some value in the table is missing which you must find according to given information below table.

Type of runs	Kohli	Dhoni	Rohit
one runs	3000	—	1500
two runs	—	2400	—
three runs	1500	—	1200
four runs	—	400	—
six runs	240	—	160

Note - A batsman can score runs in these five manners only.

Number of runs scored by Kohli with two runs is 75% of number of runs scored by Rohit with three and total number of runs scored by all three players by three is 11100. Total runs scored by Dhoni with one run is 20% more than average number of runs scored by Virat & Rohit with one run. Total number of four run hit by Rohit is 50% more than that of by Kohli and total number of runs score by Dhoni by six is 67.5% of total number of runs scored by Kohli by four runs. Total runs scored by Dhoni with six runs is 45% of total runs scored by same player with three runs and total runs scored by Rohit with six runs is 64% of total runs scored by same player with two runs.

$$\text{Batting Average} = \frac{\text{Total runs scored}}{(\text{Total innings} - \text{Total not out})}$$

$$\text{Strike rate} = \frac{\text{Total runs scored}}{\text{Total ball faced}} \times 100$$

$$\text{Total balls faced} = \text{Total dot balls} + \text{Total scoring balls}$$

52. 17.625 % of total balls faced by Kohli are dot balls and strike rate of Kohli and Rohit is 'V' and 'R' respectively. If Rohit faced 4000 balls more than Kohli, then find the difference between V & R?

- (a) 90.5 (b) 88.5 (c) 80.5 (d) 82.5 (e) 84.5

53. Total number of matches played by Kohli and Dhoni is 225 and 450 respectively and ratio of total number of match in which Kohli and Dhoni remain not out is 1 : 2. If average of Kohli is 34.575 runs more than that of Dhoni, then find percentage of getting not out for kohli?

- (a) $11\frac{1}{9}\%$ (b) $14\frac{2}{7}\%$ (c) $16\frac{2}{3}\%$ (d) $18\frac{1}{3}\%$ (e) $9\frac{1}{11}\%$

54. Total dot balls faced by Rohit is 3640 and strike rate of Dhoni is 2.5(in numeric value) more than Rohit and average number of balls faced per innings by Dhoni is 50 and out of total innings he played, he remained not out in 40 innings. If batting average of Dhoni is 18.0625 more than Rohit and Rohit remained not out in 50 innings, then find total number of dot balls played by Dhoni is how much more than total innings played by Rohit?

- (a) 3065 (b) 3265 (c) 3055 (d) 3075 (e) 3175

Directions (55-58): Given below the table shows, total number of SBI branches in six cities, total number of accounts in these branches and ratio between saving and current accounts in each branch. Some data are missing, which have to calculate according to given data in questions. Read table carefully and answer the questions given below:

Cities	Total branches	Total number of bank accounts open in all branches	Ratio between Saving accounts: Current accounts
P	—	—	11 : 4
Q	128	44800	—
R	—	38400	2 : 1
S	72	—	—
T	—	23800	—
U	112	—	5 : 2

(Note: (1) Number of accounts opened in each branches are equal in each cities

(2) All branches opened only two types of accounts saving and Current.

55. If $\frac{5}{18}$ th of total current accounts opened in city P are 10000 and average number of accounts opened in each branch is 900 then total branches in city P are what percent more or less than total branches in city R. Given that average number accounts opened in each branches in city R is 400 ?
 (a) 48.25% (b) 66.25% (c) 46.25% (d) 56.25 % (e) 36.25%
56. $\frac{13}{25}$ th of total current accounts opened in city U are used for daily transaction and remaining used occasionally. If difference between current accounts used for daily transaction and current account used occasionally is 320 then ratio between average number of accounts opened in each branches in city U to number of branches in city R. (Given that average number of account opened in each branches of city R is 400)
 (a) 48 : 125 (b) 127 : 48 (c) 125 : 48 (d) 121 : 48 (e) None of these
57. If in city T all branches charged Rs.12.5 and Rs.7.5 for opening one saving account and one current account respectively and total amount generated in opening account from all branches in city T is Rs.262500 then find difference between total number of currents accounts and saving accounts opened in city T ?
 (a) 8800 (b) 9800 (c) 7800 (d) 6800 (e) 5800
58. In city Q ratio between total opened saving account to total opened current accounts is 5 : 2 and in city S average number of accounts opened in each branches is 550. Find average of total saving accounts opened in city Q and S, if in city S ratio between total saving accounts to current accounts in each branches is 7 : 4. ?
 (a) 28600 (b) 26800 (c) 28400 (d) 28200 (e) 24800

Directions (59-62) : Table given below shows the Revenue generated by six online stores, and percentage distribution of revenue generated by five different section in these stores. Some data are missing, calculate the missing data according to given information and answer the following questions: -

Online stores Total Revenue (million)		Percentage distribution of revenue generate by each section				
		Clothing Section	Footwear Section	Home & Living Section	Cosmetic Section	Electronic Section
Myntra	65	30	-	17.5	-	5
Ajio	-	-	15	20	-	12.5
Jabong	45	10	25	-	5	15
Snapdeal	-	25	-	-	10	35
Flipkart	75	40	5	-	7.5	35
Amazon	55	20	12.5	-	10	45

59. Revenue generated by home and living section of Ajio is 8 million, then find revenue generated by clothing and cosmetic section together by Ajio is what percent of revenue generated by home and living section of Jabong? (in approximate)
 (a) 116% (b) 104% (c) 112% (d) 128% (e) 132%
60. If ratio between revenue generated by footwear section to cosmetic section of Myntra is 10 : 9. Then find the ratio between revenue generated by footwear section of Myntra to revenue generated by home & living section of Flipkart?
 (a) 27 : 19 (b) 15 : 26 (c) 26 : 15 (d) 19 : 27 (e) 26 : 11
61. If revenue generated by Electronic section of Ajio is 5 million, then find the difference between revenue generated by cosmetic and clothing section of Ajio and cosmetic and Home & living section of Flipkart? (in million)
 (a) 6 (b) 8 (c) 12 (d) 4 (e) 10
62. If total revenue generated by clothing section of Snapdeal is 12.5 million and total revenue generated by Footwear section of Ajio is 6 million. Find total revenue generated by all section of Snapdeal is what percent more/less than total revenue generated by all sections of Ajio?
 (a) 40% (b) 15% (c) 30% (d) 20% (e) 25%

Direction (63-65): Table given below shows five different mobile phones sold in Amazon sale, percentage of total 32 GB mobile phone sold, percentage of total 64 GB sold mobile which returned out of total sold 64 GB mobile phone, also total returned mobile phone out of total sold mobile Phones. Read data carefully and answer the questions:

Mobile Sets	Total sold mobiles	% of total sold 32 GB mobiles	% of total 64 GB sold mobile which return out of total sold 64 GB mobiles	% of total return mobile out of total sold mobile
'A'	—	35%	10%	14%
'B'	12750	—	20%	—
'C'	—	—	25%	24%
'D'	8750	32%	—	22%
'E'	—	35%	10%	—

63. If total returned mobile phone of 'A' is 560 and total 64 GB returned mobile phone of 'D' is 225% more than total 64 GB returned mobile phone of 'A'. Find total 32 GB returned mobile phone of 'A' is what percent of total 32 GB returned mobile phone of 'D'?
- (a) $23\frac{8}{9}\%$ (b) $25\frac{5}{9}\%$ (c) $26\frac{2}{3}\%$ (d) $27\frac{7}{9}\%$ (e) $28\frac{2}{9}\%$
64. Ratio between total returned mobile Phone of 'B' to total returned 'D' is 8 : 7. If total number of 32 GB sold mobile of 'B' is 1950 more than total number of total 32 GB sold mobile of 'D' and total 64 GB returned mobile of 'D' is 600 less than that of 'B'. Find difference between total 64GB returned mobile phone of 'D' and total sold 32 GB mobile phone sold of 'D'?
- (a) 1800 (b) 1600 (c) 1400 (d) 1200 (e) 1000
65. Total number of phone 'A' & 'E' sold is 8800. If total phone 'E' sold is 20% more than total phone 'A' sold and out of total sold 'E' phones 15% phone returned. Find ratio between total returned 32 GB mobile phone of 'E' to total returned 64 GB mobile phone of 'A'?
- (a) 8 : 5 (b) 102 : 65 (c) 108 : 65 (d) 100 : 67 (e) 110 : 67

Practice MCQs for Mains (Solutions)

- (a): Applicants eligible from state X = 40% of 500 = 200
Applicants eligible from state Z = 50% of 400 = 200
Required average = $\frac{200+200}{2} = 200$
- (c): Applicants eligible from state X = 40% of 500 = 200
Number of males from state X who are eligible for loan = $\frac{200}{20} \times 11 = 110$
- (c): Total applicants from state Y = $2 \times 400 = 800$
Applicants eligible from state Y = 50% of 800 = 400
Number of eligible male applicants from state Y = $\frac{400}{40} \times 29 = 290$
- (e): Non-eligible applicants from state X = 60% of 500 = 300
Non-eligible applicants from state Z = 70% of 400 = 280
Required ratio = $\frac{300}{280} = 15 : 14$
- (d): Total eligible applicants from state Y = $100 + 50 = 150$
Since 50% applicants are eligible from state Y
So, total applicants = $\frac{150}{50} \times 100 = 300$
- (c): Let's total Honda bikes manufactured in March = $100x$
Total sold Honda bikes in March = $60x$
Total Honda CBR sold in March = $60x \times \frac{7}{8} = 1260$
 $x = \frac{1260 \times 8}{60 \times 7}$
 $x = 24$
Total Honda manufactured in March = $24 \times 100 = 2400$
- (a): Let total Hero bikes manufactured in Jan and Feb will be x and $2x$
ATQ—
 $\frac{30x}{100} + \frac{90x}{100} = 4080$
 $0.3x + 0.9x = 4080$
 $x = \frac{4080}{1.2}$
 $= 3400$

$$\begin{aligned}\text{Required \%} &= \frac{3400}{(3400+3400 \times 2 + 2800 + 5500 + 4000)} \\ &= \frac{3400}{22500} \times 100 = 15\frac{1}{9}\%\end{aligned}$$

8. (d): Total Honda bikes sold in month of May & April together

$$\begin{aligned}&= 3800 \times \frac{65}{100} + 4800 \times \frac{70}{100} \\ &= 2470 + 3360 = 5830\end{aligned}$$

Total Hero bikes sold in month of May & April together

$$\begin{aligned}&= 4000 \times \frac{35}{100} + 5500 \times \frac{50}{100} \\ &= 1400 + 2750 \\ &= 4150\end{aligned}$$

$$\text{Required difference} = 5830 - 4150 = 1680$$

9. (b): Total Honda bikes manufactured in December 2005

$$\begin{aligned}&= 4500 \times \frac{100}{125} \\ &= 3600\end{aligned}$$

Total Honda bikes sold in December 2005

$$\begin{aligned}&= 4500 \times \frac{60}{100} \times \frac{100}{120} \\ &= 2250\end{aligned}$$

$$\text{Required ratio} = \frac{2250}{4500} = 1 : 2$$

10. (c): Total sold Honda bikes in Jan and Feb

$$\begin{aligned}&= 4500 \times \frac{60}{100} + 6000 \times \frac{43}{100} \\ &= 2700 + 2580 \\ &= 5280\end{aligned}$$

Total sold Hero bikes in March and April

$$\begin{aligned}&= 2800 \times \frac{60}{100} + 5500 \times \frac{50}{100} \\ &= 1680 + 2750 \\ &= 4430\end{aligned}$$

$$\begin{aligned}\text{Required \%} &= \frac{5280 - 4430}{4430} \times 100 \\ &= \frac{850}{4430} \times 100 = 19.18 \approx 19\%\end{aligned}$$

11. (a): Total population of females and transgenders in village P in 2000 = 75% of 2400 = 1800

∴ Number of females in village P in 2000

$$= \frac{3}{10} \times 1800 = 540$$

$$\text{Females in 2001 in village P} = 540 \times \frac{120}{100} = 648$$

$$\begin{aligned}\therefore \text{Total males \& transgenders in 2001 in village P} \\ &= 2400 - 648 = 1752\end{aligned}$$

12. (c): Percentage transgenders in village R in year 2000 = 30%

$$\begin{aligned}\therefore \text{Total population of village R in 2000} &= \frac{180}{30} \times 100 = 600\end{aligned}$$

$$\therefore \text{males in village R in 2000} = 600 \times 50\% = 300$$

$$\text{Males in village S in 2000} = \frac{84}{100} \times 800 \times \frac{1}{3} = 224$$

$$\therefore \text{Required difference} = 300 - 224 = 76$$

13. (b): Total population of village Q and Village R in 2000

$$= 2400 \times \frac{125}{100} = 3000$$

∴ Total population of village Q in 2000

$$= \frac{2}{5} \times 3000 = 1200 \text{ and}$$

$$\begin{aligned}\text{total population of village R in 2000} &= \frac{3}{5} \times 3000 \\ &= 1800\end{aligned}$$

$$\therefore \text{Required ratio} = \frac{\frac{40}{100} \times 1200}{\frac{30}{100} \times 1800} = \frac{4 \times 2}{3 \times 3} = \frac{8}{9} = 8 : 9$$

14. (d): Cannot be determined

15. (e): Let the population of R = 5x

And the population of T = 4x

$$\text{Required percentage} = \frac{(4x) \times \frac{40}{100} - (5x) \times \frac{30}{100}}{(5x) \times \frac{30}{100}} \times 100$$

$$100 = \frac{(1.6 - 1.5)x}{(1.5)x} \times 100 = \frac{0.1 \times 100}{1.5} = 6.667\%$$

16. (e): Required ratio = $\frac{9 \times 18000}{13.5 \times 12000} = \frac{1}{1} = 1 : 1$

17. (a): Let number of performances made by her in case 1 in a day be x and in case 2 in a day be y.

ATQ

$$\frac{(9x + 9y)}{2} \times 10000 = 225000$$

$$x + y = 5$$

$$\begin{aligned}\text{Required no. of performance in a week} &= 3(x + y) \\ &= 15\end{aligned}$$

18. (b): Let the number of performances made by Dev in a day in case 1 be x

ATQ

$$(3x + 6) - 9 = 3$$

$$x = 2$$

$$\text{Required amount} = 3 \times 12 \times 8000 = \text{Rs. 2.88 lakh}$$

19. (d): Total amount paid to Chiru for the entire show = $\frac{27}{2} \times 12000 = \text{Rs } 1,62,000$

Total amount paid to Arti and Dev for their performances in case 2 in entire show

$$= \frac{9}{2} \times 18000 + 9 \times 16000 = \text{Rs } 2,25,000$$

$$\text{Required \%} = \frac{63,000}{225,000} \times 100 = 28\%$$

20. (e): Required total amount = $4.5 \times 18000 + 9 \times 12000 + 9 \times 16000 = 3.33 \text{ lakh}$

21. (c): For each wrong answer marks deducted = $\frac{1}{4} = 0.25$

Let y number of questions wrongly answerer by Mohit

$$\text{So, } 26 \times 2 - 0.25 \times y = 46.25$$

$$0.25y = 52 - 46.25$$

$$y = 23$$

when 23 questions were wrong, then total no of questions attempt exceeds than total number of questions in quiz.

So, it possible Mohit left more than 6 question from the quiz, so only 4 marks will be deducted

Now, $52 - 4 = 48$

Now number of wrong question attempt by Mohit $\Rightarrow 48 - 0.25y = 46.25$

$$y = 7$$

So, number of questions left by Mohit = $40 - (26 + 7) = 7$

22. (d): For each wrong answer marks deducted = $\frac{1}{4} = 0.25$

Given, total marks obtained by Ankit = 58.5

So, total marks obtained by Ankit indicate that he given right answer of the at least 30 question and he also give wrong answer of even number of questions, but it cannot be multiple of 4, so no of wrong questions should be either 2 or 6.

Let Ankit answered number of right and wrong questions be a & b respectively

$$ATQ, 2a - 0.25b = 58.5$$

Cases - when we start from maximum no of questions attempt

Total attempt	Right attempt(a)	Wrong attempt(b)	Total marks
39	33	6	64.5
39	37	2	73.5
38	32	6	62.5
38	36	2	71.5
37	31	6	60.5
37	35	2	69.5
36	34	2	67.5

So, Only one case follow the total marks obtained by Ankit

Total attempt = 36 (right (a) = 30, wrong(b) = 6)
 $2 \times 30 - 0.25 \times 6 = 58.5$

OR

For each wrong answer marks deducted $= \frac{1}{4} = 0.25$

Given, total marks obtained by Ankit = 58.5

So, total marks obtained by Ankit indicate that he given right answer of the at least 30 question and he also give wrong answer of even number of questions, but it cannot be multiple of 4, so no of wrong questions should be either 2 or 6.

Let Ankit answered number of right and wrong questions be a & b respectively

$$ATQ, 2a - 0.25b = 58.5$$

Cases - when we start from minimum no of right questions attempt

Right que attempt(a)	Wrong question attempt(b)	marks	Total attempt
30	2	$30 \times 2 - 2 \times 0.25 = 59.5$	32
30	6	$30 \times 2 - 6 \times 0.25 = 58.5$	36

So, second condition satisfied obtained marks

Total question attempt = $a + b = 30 + 6 = 36$

23. (e): For each wrong answer marks deducted $= \frac{1}{4} = 0.25$

Given, total marks obtained by Veer = 65

So, total marks of veer indicated that he should be given right answer of at least 33 questions and no of wrongly answered questions should be multiple of 4 (Number of wrong answers can't be 8, because after 33 right answer it not possible to attempt 8 wrong questions, as total no of attempt questions will exceed total no of questions of quiz.)

Let Veer answer number of right and wrong questions be x & y respectively.

$$ATQ, 2x - 0.25y = 65$$

Cases -when we start maximum no of question attempt -

Total attempt	Right attempt(x)	Wrong attempt(y)	Total marks
40	36	4	71
39	35	4	69
38	34	4	67

Only one case follows total marks of Veer,

$$(x + y) = 37, \text{ where } x = 33 \text{ and } y = 4$$

$$(33 \times 2 - 0.25 \times 4) = 65$$

$$\text{Required percentage} = \frac{(40-37)}{40} \times 100 = 7.5\%$$

OR

For each wrong answer marks deducted

$$= \frac{1}{4} = 0.25$$

Given, total marks obtained by Veer = 65

So, total marks of veer indicated that he should be given right answer of at least 33 questions and no of wrongly answered questions should be multiple of 4 (Number of wrong answers can't be 8, because after 33 right answer it not possible to attempt 8 wrong questions, as total no of attempt questions will exceed total no of questions of quiz.)

Let Veer answer number of right and wrong questions be x & y respectively.

$$ATQ, 2x - 0.25y = 65$$

Cases -when we start minimum no of right questions attempt -

Right questions attempt(x)	Wrong questions attempt(y)	Marks obtained	Total attempt
33	4	$33 \times 2 - 4 \times 0.25 = 65$	37

$$(x + y) = 37, \text{ where } x = 33 \text{ and } y = 4$$

$$(33 \times 2 - 0.25 \times 4) = 65$$

$$\text{Required percentage} = \frac{(40-37)}{40} \times 100$$

$$= 7.5\%$$

24. (a): For each wrong answer marks deducted
 $= \frac{1}{4} = 0.25$

Given, Ayush got highest marks, so he should answer at least 33 questions rightly.

Given Ayush did not attempt all questions, so he can attempt at most 39 questions.

But also given his total obtained mark should be multiple of 23 and 3.

only 69 is multiple of 23 and 3, In the range of 65 - 78 marks

wrong questions attempt should be multiple of 4

So, Only one possible case is possible

Total attempt = 39

Right attempt = 35

And wrong attempt = 4

25. (a): For each wrong answer marks deducted
 $= \frac{1}{4} = 0.25$

Let y number of questions wrongly answered by Mohit

$$\text{ATQ, } 26 \times 2 - 0.25 \times y = 46.25$$

$$0.25y = 52 - 46.25$$

$$y = 23$$

when 23 questions were wrong, then total no of questions attempt exceeds than total number of questions in quiz.

So, it possible Mohit left more than 6 question from the quiz, then only 4 marks will be deducted

$$\text{Now, } 52 - 4 = 48$$

$$\text{Now number of wrong question attempt by Mohit} \\ \Rightarrow 48 - 0.25y = 46.25$$

$$y = 7$$

$$\text{So, number of questions left by Mohit} = 40 - (26 + 7) = 7$$

$$\text{So total questions attempt by Divyaraj will be} = 33 + 4 = 37$$

Given, total marks obtained by Divyaraj is an even no. which is maximum and it is possible only when he answered wrong answer of 8 questions.

$$\text{Total attempt} = 37$$

$$\text{Rightly answered questions} = 37 - 8 = 29$$

$$\text{Total maximum even marks scored by Divyaraj} = 29 \times 2 - 8 \times 0.25 = 56$$

Sol. (26-30)

Company	Total	Paytm	Phone Pe	Google Pay	No. Application
A	500	200	175	50	75
B	650	100	312	208	30
C	800	200	240	280	80
D	750	225	150	225	150
Total		725	877	763	335

26. (b): Google pay users (B and C) $= 650 \times \frac{32}{100} + 800 \times \frac{35}{100}$
 $= 488$

Total paytm users (A and B)

$$= 500 \times \frac{40}{100} + \left(650 \times \frac{20}{100} \times \frac{10}{13} \right) = 300$$

$$\therefore \text{Required \%} = \frac{488-300}{300} \times 100$$

$$= 63\% \text{ more}$$

27. (b): Total Phone pay users in all companies together

$$= \left(500 \times \frac{35}{100} \right) + \left(650 \times \frac{48}{100} \right) + \left(800 \times \frac{40}{100} \times \frac{3}{4} \right) + \left(750 \times \frac{70}{100} \times \frac{2}{7} \right)$$

$$= 877$$

Total google pay users in all companies

$$= \left(500 \times \frac{25}{100} \times \frac{2}{5} \right) + \left(650 \times \frac{32}{100} \right) + \left(800 \times \frac{35}{100} \right) + \left(750 \times \frac{70}{100} \times \frac{3}{7} \right)$$

$$= 763$$

$$\therefore \text{Difference} = 877 - 763$$

$$= 114$$

28. (b): Paytm and phone pay users of company C =

$$\left(800 \times \frac{25}{100} \right) + \left(800 \times \frac{40}{100} \times \frac{3}{4} \right)$$

$$= 440$$

Phone pay and google pay user of company A =

$$500 \times \frac{35}{100} + 500 \times \frac{25}{100} \times \frac{2}{5}$$

$$= 225$$

$$\therefore \text{Required ratio} = \frac{440}{225} = \frac{88}{45}$$

$$= 88 : 45$$

29. (e): Total phone pay users

$$= \left(500 \times \frac{35}{100} \right) + \left(650 \times \frac{48}{100} \right) + \left(800 \times \frac{40}{100} \times \frac{3}{4} \right) + \left(750 \times \frac{70}{100} \times \frac{2}{7} \right)$$

$$= 877$$

Total users using no application

$$= \left(500 \times \frac{25}{100} \times \frac{2}{5} \right) + \left(650 \times \frac{20}{100} \times \frac{3}{13} \right) + \left(800 \times \frac{40}{100} \times \frac{1}{4} \right) + \left(750 \times \frac{70}{100} \times \frac{2}{7} \right)$$

$$= 335$$

$$\therefore \text{Required users} = 877 + 335$$

$$= 1212$$

$$30. (a): \text{Total google pay users} = \left(500 \times \frac{25}{100} \times \frac{2}{5}\right) + \left(650 \times \frac{32}{100}\right) + \left(800 \times \frac{35}{100}\right) + \left(750 \times \frac{70}{100} \times \frac{3}{7}\right) = 763$$

$$\text{Total paytm users} = \left(500 \times \frac{40}{100}\right) + \left(650 \times \frac{20}{100} \times \frac{10}{13}\right) + \left(800 \times \frac{25}{100}\right) + \left(750 \times \frac{30}{100}\right) = 725$$

$$\therefore \text{Required difference} = 763 - 725 = 38$$

31. (b): Let approved male applications and approved female applications be $11x$ and $7x$ respectively

$$\text{Given, } 11x - 7x = 4x = 200$$

$$\text{So, } x = 50$$

$$\text{And, } 18x = 900.$$

$$\text{So, } P = 900 \times \frac{100}{60} = 1500$$

$$\text{Required percentage} = \frac{1500 - 800}{800} \times 100 = 87.5\%$$

32. (a): Let approved male applications and approved female applications be $43x$ and $17x$ respectively

$$\text{Given, } 43x - 17x = 234$$

$$x = 9$$

$$60x = 540$$

$$S = 540 \times \frac{100}{45} = 1200$$

$$\text{Required sum} = 1200 + 1400 + 1600 = 4200$$

33. (c): Let approved male applications and approved female applications be $11x$ and $7x$ respectively

$$\text{Given, } 11x - 7x = 4x = 100$$

$$\text{So, } x = 25$$

$$\text{And, } 18x = 450.$$

$$\text{So, } P = 450 \times \frac{100}{60} = 750$$

$$\text{Cancel application in medical department} = 1600 \times \frac{35}{100} = 560$$

$$\text{Required difference} = 750 - 560 = 190$$

34. (d): Total approved application in vocational department = $800 \times \frac{40}{100} = 320$

Given, approved male applications is 40 more than approved female application

Let approved female application be 'x'

So, approved male application = $x + 40$

$$x + x + 40 = 320$$

$$x = 140$$

$$\text{And } (x + 40) = 180$$

$$\text{Required ratio} = 140 : 180 = 7 : 9$$

$$35. (e): \text{Required ratio} = 1600 \times \frac{35}{100} : 800 \times \frac{60}{100} = 560 : 480 = 7 : 6$$

36. (a): Let approved male applications and approved female applications be $29x$ and $21x$ respectively

$$29x - 21x = 112$$

$$x = 14$$

$$50x = 700$$

$$Q = 1400 - 700 = 700$$

$$\text{Required sum} = 700 + 1600 = 2300$$

Sol. (37 - 41):

Years	CAT		MAT		SAT	
	Filled	Attempted	Filled	Attempted	Filled	Attempted
2018	2000	Y (let)	1600	1200	A (let)	800
2019	2400	2200	Z (let)	1000	1400	B (let)
2020	X (let)	2400	2000	1800	1800	1600

$$37. (d): Y + 1200 + 800 = 3600$$

$$Y = 1600$$

$$Z = \frac{75}{100} \times 1600 = 1200$$

Required percentage

$$= \frac{1200 + 1000 + 1800}{1600 + 1200 + 2000} \times 100 = 83\frac{1}{3}\%$$

$$38. (c): \frac{A}{E} = \frac{7}{3}$$

Let X & B be $7x$ & $3x$ respectively.

ATQ,

$$B = A = 3x$$

$$A + 1400 + 1800 = 4400$$

$$A = 1200 = B$$

Now,

$$3x = 1200$$

$$\text{So, } x = 400$$

$$\text{And, } X = 2800$$

$$\text{Required answer} = (2800 - 2400) + (2000 - 1800) + (1800 - 1600) = 800$$

$$39. (e): 2000 + 2400 + X = 8000$$

$$X = 3600$$

$$\text{Now, } \frac{2400}{3600} \times 100 = \frac{1000}{Z} \times 100$$

$$Z = 1500$$

Percentage of applicants who attempted MAT

$$\text{In 2018} = \frac{1200}{1600} \times 100 = 75\%$$

$$\text{In 2019} = \frac{1000}{1500} \times 100 = 66\frac{2}{3}\%$$

$$\text{In 2020} = \frac{1800}{2000} \times 100 = 90\%$$

$$40. (b): 400 > Z - 1000 > 200$$

$$1200 < C < 1400$$

$$\text{And, } Z = B$$

Required ratio = $E : 1600$ (ratio should be less than 1)

$$\text{Or, } 0.75 < \text{required ratio} < 0.875$$

Only (b) satisfies

41. (d): to find $X = ?$

$$\text{From I, } Y = Z$$

$$\text{From II, } 4400 + X - Y - 4600 = 3600 + Z - 4000$$

$$X = Y + Z - 200$$

$$\text{From I \& II, } X = 2Y - 200$$

Clearly, A can't be determined even using both statements

Sol. (42 - 47)**For A:** let chess scores obtained by Aman be 'x'

$$\text{So, } x - 1/6 \times (500 - x) = 80$$

$$\text{Or, } 6x - 500 + x = 80 \times 6 = 480$$

$$\text{Or, } 7x = 980$$

$$x = 140$$

$$\text{So, } A = 140/500 \times 100 = 28\%$$

$$\text{For B: } \frac{30}{100} \times B - 2/7 \times \frac{70}{100} \times B = 70$$

$$.30B - 20B = 70$$

$$B = 700$$

$$\text{For C: Chess scores obtained by Chris} = 35 \times 600/100 = 210$$

$$\text{Poker scores obtained by Chris} = 210 - 30 = 180$$

$$\text{Pubg score obtained by Chris} = 600 - 210 - 180 = 210$$

$$\text{So, the ratio of scores between Pubg to poker} = 210/180 = 7:6$$

$$\text{So, } C = 7$$

$$\text{For D: } \frac{45}{100} \times D - \frac{9}{22} \times \frac{55}{100} \times D = 90$$

$$90D - 45D = 18000$$

$$45D = 18000$$

$$D = 400$$

$$\text{For E: Chess scores obtained by Emmy}$$

$$= 40 \times 800/100 = 320$$

$$\text{Poker scores obtained by Emmy} = 320 - 120 = 200$$

$$\text{Pubg score obtained by Emmy} = 800 - 320 - 200 = 280$$

$$\text{So, the ratio of scores obtained by Emmy in Pubg and poker} = 280/200 = 7:5$$

$$\text{So, } E = 5$$

Friends	Total score	% of chess score	Pubg score	Poker score
Aman	500	.28 × 500 = 140	360 × 5/6 = 300	360 × 1/6 = 60
Boby	700	.30 × 700 = 210	490 × 5/2 = 350	490 × 2/7 = 140
Chris	600	.35 × 600 = 210	390 × 7/13 = 210	390 × 6/13 = 180
David	400	.45 × 400 = 180	220 × 13/22 = 130	220 × 9/22 = 90
Emmy	800	.40 × 800 = 320	560 × 7/12 = 280	560 × 5/12 = 200

$$42. (a): \text{Req. Difference} = 700 - 400 = 300$$

$$43. (e): \text{Score obtained by Aman in golf} = 140 \times 13/28 = 65$$

$$44. (c): \text{Required ratio} = 210/180 = 7:6$$

$$45. (d): \text{Req. difference} = 210 - 200 = 10$$

$$46. (b): \text{Req. average} = \frac{500 + 700 + 600 + 400 + 800}{5} = 600$$

$$47. (b): \text{Req. percentage} = (800 - 600) \times 100/800 = 25\%$$

$$48. (d): \text{Total goals scored by Messi \& Neymar in La Liga} = 540 - (176 + 144 + 120) = 100$$

$$\text{Total goals scored by Messi and Ronaldo in UEFA}$$

$$= 480 - (220 + 40 + 156) = 64$$

$$\text{Maximum possible goal scored by Messi in La Liga}$$

$$= 540 \times \frac{10}{100} = 54$$

$$\text{Maximum possible goal scored by Messi in UEFA}$$

$$= 480 \times \frac{10}{100} = 48$$

But Messi can't score more than 40 goals, because Luka scored 40 goals in this league and also given missing values are least

So, Maximum possible goal scored by Messi in UEFA = 39

$$\text{Total goals scored by Messi in all the four leagues} = (54 + 200 + 39 + 106) = 399$$

$$\text{Total goals scored in all four leagues} = 540 + 600 + 480 + 400 = 2020$$

$$\text{Required percentage} = \frac{399}{2020} \times 100 = 19.75\%$$

$$49. (a): \text{Total goals scored by Messi \& Neymar in La Liga} = 540 - (176 + 144 + 120) = 100$$

$$\text{Total goals scored by Neymar \& Rodriguez in Bundesliga} = 600 - (200 + 130 + 150) = 120$$

$$\text{Total goals scored by Messi \& Ronaldo in UEFA} = 480 - (220 + 40 + 156) = 64$$

$$\text{Total goals scored by Neymar \& Rodriguez in ISL} = 400 - (106 + 104 + 112) = 78$$

For La Liga -

Possible case when absolute difference between goals scored by Messi \& Neymar is minimum = 51 - 49 = 2

$$\text{Goal scored by Messi} = 51$$

$$\text{And, goal scored by Neymar} = 49$$

For Bundesliga -

Possible case when absolute difference between goals scored by Messi \& Neymar is minimum only when Neymar scored at least 10% of total goals scored in this league

$$\text{So, Maximum goals scored by Neymar} = 60$$

For UEFA -

Possible case when absolute difference between goals scored by Messi \& Neymar is minimum only when Messi scored less than 40 goals because Luka scored 40 goals in this league and also given missing values are least.

$$\text{So, Maximum possible goal scored by Messi in UEFA} = 39$$

For ISL -

Possible case when absolute difference between goals scored by Messi \& Neymar is minimum only when Neymar scored at least 10% of total goals scored in this league

$$\text{So, Maximum goals scored by Neymar} = 40$$

$$\text{Total possible goals scored by Messi} = (51 + 200 + 39 + 106) = 396$$

$$\text{Total possible goals scored by Neymar} = (49 + 60 + 220 + 40) = 369$$

$$\text{Required ratio} = \frac{369}{396} = 41 : 44$$

50. (c): Total goals scored by Neymar & Rodriguez in Bundesliga = $600 - (200 + 130 + 150) = 120$
 Maximum possible goals scored by Rodriguez in Bundesliga = $600 \times \frac{10}{100} = 60$
 Total goals scored by Neymar & Rodriguez in ISL = $400 - (106 + 104 + 112) = 78$
 Maximum possible goals scored by Rodriguez in ISL = $400 \times \frac{10}{100} = 40$
 Total maximum possible goals scored by Rodriguez in all the four leagues = $(120 + 60 + 156 + 40) = 376$
 Total goals scored by Messi & Neymar in La Liga = $540 - (176 + 144 + 120) = 100$
 Total goals scored by Messi and Ronaldo in UEFA = $480 - (220 + 40 + 156) = 64$
 Minimum possible goals scored by Messi in La Liga = $100 - 540 \times \frac{10}{100} = 46$
 Maximum possible goal scored by Ronaldo in UEFA = $480 \times \frac{10}{100} = 48$
 But Ronaldo can't score more than 40 goals, because Luka scored 40 goals in this league and also given missing values are least
 So, Maximum possible goal scored by Ronaldo in UEFA = 39
 Minimum possible goals scored by Messi in UEFA = $64 - 39 = 25$
 Total minimum possible goals scored by Messi in all the four leagues = $(46 + 200 + 25 + 106) = 377$
 Required difference = $377 - 376 = 1$

51. (b): Total goals scored by Messi & Neymar in La Liga = $540 - (176 + 144 + 120) = 100$
 Total goals scored by Neymar & Rodriguez in Bundesliga = $600 - (200 + 130 + 150) = 120$
 Total goals scored by Messi & Ronaldo in UEFA = $480 - (220 + 40 + 156) = 64$
 Total goals scored by Neymar & Rodriguez in ISL = $400 - (106 + 104 + 112) = 78$
 Total minimum possible goals scored by Neymar in all the four leagues = $(46 + 60 + 220 + 38) = 364$
 Total maximum possible goals scored by Ronaldo in all the four leagues = $(176 + 130 + 39 + 104) = 449$
 Required difference = $449 - 364 = 85$

Sol. (52 - 54):

Total number of runs scored by Rohit with three runs = $3 \times 1200 = 3600$

Total number of two hits by Kohli = $3600 \times \frac{3}{4} \times \frac{1}{2} = 1350$

Let total number of three Hits by Dhoni be 'A'

Given, total number of runs scored by all three players with three = 11100

$(1500 + A + 1200) \times 3 = 11100$

$3A = 11100 - 8100$

$A = 1000$

Average of total runs scored by Kohli & Rohit with one run = $\frac{3000+1500}{2} = 2250$

Total number of one run hit by Dhoni = $2250 \times \frac{6}{5} = 2700$

Let total number of four hits by Kohli be '2x'

So, total number if four hits by Rohit will be '3x'

Total runs scored by Kohli with four runs = $4 \times 2x = 8x$

Total runs scored by Dhoni with six runs = $8x \times \frac{67.5}{100} = 5.4x$

ATQ

$5.4x = \frac{45}{100} \times 1000 \times 3$
 $x = 250$

Total number of six hits by Dhoni = $\frac{250 \times 5.4}{6} = 225$

Total number of two hits by Rohit

= $160 \times 6 \times \frac{100}{64} \times \frac{1}{2} = 750$

Total number of four hits by Kohli = $2 \times 250 = 500$

Total number of four hits by Rohit = $3 \times 250 = 750$

Type of runs	Kohli	Dhoni	Rohit
one runs	3000	2700	1500
two runs	1350	2400	750
three runs	1500	1000	1200
four runs	500	400	750
six runs	240	225	160
Total runs scored	13640	13450	10560

52. (d): Let total number of balls faced by Kohli = 100a

So, total number of balls faced by Rohit = $(100a + 4000)$

And, total dot balls faced by Kohli = $100a \times \frac{17.625}{100} = 17.625a$

Total scoring balls faced by Kohli = $(3000 + 1350 + 1500 + 500 + 240) = 6590$

Given, $100a - 17.625a = 6590$

$82.375a = 6590$

$a = 80$

Total balls faced by Kohli = 8000

Total balls faced by Rohit = $8000 + 4000 = 12000$

Strike rate of Kohli (V) = $\frac{13640}{8000} \times 100 = 170.5$

Strike rate of Rohit (R) = $\frac{10560}{12000} \times 100 = 88$

Required difference = $170.5 - 88 = 82.5$

53. (a): Let total number of matches in which Kohli and Dhoni remain not out be y and 2y respectively

So, total number of matches in which Kohli get out = $(225 - y)$

And, total number of matches in which Dhoni got out = $(450 - 2y)$

Total runs scored by Kohli = 13640

Total runs scored by Dhoni = 13450

ATQ –

$$\frac{13640}{225-y} - \frac{13450}{450-2y} = 34.575$$

$$13640 - 6725 = 7779.375 - 34.575y$$

$$6915 = 7779.375 - 34.575y$$

$$y = 25$$

$$\text{Required percentage} = \frac{25}{225} \times 100 = 11\frac{1}{9}\%$$

- 54. (a):** Let total number of dot balls faced by Dhoni be 'N'
Total balls at which Rohit scored = 4360

$$\text{Strike rate of Rohit} = \frac{10560}{4360+3640} = 132$$

$$\text{Strike rate of Dhoni} = 132 + 2.5 = 134.5$$

$$\text{Total balls at which Dhoni scored} = 6725$$

ATQ –

$$\text{Total balls faced by Dhoni} = \frac{13450}{134.5} \times 100 = 10000$$

$$\text{Total dot balls played by Dhoni (N)} = 10000 - 6725 = 3275$$

$$\text{Total innings played by Dhoni} = \frac{10000}{50} = 200$$

$$\text{Batting average of Dhoni} = \frac{13450}{160} = 84.0625$$

$$\text{Batting average of Rohit}$$

$$= 84.0625 - 18.0625 = 66$$

$$\text{Total innings played by Rohit}$$

$$= \frac{10560}{66} + 50 = 160 + 50 = 210$$

$$\text{Required difference} = 3275 - 210 = 3065$$

- 55. (d):** Let total current accounts opened in city P = x
given, $\frac{5x}{18} = 10000$

$$x = 10000 \times \frac{18}{5}$$

$$x = 36000$$

$$\text{Total number of accounts opened in city P}$$

$$= \frac{36000}{4} \times 15$$

$$= 135000$$

$$\text{Number of total branches in city P}$$

$$= \frac{\text{Total accounts(saving+current)}}{\text{average number of accounts opened in each branches}} = \frac{135000}{900} = 150$$

$$\text{total Number of branches in city R} = \frac{38400}{400} = 96$$

$$\text{Required}\% = \frac{150-96}{96} \times 100$$

$$= 56.25\%$$

- 56. (c):** Let total number current accounts opened in city U = y

Given

$$\frac{13y}{25} - \left(y - \frac{13y}{25}\right) = 320$$

$$y = 25 \times 320$$

$$y = 8000$$

$$\text{Total accounts opened in city U}$$

$$= \frac{8000}{2} \times 7$$

$$= 28000$$

Average number of accounts opened in each branch in city U

$$= \frac{28000}{112}$$

$$= 250$$

$$\text{Number of branches in city R} = \frac{38400}{400} = 96$$

$$\text{Required ratio} = \frac{250}{96} = 125:48$$

- 57. (b):** Let total current accounts is X and total saving account (23800 - X) in city T

ATQ—

$$(23800 - X) 12.5 + 7.5X = 262500$$

$$297500 - 12.5X + 7.5X = 262500$$

$$X = \frac{35000}{5}$$

$$(\text{Current accounts}) X = 7000$$

$$(\text{Saving accounts}) = (23800 - 7000)$$

$$= 16800$$

$$\text{Required difference} = 16800 - 7000 = 9800$$

- 58. (a):** Total saving accounts in city Q

$$= 44800 \times \frac{5}{7} = 32000$$

$$\text{Total saving accounts in city S}$$

$$= 72 \times 550 \times \frac{7}{11} = 25200$$

$$\text{Required average} = \frac{(32000+25200)}{2} = 28600$$

- 59. (b):** Total revenue generated by clothing & Cosmetic section together of Ajio = $\frac{8}{20} \times [100 - (15 + 20 + 12.5)]$

$$= \frac{8}{20} \times 52.5$$

$$= 21 \text{ million}$$

Revenue generated by Home and living section of Jabong =

$$45 \times \frac{[100 - (10 + 25 + 5 + 15)]}{100} = 45 \times \frac{45}{100}$$

$$\text{Required percentage} = \frac{21}{45 \times \frac{45}{100}} \times 100$$

$$= 103\frac{19}{27}\% = 104\%$$

- 60. (c):** Revenue generated by Footwear section of

$$\text{Myntra} = [100 - (30 + 17.5 + 5)] \times \frac{10}{19}$$

$$= 47.5 \times \frac{10}{19} = 25$$

$$\text{Required ratio} = \frac{\frac{65 \times 25}{100}}{\frac{75 \times [100 - (40 + 5 + 7.5 + 35)]}{100}}$$

$$= \frac{65 \times 25}{75 \times 12.5} = 26:15$$

- 61. (a):** Total revenue generated by cosmetic and clothing section together by Ajio.

$$= \frac{5}{12.5} \times [100 - (15 + 20 + 12.5)]$$

$$= \frac{5}{12.5} \times 52.5$$

$$= 21 \text{ million}$$

Total revenue generated by cosmetic and Home & living section together by Flipkart
 $= 75 \times \frac{[100 - (40 + 5 + 35)]}{100} = \frac{3}{4} \times 20$
 $= 15$ million
Required difference = $21 - 15 = 6$ million

62. (e): Total revenue generated by all sections of Snapdeal
 $= \frac{12.5}{25} \times 100 = 50$ million
Total revenue generated by all sections of Ajio
 $= \frac{6}{15} \times 100 = 40$ million
Required percentage = $\frac{50 - 40}{40} \times 100 = 25\%$

63. (d): Let total sold mobile phones of 'A' = x
ATQ—
 $\frac{14x}{100} = 560$
 $x = 4000$
Total 64 GB returned mobile phone of 'D'
 $= \left(4000 \times \frac{65}{100} \times \frac{10}{100}\right) \times \frac{325}{100}$
 $= 845$
Total 32 GB returned mobile phone of 'A'
 $= 560 - 4000 \times \frac{65}{100} \times \frac{10}{100} = 300$
Total 32 GB returned mobile phone of 'D'
 $= 8750 \times \frac{22}{100} - 845 = 1080$
Required percentage = $\frac{300}{1080} \times 100 = 27\frac{7}{9}\%$

64. (a): Total returned mobile phone of 'B'
 $= 8750 \times \frac{22}{100} \times \frac{8}{7} = 2200$
Total 32 GB mobile phone sold of 'B'
 $= 8750 \times \frac{32}{100} + 1950$
 $= 4750$
Total 64 GB returned mobile phone of 'B'
 $= (12750 - 4750) \times \frac{20}{100}$
 $= 1600$
Total 64 GB returned mobile phone of 'D' = 1600
 $- 600 = 1000$
Required difference = $8750 \times \frac{32}{100} - 1000 = 1800$

65. (b): Let total number of sold 'A' and 'E' be 5x and 6x respectively
 $5x + 6x = 8800$
 $x = 800$
Total phone 'A' sold = 4000
Total phone 'E' sold = 4800
Total returned mobile phone of 'E'
 $= 4800 \times \frac{15}{100} = 720$
Total returned 32 GB mobile phone of 'E'
 $= 720 - 4800 \times \frac{65}{100} \times \frac{10}{100}$
 $= 720 - 312 = 408$
Required ratio = $\frac{408}{4000 \times \frac{65}{100} \times \frac{10}{100}}$
 $= \frac{408}{260} = 102 : 65$

Previous Years' Questions of Prelims

Direction (1 - 5): Given below table shows number of seats available in five different buses and percentage of seats booked in these buses out of total available seats. Read the data carefully and answer the questions.

Buses	Total seats available	Percentage of seats booked, out of total available seats
A	20	60%
B	24	75%
C	15	60%
D	NA	80%
E	NA	62.5%

Note – Total seats available in any bus = Booked seats + Vacant seats

(ii) Total seats available in bus D & E together is 65.

(ii) Total vacant seats in all five buses are 40.

- If total vacant seats in bus C is 60% less than that of in bus E, then find number of vacant seats in D?
(a) 6 (b) 5 (c) 4 (d) 7 (e) 3
- Find ratio of total vacant seats in bus B to total booked seats in bus A?
(a) 1 : 3 (b) 1 : 2 (c) 2 : 3 (d) 3 : 4 (e) 1 : 1
- Vacant seats in bus C are what percent less than vacant seats in bus A?
(a) 15% (b) 20% (c) 30% (d) 25% (e) 36%

4. What percent of seats remained vacant in bus A, C & D, if ratio of total seats booked in bus B to bus E is 18 : 25?
 (a) 30% (b) $33\frac{2}{3}\%$ (c) $31\frac{2}{3}\%$ (d) $33\frac{1}{3}\%$ (e) None of these
5. If difference between total vacant seats in bus D and E is 10, then find ratio of booked seats in D to E?
 (a) 4 : 3 (b) 4 : 5 (c) 4 : 7 (d) 3 : 5 (e) 3 : 4
6. Find average number of booked seats in bus A, B & C?
 (a) 13 (b) 8 (c) 9 (d) 11 (e) 7

Direction (7– 12): Table given below shows the number of managers, leaders and other employees who work in five different companies, also given total employee in each company. Some data are missing, calculate the missing data if required. Read the data carefully and answer the questions.

Company	Number of managers	Number of leaders	Number of other Employees	Total number of employees
Company A	80	----	----	330
Company B	----	125	-----	475
Company C	75	-----	335	610
Company D	----	135	-----	385
Company E	80	-----	210	400

The total number of employees in any company = Number of (managers + leaders + other employees) in that company.

7. If the number of other employees in company A is 50% more than the number of leaders in the same company, then find the number of leaders in company A is what percentage of the total number of employees in company E?
 (a) 22% (b) 35% (c) 25% (d) 28% (e) 27%
8. Find the average number of total employees in all the give five companies?
 (a) 450 (b) 440 (c) 420 (d) 380 (e) 460
9. Find the ratio of total number of leaders in company C to the total number of employees in company D?
 (a) 40:79 (b) 40:73 (c) 39:74 (d) 47:87 (e) 40:77
10. If the ratio of the number of managers to the number of other employees in company D is 1:4, then find the number of managers in company E is what percentage more or less than the number of managers in company D?
 (a) 55% (b) 60% (c) 63% (d) 58% (e) 73%
11. If the number of managers in company B is 25% more than the number of managers in company A, then find the number of other employees in company B is how much more than the number of leaders in company D?
 (a) 102 (b) 116 (c) 127 (d) 142 (e) 115
12. If the total number of employees in company F is equal to average number of employees in company B & company D together and the ratio of the number of managers, leaders and other employees in company F is 2:3:5 respectively, then find the number of leaders in company F?
 (a) 129 (b) 139 (c) 142 (d) 154 (e) 160

Direction (13 – 17): Table given below shows Revenue, expenditure profit and loss percentage of a company in five different years. Read the data carefully and answer the questions.

Note – Positive sign (+) shows profit percentage and negative sign (–) shows loss percentage.

Years	Revenue (in cr.)	Expenditure (in cr.)	Profit and loss percentage
2001	720	—	+ 12.5
2002	—	875	– 4
2003	—	—	+ 20
2004	1134	—	+ 5
2005	—	—	– 30

$$\text{Profit or loss percent} = \frac{\text{Revenue/Expenditure} - \text{Revenue/Expenditure}}{\text{Expenditure}} \times 100$$

13. Find the difference between expenditure of company in the year 2001 and revenue of company in the year 2002?
 (a) 240 cr. (b) 280 cr. (c) 200 cr. (d) 320 cr. (e) 360 cr.
14. If profit of company in the year 2003 is two times of profit of company in the year 2001, then find the ratio of expenditure of company in the year 2001 to that of in the year 2003?
 (a) 4 : 7 (b) 3 : 5 (c) 4 : 9 (d) 4 : 5 (e) 2 : 3
15. Total loss of company in the year 2002 is approximate what percent less than profit of company in the year 2004?
 (a) 35% (b) 30% (c) 25% (d) 20% (e) 12%
16. Total loss of company in the year 2002 is $19\frac{4}{9}\%$ of total loss of company in the year 2005. Find total revenue of company in the year 2001 is what percent more than total expenditure of company in the year 2005?
 (a) 15% (b) 20% (c) 25% (d) 30% (e) 35%
17. If loss of company in 2005 is 180 cr. and profit in 2003 is 120cr. then find the ratio of expenditure of company in 2005 to expenditure in 2003.
 (a) 1:1 (b) 1:2 (c) 2:1 (d) 3:2 (e) none of these.

Directions (18-21): Study the given table carefully to answer the following questions.

In the given table there are five colleges in which total student and percentage of engineering students and ratio of arts and commerce students are given.

There are only three types of streams in each college.

Note → some data are missing, calculate the missing data if necessary.

Colleges	Total no. of Students	Percentage of Engineering students	Ratio of arts to commerce students
P	1250	28%	—
Q	—	25%	—
R	—	—	5:8
S	2100	—	5:2
T	1440	—	—

18. If the ratio of boys and girls in college P for commerce student is 2 : 5 and the commerce student are 40% more than arts student. Then find the difference of boys and girls in Commerce?
 (a) 225 (b) 275 (c) 250 (d) 325 (e) 215
19. If the total engineering student in college T is 360 and student in arts are 25% more than the student in commerce and engineering student in college S is 630. Then find ratio of arts student in college S to college T?
 (a) 2 : 3 (b) 4 : 7 (c) 4 : 9 (d) 7 : 4 (e) 7 : 8
20. If Engineering students in college P is 150 less than engineering student in college Q. Then total student in college S is what percent more or less than total student in college Q?
 (a) 1% (b) 3% (c) 9% (d) 7% (e) 5%
21. If total student in college R is 2600 and total engineering student in college R is equal to the total students in arts and commerce. And ratio of boys and girls in college R in engineering 5 : 8. If 20% of boys are transferred to college T. Then find total student in college T?
 (a) 1640 (b) 1840 (c) 1920 (d) 1540 (e) 1640

Directions (22-25): Table given below shows population of five villages and percentage of male, female and transgenders among them.

Villages	Total	Male	Female	Transgender
A	12,000	46%	—	22%
B	16,000	—	33%	27%
C	18,000	32%	36%	—
D	24,000	36%	—	20%
E	25,000	—	30%	25%

22. Total number of females in village 'B' and 'D' together is what percent more than total number of males in village 'C' ?
 (a) 275% (b) 225% (c) 125% (d) 175% (e) 150%
23. What will be the difference between number of males and females in village 'A' ?
 (a) 480 (b) 1120 (c) 1680 (d) 1920 (e) 2880
24. Find the ratio of population of transgenders in village 'C' to population of male in village 'B' ?
 (a) 9 : 10 (b) 7 : 8 (c) 3 : 4 (d) 27 : 32 (e) 3 : 5
25. Find the difference between males in village 'E' to females in village 'D' ?
 (a) 710 (b) 690 (c) 610 (d) 830 (e) 890

Previous Years' Solutions of Prelims

1. (b): Total vacant seats in bus E = $15 \times \frac{40}{100} \times \frac{100}{40} = 15$
 So, total vacant seats in bus A, B, C & D = $40 - 15 = 25$
 Total number of vacant seats in D = $40 - (15 + 20 \times \frac{40}{100} + 24 \times \frac{25}{100} + 15 \times \frac{40}{100}) = 5$

2. (b): Total vacant seats in bus B = $24 \times \frac{25}{100} = 6$
 Total booked seats in bus A = $20 \times \frac{60}{100} = 12$
 Required ratio = $6 : 12 = 1 : 2$

3. (d): Vacant seats in bus A = $20 \times \frac{40}{100} = 8$
 Vacant seats in bus C = $15 \times \frac{40}{100} = 6$
 Required percentage = $\frac{8-6}{8} \times 100 = 25\%$

4. (c): Total seats available in bus E = $24 \times \frac{75}{100} \times \frac{25}{18} \times \frac{8}{5} = 40$
 So, total seats available in bus D = $65 - 40 = 25$
 Required percentage = $\frac{20 \times \frac{40}{100} + 15 \times \frac{40}{100} + 25 \times \frac{20}{100}}{(20+15+25)} \times 100$
 $= \frac{8+6+5}{60} \times 100 = 31\frac{2}{3}\%$

5. (b): Let total seats in bus D = x
 So, total seats in bus E = $(65 - x)$
 ATQ -
 $(65 - x) \times \frac{3}{8} - x \times \frac{20}{100} = 10$
 $975 - 15x - 8x = 400$
 $23x = 575$
 $x = 25$
 So, required ratio = $25 \times \frac{80}{100} : (65 - 25) \times \frac{5}{8}$
 $= 20 : 25 = 4 : 5$

6. (a): Required average = $\frac{20 \times \frac{60}{100} + 24 \times \frac{75}{100} + 15 \times \frac{60}{100}}{3}$
 $= \frac{12+18+9}{3} = 13$

7. (c): Let the number of leaders in the company A = 2x

Then, the number of other employees in company

$$A = \frac{150}{100} \times 2x = 3x$$

$$\text{ATQ, } 80 + 2x + 3x = 330$$

$$x = 50$$

$$\text{Required result} = \frac{2 \times 50}{400} \times 100 = 25\%$$

8. (b): Required average = $\frac{330+475+610+385+400}{5} = 440$

9. (e): Total number of leaders in company C = $610 - 75 - 335 = 200$

Total number of employees in company D = 385

$$\text{Required ratio} = 200 : 385 = 40 : 77$$

10. (b): Let number of managers in company D be x.

Then, number of other employees in company D = 4x

ATQ,

$$x + 135 + 4x = 385$$

$$x = 50$$

$$\text{Required percentage} = \frac{80-50}{50} \times 100 = 60\%$$

11. (e): Number of managers in company B = $\frac{125}{100} \times 80 = 100$

So, number of other employees in company B =

$$475 - 100 - 125 = 250$$

$$\text{Required difference} = 250 - 135 = 115$$

12. (a): Total number of employees in company F = $\frac{1}{2} \times (475 + 385) = 430$

$$\text{Total number of leaders in company F} = \frac{3}{2+3+5} \times 430 = 129$$

13. (c): Let expenditure of company in the year 2001 be 'e'

$$\text{So, } e = 720 \times \frac{8}{9} = 640 \text{ cr.}$$

And let Revenue of company in the year 2002 be 'a'

$$\text{So, } a = 875 \times \frac{96}{100} = 840 \text{ cr.}$$

$$\text{Required difference} = 840 - 640 = 200 \text{ cr.}$$

- 14. (d):** Let expenditure of company in the year 2001 be 'e'

$$\text{So, } e = 720 \times \frac{8}{9} = 640 \text{ cr.}$$

$$\text{So, profit of company in the year 2003} = (720 - 640) \times 2 = 160 \text{ cr.}$$

Let expenditure in the year 2003 be '5x'

So, revenue of company will be '6x'

ATQ -

$$6x - 5x = 160$$

$$x = 160 \text{ cr.}$$

$$\text{Expenditure of company in the year 2003} = 800 \text{ cr.}$$

$$\text{Required ratio} = \frac{640}{800} = 4 : 5$$

- 15. (a):** Loss of company in the year 2002 = $875 \times \frac{4}{100} = 35 \text{ cr.}$

$$\text{Let total expenditure of company in the year 2004} = 100x$$

$$\text{So, total revenue of company in the year 2004} = 105x$$

ATQ -

$$1134 \times \frac{100x}{105x} = 1080 \text{ cr.}$$

$$\text{Profit of company in the year 2004} = 1134 - 1080 = 54 \text{ cr.}$$

$$\text{Required percentage} = \frac{54-35}{54} \times 100 = 35.15 \approx 35\%$$

- 16. (b):** Loss of company in the year 2002 = $875 \times \frac{4}{100} = 35 \text{ cr.}$

$$\text{Total loss of company in the year 2005} = 35 \times \frac{900}{175} = 180 \text{ cr.}$$

$$\text{Total expenditure of company in the year 2005} = 180 \times \frac{100}{30} = 600 \text{ cr.}$$

$$\text{Required percentage} = \frac{720-600}{600} \times 100 = 20\%$$

- 17. (a):** expenditure of company in 2005 = $\frac{180}{30} \times 100 = 600 \text{ cr.}$

$$\text{Expenditure of company in 2003} = \frac{120}{20} \times 100 = 600 \text{ cr.}$$

$$\text{Required ratio} = \frac{600}{600} = 1 : 1$$

- 18. (b):** Required number of windows phones

$$= \frac{7}{18} \times \frac{22}{100} \times 9000 + \frac{3}{10} \times \frac{24}{100} \times 9000$$

$$= 770 + 648 = 1418$$

- 19. (d):** Android phones sold by S = $\frac{9}{20} \times \frac{18}{100} \times 9000$

$$= 729$$

$$\text{Windows phones sold by R} = \frac{7}{15} \times 1350 = 630$$

$$\therefore \text{Required percentage} = \frac{729-630}{630} \times 100 \approx 15.71\%$$

20. (c): Sales of Q in July = $\left(100 + \frac{50}{9}\right) \% \text{ of } \frac{24}{100} \times 9000$

$$= \frac{950}{900} \times \frac{24}{100} \times 9000 = 2280$$

$$\text{Sales of S in July} = \left(100 + \frac{100}{27}\right) \% \text{ of } \frac{18}{100} \times 9000$$

$$= \frac{2800}{2700} \times \frac{18}{100} \times 9000 = 1680$$

$$\therefore \text{Total phones sold} = 2280 + 1680 = 3960$$

21. (a): Required ratio = $\frac{\frac{7}{18} \times \frac{22}{100} \times 9000}{\frac{7}{15} \times \frac{18}{100} \times 9000} = 11 : 9$

- 22. (d):** Number of females in village 'B' and 'D' together

$$= \frac{33}{100} \times 16,000 + \frac{(100-36-20)}{100} \times 24000$$

$$= 5280 + \frac{44}{100} \times 24000$$

$$= 5280 + 10560 = 15840$$

Number of males in village 'C'

$$= \frac{18000 \times 32}{100}$$

$$= 5760$$

$$\text{Required } \% = \frac{15840 - 5760}{5760} \times 100$$

$$= \frac{10080}{5760} \times 100$$

$$= 175\%$$

- 23. (c):** Required difference

$$= \frac{12000}{100} \times [46 - (100 - 46 - 22)]$$

$$= \frac{12000}{100} \times [46 - 32]$$

$$= \frac{12000}{100} \times 14 = 1680$$

- 24. (a):** Population of transgender in village 'C'

$$= \frac{(100-32-36)}{100} \times 18000$$

$$= \frac{32}{100} \times 18000$$

$$= 5760$$

Population of males in village 'B'

$$= \frac{(100-33-27)}{100} \times 16000$$

$$= \frac{40}{100} \times 16000$$

$$= 6400$$

$$\text{Required ratio} = \frac{5760}{6400} = \frac{9}{10}$$

- 25. (b):** Required difference

$$= \frac{45}{100} \times 25000 - \frac{44}{100} \times 24000$$

$$= 11250 - 10560 = 690$$

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Previous Years' Questions of Mains

Directions (1-5): Study the following table carefully and answer the questions that follow.

The table shows the data related top six schools of India. Some values are missing which you need to find out and answer the questions accordingly.

Schools	Number of teachers	Ratio of male to female teachers	Ratio of teachers to students	Percentage of non-teaching staff
Vasant valley	480	15 : 17	_ : _	15%
Woodstock	450	_ : _	1 : 6	10%
DPS	—	3 : 2	3 : 20	—
Rishi Valley	510	8 : 7	3 : 10	—
Pathways	—	2 : 7	2 : 5	20%
DAV	—	_ : _	2 : 7	15%

Note: Total strength of school = Number of teachers + Number of students + Number of non-teaching staff

- If female teachers of school Vasant valley are 17% of total strength of school, then what is the ratio of teachers to students in that school?
(a) 32 : 55 (b) 5 : 11 (c) 32 : 53 (d) 23 : 53 (e) 5 : 13
- The female students of Pathways school are $15\frac{5}{9}\%$ more than male teachers of school Vasant valley while ratio of male to female students of Pathways school is 14 : 13. Find the number of non-teaching staff of Pathways school.
(a) 180 (b) 192 (c) 210 (d) 189 (e) None of these
- If strength of all school is same, then find the number of non-teaching staff of school DAV.
(a) 420 (b) 525 (c) 580 (d) 630 (e) None of these
- If total strength and number of students of schools Woodstock and DPS are same, then teachers of DPS are what percent less than students of Woodstock?
(a) 80% (b) 85% (c) 72% (d) 92% (e) None of these
- Find the difference in total strength of school Woodstock and that of Rishi valley.
(a) 980 (b) 840 (c) 780 (d) can't be determined (e) None of these

Directions (6-8): Study the given table carefully and answer the following questions.

Persons	Amount	Denomination I	Denomination II	Denomination III
A	Rs. 1120	50	20	10
B	Rs. 3250	100	20	5
C	Rs. 5400	200	50	20
D	-	20	10	5

Notes: Number of notes of given denomination for each person is same (D I, D II and D III)

- Another person F has an amount equal to Rs. 25 more than the average amount of B and C and he has minimum two notes of Rs. 2000 and he also has notes of denomination of Rs. 200 and 50. Find the possible no. of notes of Rs. 50 denomination.
(a) 5 (b) 1 (c) 7 (d) 3 (e) 9
- D has an amount less than Rs. 1000 and no. of notes of each denomination is a prime number between 20 and 30. Find the total no. of notes D have.
(a) 46 (b) 23 (c) 69 (d) 29 (e) 87
- G has D I, D II and D III as Rs. 500, Rs. 20 and Rs. 10 respectively. If G has total amount of Rs. 3710, then find the no. of notes of each denomination which G has.
(a) 14 (b) 7 (c) 21 (d) 12 (e) 15

Direction (9-12): Given bar shows the % range of commission earned on all sold articles and commission earned by five stores in Rupees.

Stores	Range of commission (%)	Commission earned Ruppess
A	0-16	32000
B	16-32	—
C	—	35000
D	—	—
E	0-20	40000

Note:- Commission percent is on selling price.

Note:- Some values are missing, you have to calculate them according to question.

Note:- Range of commission are in integral values.

9. Store 'A' sells 480 articles of only 3 types of articles it have, their number are in ratio 1 : 2 : 3 and their selling prices are 800, 600 and 400 respectively and commission charged on them have difference of 1 percent in sequence (least number of articles sold have least commission percent) respectively, then find the highest commission% of articles.
 (a) 11.375% (b) 12.375% (c) 13.375% (d) 15.375% (e) None of these
10. Store C sells 3 products in equal numbers (105) and equal commission percent. If there selling price (in Rs.) are 200, 300 and 400. Then what is the commission percent.
 (a) $\frac{1200}{27}\%$ (b) $\frac{900}{27}\%$ (c) $\frac{1150}{27}\%$ (d) $\frac{1000}{27}\%$ (e) $\frac{1040}{27}\%$
11. Store D sold 3 articles each in number 100 and each have S.P. of Rs. 800 and commission % for each is in A.P. with common difference of 5. If total commission earned by store D is $14\frac{2}{7}\%$ more than that of store C. Find the minimum range of commission %?
 (a) (11 – 22) (b) (16- 23) (c) (05- 08) (d) (14 – 24) (e) (07 – 10)
12. If store C have only one type article and number of article and its S.P is equal which is (≥ 100 & < 110) then find the % range of commission?
 (a) (275 – 300) (b) (340 – 377) (c) (174 – 268) (d) (294 – 350) (e) (280 – 366)

Directions (13-18): Study the table given below and answer the following questions. Some data is missing in the table. Table shows data regarding Rs.20 notes received by 5 different banks during demonetization.

Banks	Total no. of notes received by bank	% of notes on which 100% return is given	Ratio of notes on which (50% return : 80% return) is given	Total value of Rs.20 notes received by bank (in Rs.)
PNB	15,000	-----	5 : 7	-----
SBI	-----	80%	-----	9,00,000
Axis Bank	10,000	-----	1 : 4	-----
BOI	-----	75%	3 : 5	-----
BOB	24,000	-----	-----	4,80,000

Note – 1. 'Return' is the amount (face value of note) of notes returned by bank to its customers.

2. Each bank has given minimum of 50% return on all notes received by it.

13. If difference of notes on which 50% return is given and on which 80% return is given of PNB is 1000, then find number of notes on which 100% return is given by PNB are what percent of total notes received by BOB?
 (a) 12.5% (b) 37.5% (c) 50% (d) 25% (e) 62.5%
14. If total number of notes on which BOI gave 100% return and 50% return are 13500, then find total amount received by BOI is how much more or less than total amount received by Axis bank?
 (a) Rs.1,20,000 (b) Rs.1,00,000 (c) Rs.1,50,000 (d) Rs.1,60,000 (e) Rs.1,80,000
15. If ratio of notes on which (50% return : 80% return) is given by BOB is same as ratio of notes on which (50% return : 80% return) is given by Axis bank and number of notes on which BOB gave 100% return are 20% less than total notes received by PNB, then find ratio of notes on which BOB gave 80% return to that of on which it gave 100% return.
 (a) 2 : 3 (b) 1 : 3 (c) 4 : 5 (d) 5 : 7 (e) None of the above.

16. If total number of notes received by BOI is 40% less than total number of notes received by SBI, then find average number of Rs.20 notes received by these 5 banks.
 (a) 24,700 (b) 25,000 (c) 25,400
 (d) 24,200 (e) Cannot be determined.
17. If percentage of notes on which 100% return is given by PNB is 50%, then find the amount earned by PNB in this whole transaction.
 (a) Rs.47,750 (b) Rs.44,500 (c) Rs.41,500 (d) Rs.45,750 (e) Rs.48,750
18. If difference of number of notes on which PNB gave 50% return and 80% return is 1500 and number of notes on which Axis bank gave 80% return are 1750 less than number of notes on which PNB gave 50% return, then find total number of notes on which PNB and Axis Bank gave 100% return together.
 (a) 12000 (b) 13000 (c) 12500 (d) 14000 (e) 13500

Directions (19-23): The given table shows the number of classes taken by five different students (P, Q, R, S and T) in different months of a year and fees paid by them for each class.

Students	Number of classes taken by each student in each month (30 days)	Number of classes taken by each student in each month (31 days)	Fees paid for each class
P	3	1	700
Q	2	3	600
R	2	—	800
S	4	2	500
T	—	3	750

Note:

- (i) Each student takes **three classes in Feb** and for every year data given is same.
 (ii) '—' is missing value
 (iii) Each class is of one hour.
 (iv) All students take classes from different teachers and all students takes classes in every month.

19. Find the ratio of number of classes taken by S to the number of classes taken by P in two year?
 (a) 3 : 4 (b) None of the above (c) 2 : 3 (d) 3 : 2 (e) 4 : 3
20. Find the number of classes taken by R in all the months of 31 days in a year if he paid total fees of Rs. 31,200 in that year.
 (a) 28 (b) 35 (c) 14 (d) 21 (e) 42
21. Find the difference between the total fees paid by S and Q if both take classes for two years only?
 (a) Rs. 4500 (b) Rs. 5000 (c) Rs. 6000 (d) Rs. 4800 (e) Rs. 5400
22. If R takes 2 classes on every month of 31 days in a year then total fees paid by R and Q together in that year is approximately what percent of total fees paid by P and S together in that year ?
 (a) 118% (b) 123% (c) 127% (d) 130% (e) 115%
23. If T takes no classes in any months of 30 days in a particular year then fees paid by P is what percent more or less than that of T in that particular year?
 (a) $13\frac{1}{3}\%$ (b) $13\frac{2}{9}\%$ (c) $14\frac{4}{9}\%$ (d) 15% (e) $16\frac{2}{3}\%$

Directions (24-28): The given table shows the number of classes taken by four different guest tutors (A, B, C and D) on different days in a week and honorarium paid to them for each class.

Tutors	Number of classes taken each on Monday, Tuesday and Wednesday	Number of class taken each on Thursday & Friday	Honorarium paid for each class (In Rs)
A	2	0	5000
B	3	—	8000
C	1	3	6000
D	2	2	4000

Note:

(i) Saturday and Sunday are Holiday.

(ii) '—' is missing value

(iii) Each class is of one hour.

24. Find the ratio of number of classes taken by A to the number of classes taken by D in a week?

- (a) 4 : 5 (b) 3 : 5 (c) 2 : 3 (d) 9 : 10 (e) None of the above

25. Find the number of classes taken by C if he is paid an honorarium of Rs. 3.78 lakh for the completion of his course.

- (a) 45 (b) 54 (c) 72 (d) 81 (e) 63

26. Find the difference between the honorarium paid to C, if he teaches for 3 weeks and the honorarium paid to D, if he teaches for 2 weeks?

- (a) Rs. 82,000 (b) Rs. 74,000 (c) Rs. 88,000 (d) Rs. 90,000 (e) Rs.80,000

27. If honorarium paid to B for the completion of his course is Rs. 5.28 lakh and B takes 6 weeks for completion of his course then honorarium paid to B and D together in 2 weeks is approximately what percent of the honorarium paid to C in 4 weeks?

- (a) 105% (b) 110% (c) 114% (d) 120% (e) 125%

28. If B takes no classes on Thursday and Friday in a particular week then honorarium paid to A is what percent of that of B in that week?

- (a) 38 $\frac{1}{3}$ % (b) 42 $\frac{1}{3}$ % (c) 41 $\frac{2}{3}$ % (d) 45% (e) 46 $\frac{2}{3}$ %

Directions (29-33):- The following Table DI shows the quantity of waste (Dry and Wet) picked by a truck on 5 different days. The capacity of the truck from Monday to Wednesday is 180 kg and for rest two days is 150 kg.

Day	Quantity of wet waste	Ratio of wet to dry waste	Difference between dry and wet waste. (wet>dry)
Monday	-	5 : 4	20 kg
Tuesday	110 kg	-	22 kg
Wednesday	99 kg	9 : 7	-
Thursday	84 kg	7 : y	24 kg
Friday	-	12 : 7	40 kg

Note:- If the waste produce in a day is greater than the capacity of the truck, then the extra amount of waste will be picked on next day.

29. If on Wednesday the truck picks only 80% of the waste of his capacity, then find the difference between the quantity picked of wet waste and dry waste on the same day? (priority given to wet waste)

- (a) 64 kg (b) 48 kg (c) 62 kg (d) 54 kg (e) 42 kg

30. What is the value of 'y'?

- (a) 4 (b) 5 (c) 6 (d) 3 (e) 8

31. Find the ratio of total dry waste produced on Monday, Tuesday and Friday together to wet waste produced on Wednesday and Thursday together?

- (a) 194 : 218 (b) 185 : 212 (c) 183 : 224 (d) 212 : 185 (e) 224 : 183

32. What is the amount of waste left by the end of the Wednesday?
 (a) 18 kg (b) 16 kg (c) 14 kg (d) 20 kg (e) 12 kg
33. Find the total quantity of dry waste on all the five days together?
 (a) 381 kg (b) 413 kg (c) 361 kg (d) 337 kg (e) 321 kg

Direction (34-38): The table shows the total no. of mails received in inbox by different users & the percentage of mails read by the users & the total no. of spam mails received in a month.

Users	Total no. of mails received in inbox	% of inbox mails read by user	Total no. of spam mails received
X	725	68%	88
Y	840	65%	82
Z	800	–	152
K	–	45%	92
L	580	–	76

Note:

- Total no. of mails received = Total mails received in inbox + total no. of spam mail received
 - Spam mails are not read by user.
 - Some data are missing, calculate if necessary.
34. Average no. of mails received in inbox by user X, Y & K is 750% of average no. of spam mail received by user X, Y and K. Then find the total no. of mails received by user K?
 (a) 492 (b) 528 (c) 426 (d) 482 (e) None of these
35. Inbox mails read by user Z is what percentage of total mails received in inbox of Z given that inbox mails read by user Z is 125% of total spam mails received by user K?
 (a) 14.375% (b) 19.25% (c) 24.125% (d) None of these (e) 11.215%
36. Inbox mails read by user X & Y together is how much more/less than spam mails received by the same user together?
 (a) None of these (b) 939 more (c) 728 less (d) 869 more (e) 829 more
37. Total no. of mails received by K is approximately what percent of inbox mails read by user X given that mails received in inbox by K is thrice of mails received in spam by X?
 (a) 54% (b) 62% (c) 78% (d) 68% (e) 72%
38. Number of inbox mails which are not read by user Z is 150% more than mails received in spam by user X. Then find average of inbox mails read by user Z & Y?
 (a) None of these (b) 618 (c) 425 (d) 563 (e) 589

Directions (39 – 43): Read the data carefully and answer the questions. Some data are missing which you have to calculate as per information provided in the questions.

Position	No. of applications received	No. of duplicate applications	Average no. of applications received from duplicate applicants
A	1040	63	4
B	880	--	6
C	600	28	--
D	--	48	--
E	420	--	--

NOTE - A duplicate applicant is an applicant who has submitted additional (duplicate) application after submitting their original application. All application forms (original + duplicate) received from duplicate applicant were rejected. Remaining all application were accepted. None of the applicants applied for more than one post.

39. For position A, if respective ratio between no. of accepted application from males & that of rejected applications from males is 5 : 3 & respective ratio of no. of accepted applications from females and that of rejected applications from females is 5 : 1 then find rejected applications from males.
 (a) 230 (b) 315 (c) 425 (d) 255 (e) 300

40. For position E, no. of accepted applications from males, females & no. of rejected applications (total) are X, X + Y, X + 2Y respectively. Which of the following is true? (average no. of duplicate applications received from duplicate applicant is non-zero integer)
 A. no. of accepted applications from males can be 139.
 B. no. of accepted applications from males can be 141.
 C. no. of accepted applications from males can be 131.
 (a) C (b) A & B (c) A & C (d) B (e) A
41. If average no. of accepted applications for position A & B is 659. What is the value of duplicate applications for position B?
 (a) 287 (b) 246 (c) 254 (d) 275 (e) 263
42. For position D, if respective ratio of accepted & rejected applications is 4 : 1. Which of the following can be true?
 A. no. of applications received (all original + all duplicate) can be 240.
 B. no. of applications accepted (all original + all duplicate) can be 768.
 C. least no. of applications were received for D is a possibility.
 (a) only B & C (b) none of the option (c) only C (d) only A & C (e) only B
43. for position C, no. of accepted applications from males is between 150 & 200 while that of females is between 130 & 180. Which of the following can be a possible value (s) of average no. of duplicate applications submitted by duplicate applications for position C?
 A. 11 B. 5 C. 9 D. 13 E. 7
 (a) B, C & E (b) C & E (c) A & D (d) B & E (e) A, C & D

Previous Years' Solutions of Mains

1. (c): Number of female teachers
 $= \frac{17}{32} \times 480 = 255$
 \therefore Total strength of school
 $= \frac{100}{17} \times 255 = 1500$
 Number of students
 $= 1500 - 480 - \frac{15}{100} \times 1500$
 $= 795$
 \therefore Required ratio $= \frac{480}{795} = \frac{32}{53}$
2. (d): Number of female students of Pathways
 $= \frac{1040}{900} \times 225$
 $= 260$
 Number of male students
 $= 260 \times \frac{14}{13}$
 $= 280$
 Number of teachers
 $= (260 + 280) \times \frac{2}{5} = 540 \times \frac{2}{5} = 216$
 Required number of non-teaching staff
 $= (540 + 216) \times \frac{20}{80} = 756 \times \frac{20}{80} = 189$
3. (b): Since strength of all schools is same.
 Students in Woodstock = $450 \times 6 = 2700$
 \therefore 90% of strength = $2700 + 450$
 \therefore total strength of Woodstock = $3150 \times \frac{100}{90} = 3500$
 So, required number of non-teaching staff
 $= 15\% \text{ of } 3500$
 $= 525$
4. (b): Total strength = 3500
 Teachers in DPS = $2700 \times \frac{3}{20} = 405$
 \therefore Required percentage = $\frac{2700-405}{2700} \times 100 = 85\%$
5. (d): We can't find the strength of school Rishi Valley with given data.
6. (d): Amount of F = $\frac{3250+5400}{2} + 25 = 4350$
 If he has minimum two notes of Rs. 2000 denomination. As he has only Rs. 4350, so he has not more than two notes of Rs. 2000 denomination.
 Remaining amount = $4350 - 4000 = 350$
 He has notes of Rs. 200 and Rs. 50 denomination.
 So, required no. of notes = $\frac{350-200}{50} = 3$
7. (c): Possible no. of notes of each denomination are 23 and 29. But he has an amount which is less than Rs. 1000.
 So, only 23 notes of each denomination can be possible.
 Amount of D = $20 \times 23 + 10 \times 23 + 5 \times 23 = \text{Rs. } 805$
 total no. of notes D have = $23+23+23 = 69$ notes

- 8. (b):** Let no. of notes of each denomination which G has be N.
 ATQ
 $500 \times N + 20 \times N + 10 \times N = 3710$
 $530 \times N = 3710$
 $N = 7$
 So, required no. = 7

- 9. (c):** Selling price of article, I $\Rightarrow 80 \times 800 = 64000$
 II $\Rightarrow 160 \times 600 = 96000$
 III $\Rightarrow 240 \times 400 = 96000$
 Let commission % be (a - 1), a and (a + 1) respectively.
 ATQ,
 $64000 \frac{(a-1)}{100} + \frac{96000(a)}{100} + \frac{96000(a+1)}{100} = 32000$
 $a = 12.375\%$
 highest commission = 13.375%

- 10. (d):** Total commission earned by C = 35000 Rs.
 Total selling price of product I = $105 \times 200 = 21000$ Rs.
 Total selling price of Product II = $105 \times 300 = 31500$ Rs.
 Total selling price of Product III = $105 \times 400 = 42000$ Rs.
 Let commission percent = x%
 $(21000 + 31500 + 42000) \times \frac{x}{100} = 35000$
 $= \frac{1000}{27} \%$

- 11. (a):** Total commission of D = $\frac{35000 \times 8}{7} = \text{Rs. } 40000$.
 S.P. of each product = $100 \times 800 = \text{Rs. } 80000$
 Let commission % charged on 3 products be (x - 5) %, x% and (x + 5) %.
 So,
 $80000 \frac{(x-5)}{100} + 80000 \frac{(x)}{100} + 80000 \frac{(x+5)}{100} = 40000$
 $2400x = 40000$
 $x = \frac{400}{24} = \frac{100}{6} \%$
 $x = 16 \frac{2}{3} \%$
 Least range could be = $16 - 5 = 11\%$
 $16 + 6 = 22\%$
 $= (11 - 22)$

- 12. (d):** Let total articles = x
 So S.P. = x
 Now total commission $\Rightarrow 35000$
 Minimum values of x = 100
 Maximum value of x = 109
 Let 'a' be commission %
 So, Max value of 'a' could be
 $(100 \times 100) \times \frac{a}{100} = 35000$
 $a = 350\%$
 Minimum value could be
 $109 \times 109 \times \frac{a}{100} = 35000 \approx 294.5$
 Range = (294 - 350)

- 13. (b):** Let number of notes on which 50% return is given and on which 80% return is given of PNB be 5x and 7x respectively.
 ATQ,
 $7x - 5x = 1000$
 $x = 500$
 So, number of notes on which 100% return is given by PNB = $15000 - (7 + 5) \times 500$
 $= 9000$
 Required % = $\frac{9000}{24000} \times 100$
 $= 37.5\%$

- 14. (a):** Let total number of notes received by BOI be 100x.
 So, number of notes on which BOI gave 100% return = 75x
 And number of notes on which BOI gave 50% return = $25x \times \frac{3}{8}$
 ATQ,
 $75x + \frac{75x}{8} = 13500$
 $\Rightarrow x = 160$
 Hence, total amount received by BOI = $20 \times 160 \times 100$
 $= \text{Rs. } 3,20,000$
 And total amount received by Axis bank = 20×10000
 $= \text{Rs. } 2,00,000$
 Required difference = $3,20,000 - 2,00,000$
 $= \text{Rs. } 1,20,000$

- 15. (c):** Number of notes on which BOB gave 100% return
 $= \frac{80}{100} \times 15000$
 $= 12,000$
 Number of notes on which BOB gave 80% return
 $= (24000 - 12000) \times \frac{4}{5}$
 $= 9,600$
 Required ratio = $\frac{9600}{12000} = 4 : 5$

- 16. (d):** Total number of notes received by SBI = $\frac{9,00,000}{20}$
 $= 45,000$
 Total number of notes received by BOI
 $= \frac{60}{100} \times 45000 = 27,000$
 Required average
 $= \frac{15,000 + 45,000 + 10,000 + 27,000 + 24,000}{5}$
 $= \frac{1,21,000}{5} = 24,200$

17. (e): Number of notes on which 100% return is given by PNB = $\frac{50}{100} \times 15000$
 = 7500
 Number of notes on which 50% return is given by PNB = $(15000 - 7500) \times \frac{5}{12}$
 = 3125
 Number of notes on which 80% return is given by PNB = $15000 - 7500 - 3125$
 = 4375
 Required amount = $(15000 \times 20) - (7500 \times 20) - (3125 \times 10) - (4375 \times 16)$
 = $300000 - 150000 - 31250 - 70000$
 = Rs.48,750

18. (e): Let number of notes on which PNB gave 50% return and 80% return be $5x$ and $7x$ respectively.
 ATQ,
 $7x - 5x = 1500$
 $x = 750$
 So, number of notes on which PNB gave 100% return = $15000 - (7x + 5x)$
 = $15000 - 12 \times 750$
 = 6000
 Now, number of notes on which Axis bank gave 80% return = $5 \times 750 - 1750$
 = 2000
 So, number of notes on which Axis bank gave 100% return = $10000 - 2000 - 2000 \times \frac{1}{4}$
 = 7500
 Required number of notes = $6000 + 7500$
 = 13500

19. (d): Required ratio = $\frac{2 \times (4 \times 4 + 2 \times 7 + 3)}{2 \times (3 \times 4 + 1 \times 7 + 3)} = \frac{66}{44} = 3 : 2$

20. (a): Let number of classes taken by R in each month of 31 days be x .
 ATQ,
 $(2 \times 4 + 3 + x \times 7) \times 800 = 31,200$
 $\Rightarrow x = 4$
 required number of classes = $4 \times 7 = 28$

21. (e): Required difference = $2 \times 32 \times 600 - 2 \times 33 \times 500$
 = Rs. 5400

22. (b): Total fees paid by R and Q together in that year = $\{25 \times 800 + 32 \times 600\} = \text{Rs } 39,200$
 Total fees paid by P and S together = $(22 \times 700 + 33 \times 500) = \text{Rs } 31,900$
 Required % = $\frac{39200}{31900} \times 100 \approx 123\%$

23. (c): Fees paid by T = Rs. $(3 \times 7 + 3) \times 750 = \text{Rs. } 18,000$
 Fees paid by P (in that year) = Rs. $(3 \times 4 + 3 + 7 \times 1) \times 700 = \text{Rs. } 15,400$
 Required % = $\frac{18000 - 15400}{18000} \times 100 = 14\frac{4}{9}\%$

24. (b): Required ratio = $\frac{6}{2 \times 3 + 2 \times 2} = \frac{6}{10} = 3 : 5$

25. (e): Required no. of classes = $\frac{9 \times 3.78 \times 1,00,000}{54000} = 63$

26. (a): Required difference = $9 \times 6000 \times 3 - 10 \times 4000 \times 2 = \text{Rs. } 82000$

27. (d): Let number of classes taken by B on Thursday and Friday each be x .
 ATQ,
 $(3 \times 3 + 2x) \times 6 \times 8000 = 5,28,000$
 $\Rightarrow x = 1$
 Required % = $\frac{(22 \times 8000 + 20 \times 4000)}{36 \times 6000} \times 100$
 approximately = 120%

28. (c): Honorarium paid to A = Rs. $6 \times 5000 = \text{Rs. } 30,000$
 Honorarium paid to B (in that week) = Rs. $9 \times 8000 = \text{Rs. } 72,000$
 Required % = $\frac{30000}{72000} \times 100 = 41\frac{2}{3}\%$

Sol. (29 - 33):

Day	Quantity of wet waste	Ratio of wet to dry waste	Difference between dry and wet waste. (wet>dry)	Dry waste
Mon	100 kg	5 : 4	20 kg	80 kg
Tue	110 kg	5 : 4	22 kg	88 kg
Wed	99 kg	9 : 7	22 kg	77 kg
Thu	84 kg	7 : 5	24 kg	60 kg
Fri	96 kg	12 : 7	40 kg	56 kg

The above table is formed by calculating all the missing data as per instructions

29. (d): On Wednesday the truck picks only 80% of the waste of his capacity
 Therefore, waste picked on Wednesday = $180 \times \frac{80}{100} = 144 \text{ kg}$
 Quantity of wet waste picked = 99 kg
 Quantity of dry waste picked = $144 - 99 = 45 \text{ kg}$
 Required difference = $99 - 45 = 54 \text{ kg}$

30. (b): As on Thursday, Quantity of wet waste is 84 kg and the difference between wet waste and dry waste is 24 kg (Given)
 Quantity of Dry waste = $84 - 24 = 60 \text{ kg}$
 As in the question, the ratio of wet waste and dry waste is 7 : y (Given)
 ATQ, $\frac{84}{60} = \frac{7}{y}$
 Therefore, $y = \frac{60}{12} = 5$

31. (e): Total dry waste produced on Monday, Tuesday and Friday together = $80 + 88 + 56 = 224 \text{ kg}$
 Total wet waste produced on Wednesday and Thursday together = $99 + 84 = 183 \text{ kg}$
 Required ratio = 224:183

32. (c): Total amount of waste left by the end of the Wednesday = $(180 - 180) + (198 - 180) + (176 - 180)$
 $= (0 + 18 - 4)$
 $= 14 \text{ kg}$

33. (c): Total quantity of dry waste taken on all the 5 days together = $80 + 88 + 77 + 60 + 56 = 361 \text{ kg}$

34. (a): Let total no. of mails received in inbox of K be 'a'.
 Average no. of mails received in inbox by X, Y & K
 $= \frac{750}{100} \times$
(average no. of spam mails received by user X, Y and K)
 $\frac{725 + 840 + a}{3} = \frac{750}{100} \times \left(\frac{88 + 82 + 92}{3} \right)$
 $1565 + a = \frac{750}{100} \times 262$
 $a = 1965 - 1565$
 $a = 400$
 Required total = $400 + 92 = 492$

35. (a): Inbox mails read by user Z = $\frac{125}{100} \times 92 = 115$
 Required % = $\frac{115}{800} \times 100$
 $= 14.375\%$

36. (d): Inbox mails read by user X & Y together
 $= \frac{725}{100} \times 68 + \frac{840}{100} \times 65$
 $= 493 + 546 = 1039$
 Required difference = $1039 - (88 + 82)$
 $= 869 \text{ more}$

37. (e): Total mails received in inbox by K = $3 \times 88 = 264$
 Total mails received by K = $264 + 92 = 356$
 Total no. of inbox mails read by user X =
 $725 \times \frac{68}{100} = 493$
 Required % = $\frac{356}{493} \times 100 \approx 72\%$

38. (d): Inbox mails which are read by user Z
 $= 800 - \frac{250}{100} \times 88 = 580$
 Required average = $\frac{580 + 840 \times \frac{65}{100}}{2}$
 $= \frac{580 + 546}{2} = \frac{1126}{2} = 563$

Sol. (39 - 43):

All applicants who submitted more than one application, their original submission is also rejected.

Total applications rejected = original application of duplicate applicants + duplicate (more than one) application

Total applications received = total original applications + total duplicate applications

FOR POSITION A:

63 applications were declared duplicate since these 63 applicants submitted more than one application

Total rejected applications = $63 + 63 \times 4 = 315$

Following the same, we get

Positi	Total Applicati o n s	Original (accepted) Applications	Duplicate (rejected) Applications
A	1040	725	315
B	880	$880 - 7p$	$7p$
C	600	$600 - 28(q + 1)$	$28(q + 1)$
D	s	$s - 48(r + 1)$	$48(r + 1)$
E	420	$420 - t(u + 1)$	$t(u + 1)$

Where, p = no. of duplicate applications for B

q = average no. of applications from duplicate applicants for C

r = average no. of applications from duplicate applicants for D

S = total no. of applications received for D

t = no. of duplicate applications for E

u = average no. of applications from duplicate applicants for E

39. (d): let accepted & rejected application from males is $5x$ & $3x$ respectively

Let accepted & rejected application from females is $5y$ & y respectively

$$5x + 5y = 725 \dots\dots\dots(i)$$

$$3x + y = 315 \dots\dots\dots(ii)$$

Equating (i) & (ii)

$$x = 85$$

required no. of rejected applications from males =
 $3x = 255$

40. (c): ATQ, $420 - t(u + 1) = X + X + Y \dots\dots\dots(i)$

$$t(u + 1) = X + 2Y \dots\dots\dots(ii)$$

using (i) & (ii)

$$420 = 3(X + Y)$$

$$X + Y = 140 \dots\dots\dots(iii)$$

A. X = 139

This means, $Y = 1$

Since no relation regarding value of Y is given so, this is possible.

Given condition is true.

B. X = 141

Using (iii), X at most can be 140

This condition is not possible

C. X = 131

This means, $Y = 9$

Since no relation regarding value of Y is given so, this is possible.

Given condition is true.

41. (a): $ATQ, 725 + 880 - 7p = 659 \times 2$
Solving, $p = 41$
Required duplicate applications = $7p = 287$

42. (e): $ATQ, \frac{s-48(r+1)}{48(r+1)} = \frac{4}{1}$

$S = 240(r + 1) \dots\dots\dots(i)$

A. Given $s = 240$

This is possible only when $r = 0$ but we know $r > 0$
(average no. of applications cannot be zero since there are applications which were declared duplicate)

This condition is not true.

B. Given $s - 48(r + 1) = 768$

From (i), $240(r + 1) - 48(r + 1) = 768$

$192(r + 1) = 768$

$r = 3$ (average no. of duplicate applications can only be non-zero integer)

this condition is true.

C. least no. of applications were received for D is a possibility.

This is true only if $s < 420$ (since 420 applications were received for E)

$240(r + 1) < 420$

$r + 1 < 1.75$

$r < 0.75$

this is not possible as we know r can only be non – zero integer

So, this condition is not true.

43. (b): let no. of accepted applications from males & females for C be x & y respectively

$150 < x < 200$

$130 < y < 180$

To find, $q = ?$

Applications accepted from all (males + females) for C = $600 - 28(q + 1)$

$600 - 28(q + 1) = x + y \dots\dots\dots(i)$

Minimum possible value of ' $x + y$ ' = $151 + 131 = 282$

Maximum possible value of ' $x + y$ ' = $199 + 179 = 378$

So, $282 \leq x + y \leq 378 \dots\dots\dots(ii)$

Using (i) & (ii)

$282 \leq 600 - 28(q + 1) \leq 378$

On solving above inequality, $222 \leq 28(q + 1) \leq 318$

$\frac{97}{14} \leq q \leq \frac{145}{14}$

Since q can only be non – zero integer

Satisfying values of $q = 7, 9$

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Chapter 03

Pie Graph

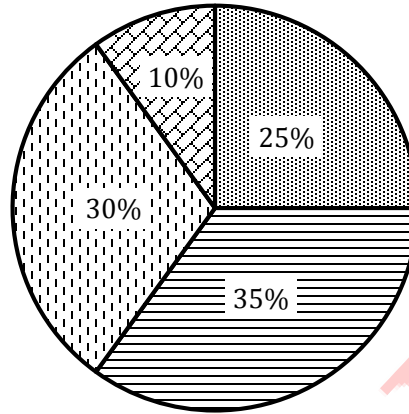
Pie Graph are specific type of data representation where the data is represented in the form of a circle. The circle is divided into various segments or sectors. The circle represents the total value and the different segments or sectors represent certain proportions (degree or percentage value) of the total. The value of each component is in proportion to the circular area representing the component. This chart is used to show the break-up of one variable into its component parts. This chart is less versatile as compared to other representation format like table, bar graph or graph because it can represent only one variable at a time.

This chapter contains:

- Concept with Solved Examples
- Practice MCQs for Prelims
- Practice MCQs for Mains
- Previous Years' Questions of Prelims
- Previous Years' Questions of Mains

Solved Examples

Direction (1 – 5): Pie chart shows income distribution of four earning member of a family out of total family income in the year 2016. Read the data carefully and answer the questions.



■ A ■ B ■ C ■ D

1. If A and C expend 80% and 60% of their income respectively and total saving of both is Rs. 40800, then find the income of C?
 (a) 72000 Rs. (b) 78000 Rs. (c) 54000 Rs. (d) 90000 Rs. (e) 60000 Rs.

Sol. (a); Let total income = $100x$

ATQ –

$$100x \times \left(\frac{25}{100} \times \frac{20}{100} + \frac{30}{100} \times \frac{40}{100} \right) = 40800$$

$$17x = 40800$$

$$x = 2400$$

$$\text{Income of C} = 240000 \times \frac{30}{100} = 72000 \text{ Rs.}$$

2. If income of B and D increased by 20% and 40% in the year 2017 over the previous year, then find the ratio of total income of B & D together in 2016 to that of in 2017?

- (a) 3 : 4 (b) 45 : 56 (c) 45 : 53 (d) 47 : 56 (e) 6 : 7

Sol. (b); Let total income in 2016 = $100n$

$$\text{Total income of B \& D in the year 2016} = 100n \times \left(\frac{35}{100} + \frac{10}{100} \right) = 45n$$

$$\text{Total income of B \& D in the year 2017} = 100n \times \left(\frac{35}{100} \times \frac{120}{100} + \frac{10}{100} \times \frac{140}{100} \right) = 56n$$

$$\text{Required ratio} = \frac{45n}{56n} = 45 : 56$$

3. If expenditure of A and B is same, then find difference between saving of A and B is what percent of income of D?

- (a) 112% (b) 125% (c) 150% (d) 100% (e) 80%

Sol. (b); Let total income = $100b$

And total expenditure of each A & B be 'E'

ATQ –

$$\text{Required percent} = \frac{(35b - E) - (25b - E)}{10b} \times 100$$

$$= \frac{10b}{10b} \times 100 = 100\%$$

4. If difference between income of A & D is Rs. 30000 in 2016 and income of B & C increased by 40% and 20% respectively in the year 2017 over 2016, then find difference between income of B & C in the year 2017?
 (a) 24000 Rs. (b) 26000 Rs. (c) 20000 Rs. (d) 28000 Rs. (e) 32000 Rs.

Sol. (b): Let total income = $100x$

ATQ –

$$25x - 10x = 30000$$

$$x = 2000$$

$$\text{Required difference} = 200000 \left(\frac{35}{100} \times \frac{140}{100} - \frac{30}{100} \times \frac{120}{100} \right) = 26000 \text{ Rs.}$$

5. What will be central angle for income of A & D together?

(a) 128° (b) 136° (c) 126° (d) 144° (e) 120°

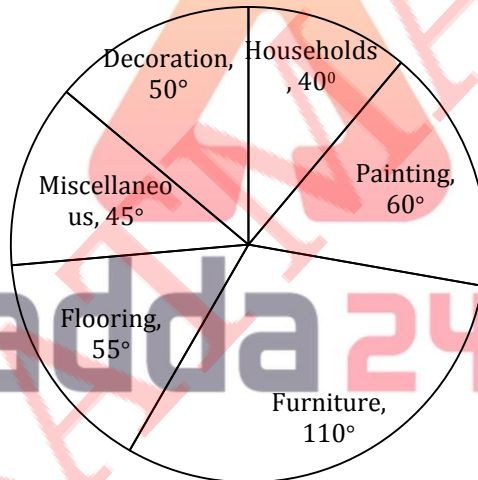
Sol. (b): Let total income = $100x$

Total income of A & D = $35x$

$$\text{Required angle} = \frac{35x}{100x} \times 360 = 126^\circ$$

Directions (6-10): Study the following pie chart and answer the questions that follow it
 Given below is the pie chart which shows the distribution of expenditure of a man in degree.

Total Expenditure of 2017 = 2,50,000



6. Expenditure on household and flooring is what percent of the total expenditure (approximately)?

(a) 26% (b) 36% (c) 20% (d) 22% (e) 24%

Sol. (a): Central angle of household and flooring together = $40^\circ + 55^\circ = 95^\circ$

Overall central angle = 360°

$$\therefore \text{percentage of income spend on household and flooring together} = \frac{95^\circ}{360} \times 100\% = 26.33 \approx 26\%$$

7. What is the ratio of expenditure on miscellaneous and painting together to the expenditure on flooring and furniture together?

(a) 33 : 21 (b) 7 : 11 (c) 7 : 8 (d) 23 : 31 (e) 11 : 7

Sol. (b): Angle of miscellaneous and painting together = $45^\circ + 60^\circ = 105^\circ$

Angle of flooring and furniture together = $55^\circ + 110^\circ = 165^\circ$

$$\therefore \text{ratio} = \frac{105^\circ}{165^\circ} = \frac{7}{11}$$

8. What is difference between the expenditure on decoration and furniture together to the expenditure on households?

(a) Rs 83,333.33 (b) Rs 84,333.33 (c) Rs 86,333.33 (d) Rs 82,333.33 (e) Rs. 85333.33

Sol. (a); Angle of decoration & furniture together = $50 + 110 = 160^\circ$

Angle of household = 40°

Difference of angle = $160^\circ - 40^\circ = 120^\circ$

\therefore expenditure = $\frac{120^\circ}{360^\circ} \times 250,000 = \text{Rs } 83,333.333$

9. If expense on painting is Rs 30,000 in 2018 then what is the percentage of expenditure on painting to total expenditure if total expenditure remains the same?

- (a) 10% (b) 16% (c) 12% (d) 18% (e) 15%

Sol. (c); Expenditure on painting = Rs 30,000

Total expenditure = Rs 2,50,000

\therefore Percentage of expenditure on painting to total = $\frac{30,000}{2,50,000} \times 100 = 12\%$

10. If the expenditure on each decoration & household is increased by 20% in 2018, then what is the total expenditure on decoration and household in 2018?

- (a) Rs 63,500 (b) Rs 62,500 (c) Rs 75,000 (d) Rs 66,500 (e) None of these

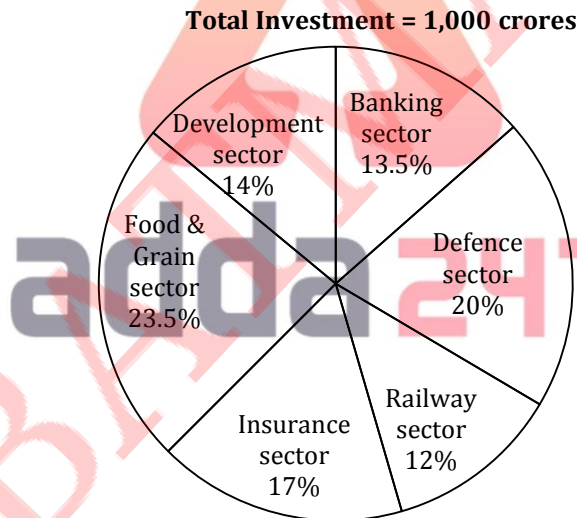
Sol. (c); Angle of decoration & household together = 90°

Expenditure on decoration and household together in 2017 = $\frac{90^\circ}{360^\circ} \times 2,50,000 = \text{Rs } 62,500$

For 20% increase = $62,500 \times \frac{20}{100} = \text{Rs } 12,500$

\therefore Total expenditure on decoration and household in 2018 = $62,500 + 12,500 = 75,000$

Directions (11-15): Pie-chart given below shows the investment of a government entity (in crore) in different sectors. Study the pie-chart and answer the following.



11. What is the ratio of average investment on banking and defense sector to the average investment on insurance, railway and development sector.

- (a) 172 : 201 (b) 201 : 172 (c) 67 : 86 (d) 86 : 67 (e) 65 : 86

Sol. (b); Average investment on Banking and defence = $\frac{135+200}{2} = \frac{335}{2}$ crore

Average investment on Insurance, Railway & Development = $\frac{170+120+140}{3} = \frac{430}{3}$ crore

Desired Ratio = $\frac{\frac{335}{2}}{\frac{430}{3}} = \frac{335}{2} \times \frac{3}{430} = \frac{201}{172}$

12. What is the percentage of investment in banking sector to the investment in Railway sector:

- (a) 110% (b) 114% (c) 112% (d) 116% (e) None of these

Sol. (e); Desired% = $\frac{135}{120} \times 100 = 112.5\%$

13. What is the central angle for Food and Grain sector ?

- (a) 84° (b) 84.2° (c) 84.4° (d) 84.6° (e) 84.8°

Sol. (d); $\text{Investment on Food \& Grain in \%} = \frac{235}{1000} = 23.5\%$

$$\text{In Central Angle} = 23.5 \times \frac{18}{5} = 84.6^\circ$$

14. If the investment in Railway and Defence sector is increases by 15% and 25% respectively then how much percentage increase in total investment(in percentage) ?

- (a) 6.8% (b) 7% (c) 7.2% (d) 6.6% (e) 6.4%

Sol (a); $\text{Increase in Railway} = 120 \times \frac{15}{100} = 18 \text{ Crore}$

$$\text{Increase in defence} = 200 \times \frac{25}{100} = 50 \text{ Crore}$$

Total Increase = 68 Cr.

$$\text{Desired \%} = 68/1000 \times 100 = 6.8\% \text{ increase}$$

15. If the government reduces the investment on Defence sector by 20% and distributed this money on Railway and insurance sector in the ratio 5 : 3 then investment in insurance sector changes by what percentage ?(approximately).

- (a) 8% decrease (b) 8.8% increase (c) 10.2% increase
(d) 11% increase (e) 10.5% decrease

Sol. (b); $\text{Reduction on Defence sector} = 200 \times \frac{20}{100} = 40 \text{ Crore}$

Investment in Railway and Insurance sector be $5x$ and $3x$ respectively

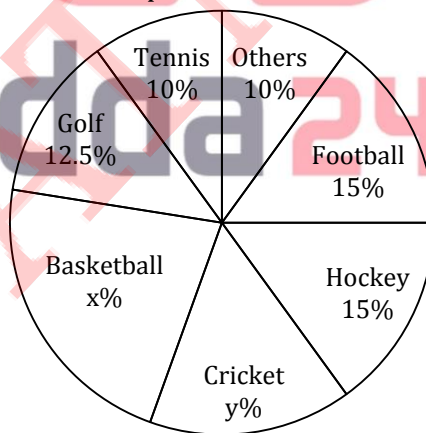
$$\text{Total} = 8x = 40 \Rightarrow x = 5$$

$$\text{Increase in Insurance sector} = 3 \times 5 = 15 \text{ Crore}$$

$$\text{Effect on insurance sector} = \frac{15}{170} \times 100 \approx 8.8\% \text{ increase}$$

Directions (16-20): Given below is the pie chart which shows the percentage expenditure issued by government on different sports in a state in year 2016

Total Expenses = 500 Lakhs



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16. What is the ratio of expenditure on Football and Golf together to the expenditure on Hockey and Tennis together ?

- (a) 11 : 10 (b) 9 : 10 (c) 10 : 11 (d) 11 : 12 (e) 5 : 6

Sol. (a); $\text{Required ratio} = \frac{\frac{27.5}{100} \times 500}{\frac{25}{100} \times 500} = \frac{275}{250} = 11 : 10$

17. What is the difference between average of expenditure on sports Golf, Football together to the average of expenditure on sport tennis and Hockey together ?

- (a) 4.25L (b) 10.25L (c) 6.25L (d) 5.5L (e) 7.25L

Sol. (c); $\text{Average expenditure on football and Golf together} = \frac{27.5 \times 5}{2} = 68.75$

$$\text{Average of expenditure Tennis and Hockey} = \frac{25 \times 5}{2} = 62.5$$

$$\text{Required difference} = 6.25 \text{ L}$$

18. If in year 2017 expenditure on Cricket and basketball increases by 20% and 12% than the previous year respectively and ratio of expenditure between these two sports in 2016 is 2 : 1 then find the total expenditure of these two sports in 2017.

(a) 180 L (b) 310 L (c) 285 L (d) 220 L (e) 170 L

Sol. (d); Expenditure on Cricket in 2016 = $\left\{ \frac{(100\% - 62.5\%) \times 500}{3} \right\} \times 2$

$$\frac{37.5 \times 5}{3} \times 2 = 12.5 \times 5 \times 2 = 125 L$$

$$\text{Expenditure on Basketball in 2016} = \frac{37.5 \times 5}{3} = 12.5 \times 5 = 62.5 L$$

$$\text{Required expenditure in 2017} = \frac{120}{100} \times 125 + \frac{112}{100} \times 62.5 = 150 + 70 = 220$$

19. If expenditure on football and Hockey increases 20% and 25% in 2017 than that in 2016 respectively then what is the total expenditure for these two sports in 2017?

(a) 120.65 L (b) 170.50 (c) 183.75 (d) 190.00 (e) 201.5

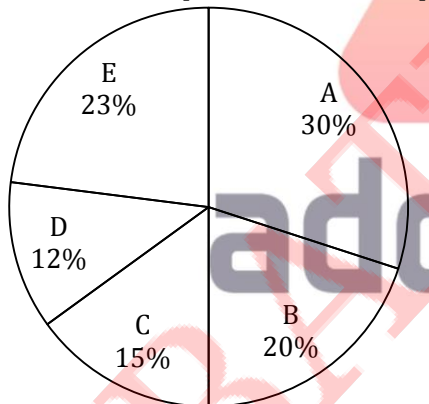
Sol. (c); Required expenditure = $15 \times 5 \times \frac{120}{100} + 15 \times 5 \times \frac{125}{100}$
 $= 90 + 93.75 = 183.75$

20. Total expenditure of Tennis and football together in 2016 is what percent of total expenditure on all, sports in 2017 if in 2017 expenditure on all sports increases by 20% than that in 2016?

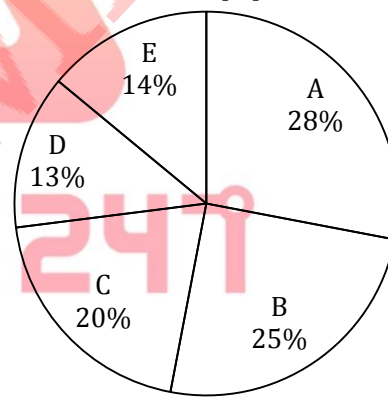
(a) $20\frac{5}{6}\%$ (b) $30\frac{2}{3}\%$ (c) $13\frac{7}{9}\%$ (d) $14\frac{2}{7}\%$ (e) $16\frac{2}{3}\%$

Sol. (a); Required percentage = $\frac{(10\% + 15\%)500}{120\% \times 500} \times 100 = 20\frac{5}{6}\%$

Directions (21-25): Given below are two pie charts, first pie chart shows the percentage distribution of total population of five cities in 2016 and second pie chart shows the percentage distribution of male population in these five cities in 2016



Population of five cities in 2016
Total population 6,00,000



Male population of five cities in 2016
Total population = 4,00,000

21. What is the total number of females in city C and E together?

(a) 1,00,000 (b) 98,000 (c) 96,000 (d) 94,000 (e) 92,000

Sol. (e); Total population in city C and E = 38% of 6,00,000 = 2,28,000
 Total male population in city C and E = 34% of 4,00,000 = 1,36,000
 Total no. of females in city C and E = 2,28,000 - 1,36,000 = 92,000

22. What is the ratio between males in city B and D together to females in city A and B together?

(a) 11 : 7 (b) 7 : 11 (c) 11 : 14 (d) 19 : 11 (e) 14 : 9

Sol. (d); Males in B and D together = 38% of 4,00,000 = 1,52,000
 Total population in A and B = 50% of 6,00,000 = 3,00,000
 Total male population in city A and B = 53% of 4,00,000 = 2,12,000
 Total female population in A and B in = 88,000
 Ratio = $\frac{1,52,000}{88,000} = \frac{19}{11}$

23. If in 2017, population of city D and C increases by 10% and 15% respectively over previous year and the male population is increased by 15% and 20% respectively over previous year, then find the ratio between number of females in city D to number of females in city C in year 2017?

(a) 191 : 75 (b) 75 : 194 (c) 194 : 75 (d) 75 : 191 (e) None of these

Sol. (c); Population of D in 2017 = $6,00,000 \times \frac{12}{100} \times \frac{110}{100} = 79,200$

$$\text{Male population of D in 2017} = 4,00,000 \times \frac{13}{100} \times \frac{115}{100} = 59,800$$

$$\text{Female population in D in 2017} = 79,200 - 59,800 = 19,400$$

$$\text{Population of C in 2017} = 6,00,000 \times \frac{15}{100} \times \frac{115}{100} = 1,03,500$$

$$\text{Male population in C in 2017} = 4,00,000 \times \frac{20}{100} \times \frac{120}{100} = 96,000$$

$$\text{Female population in C in 2017} = 1,03,500 - 96,000 = 7500$$

$$\text{Ratio} = \frac{19,400}{7,500} = \frac{194}{75}$$

24. What was the population of city C in 2014, if population increase at the rate of 20% annually.

(a) 62,000 (b) 62,500 (c) 63,000 (d) 64,000 (e) 64,500

Sol. (b); Let, population in city C in 2014 = x

$$x \times \left[1 + \frac{20}{100}\right] \left[1 + \frac{20}{100}\right] = 6,00,000 \times 15\%$$

$$x \times \frac{120}{100} \times \frac{120}{100} = 90,000 \Rightarrow x = 62,500$$

25. Number of females in city C is how much percent more or less than the males in City D [approximately]?

(a) 19% less (b) 81% more (c) 81% less (d) 19% more (e) 27% more

Sol. (c); No. of females in city C = $6,00,000 \times \frac{15}{100} - 4,00,000 \times \frac{20}{100} = 90,000 - 80,000 = 10,000$

$$\text{No. of males in D} = 13\% \times 4,00,000 = 52,000$$

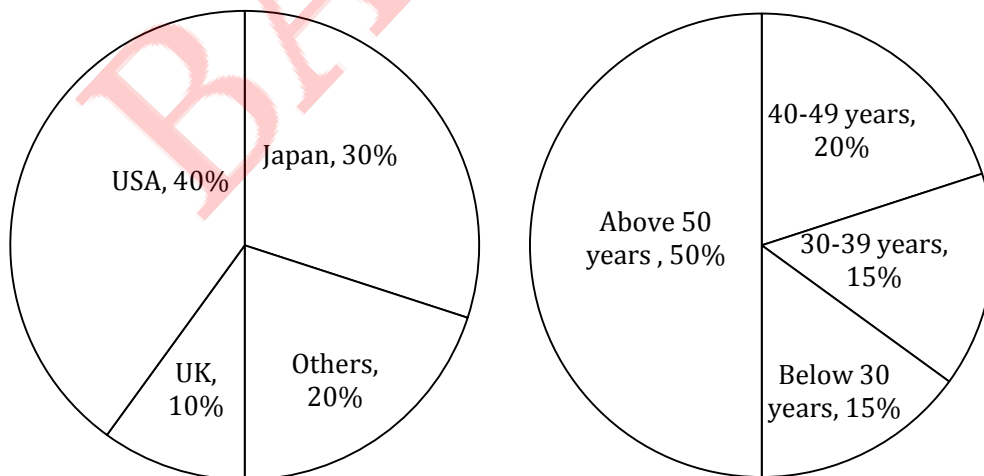
$$\% = \frac{52,000 - 10,000}{52,000} \times 100 = \frac{42,000}{52,000} \times 100 = 80.77\% \approx 81\%$$

No. of females in city C is 81% less than the number of males in city D.

Direction (26-30)- Study the given pie charts and answer the following questions.

In the first pie chart distribution of overseas tourist traffic from India to different countries is given and in the second pie chart distribution of overseas tourist traffic from India according to age wise is given.

Distribution of Overseas Tourist Traffic from India



26. If the tourist traffic from India to USA is 165000 more than that of UK then overseas tourist traffic in the age group of (40-49) years are how much (in lakh) more/less than the overseas traffic from India in the age group of (30 - 39) years?

(a) 0.725 lakh (b) 0.275 lakh (c) 0.55 lakh (d) 0.527 lakh (e) 0.42 lakh

Sol. (b); Given

$$30\% \rightarrow 165000$$

$$1\% \rightarrow 5500$$

$$100\% \rightarrow 550000$$

$$\therefore \text{Total overseas tourist from India} = 550,000$$

Then,

$$(20 - 15) = 5\% \text{ of } 550,000 = 5 \times 5500 = 27500 = 0.275 \text{ lakh}$$

27. The ratio of the number of Indian tourists that went to USA to the number of Indian tourists who were below 40 years of age is :

(a) 2 : 1

(b) 8 : 3

(c) 3 : 8

(d) Cannot be determined (e) 4 : 3

Sol. (e); Required Ratio = $\frac{40}{15+15} = \frac{40}{30} = 4 : 3$

28. If amongst other countries, Switzerland, accounted for 25% of the Indian tourist traffic, and it is known from official Swiss records that a total of 25 lakh Indian tourists had gone to Switzerland during the year, then find the number of 30-39-year-old Indian tourists who went abroad in that year.

(a) 18.75 lakh

(b) 25 lakh

(c) 50 lakh

(d) 75 lakh

(e) 80 lakh

Sol. (d); 25% → 25 lakh

$$100\% \rightarrow 100 \text{ lakh}$$

$$\therefore \text{total overseas tourist from India} = \frac{100}{20} \times 100 = 500 \text{ lakh}$$

$$\text{Then required no. of overseas tourist} = \frac{15}{100} \times 500 = 75 \text{ lakh}$$

29. If amongst other countries, Switzerland, accounted for 25% of the Indian tourist traffic, and it is known from official Swiss records that a total of 25 lakh Indian tourists had gone to Switzerland during the year, then what was the volume of traffic of Indian tourists in the US?

(a) 150 lakh

(b) 125 lakh

(c) 200 lakh

(d) 225 lakh

(e) 230 lakh

Sol. (c); Total overseas Indian tourist = 500 lakh

$$\therefore \text{Required No. of tourist} = \frac{40}{100} \times 500 = 200 \text{ lakh}$$

30. If tourist of age group above 50 years are 3.6 lakh more than the tourist of age group 40-49 years then what is the total no. tourist of age below 40 years?

(a) 4.8 lakh

(b) 4.2 lakh

(c) 3.6 lakh

(d) 4.5 lakh

(e) 3.2 lakh

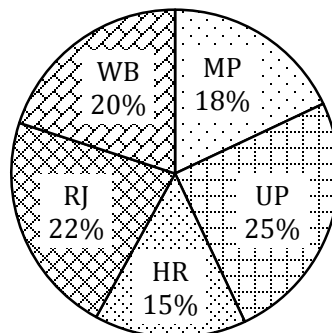
Sol. (c); 30% → 3,60,000

$$100\% \rightarrow \frac{3,60,000}{30} \times 100$$

$$\rightarrow 12,00,000$$

$$\therefore \text{Required answer} = \frac{15+15}{100} \times 12,00,000 = 3.6 \text{ lakh}$$

Directions(31-35):- Pie chart given below gives information about percentage of people who are below poverty line and live in urban area of five different states i.e. MP, UP, RJ, HR and WB. In MP, RJ and WB, 60% of total population who are below poverty line lives in urban area while in HR and UP, 60% of total population who are below poverty line lives in rural area. Total population of these five states which is below poverty line and lives in urban area is 4.5 lakh.



□ MP □ UP □ HR □ RJ □ WB

31. If 45% of Total population of HR is below poverty line. Then find no. of people who are below poverty line and live in rural area in WB is what percent of total population of HR.

- (a) 10% (b) 22% (c) 12% (d) 16% (e) 18%

Sol. (d); Population of HR who lives in urban area and is below poverty line = $450000 \times \frac{15}{100} = 67500$

$$\text{Total population of HR which is below poverty line} = \frac{67500}{40} \times 100 = 168750$$

$$\text{Total population of HR} = \frac{168750}{45} \times 100 = 375000$$

$$\text{population of WB who lives in rural area and is below poverty line} = 450000 \times \frac{20}{100} \times \frac{40}{60} = 60000$$

$$\text{required percentage} = \frac{60000}{375000} \times 100 = 16\%$$

32. Find difference between population of RJ who lives in rural area and is below poverty line and population of MP who is below poverty line and lives in Urban area.

- (a) 15000 (b) 17000 (c) 28000 (d) 25000 (e) 27000

Sol. (a); population of RJ who lives in rural area and is below poverty line

$$= 450000 \times \frac{22}{100} \times \frac{40}{60} = 66000$$

$$\text{population of MP who lives in urban area and is below poverty line} = 450000 \times \frac{18}{100} = 81000$$

$$\text{required difference} = 81000 - 66000 = 15000$$

33. If in UP 72% of rural population is below poverty line and total 2,65,625 people lives in urban area, then find total population of UP.

- (a) 400000 (b) 500000 (c) 300000 (d) 800000 (e) 700000

Sol. (b); population of UP who lives in rural area and is below poverty line

$$= 450000 \times \frac{25}{100} \times \frac{60}{40} = 168750$$

$$\text{Total population of UP who lives in rural area} = \frac{168750}{72} \times 100 = 234375$$

$$\text{Total population of UP} = 234375 + 265625 = 500000$$

34. Total no. of people who are below poverty line in RJ are how much percent more or less than that of MP.

- (a) 11.11% (b) 12.5% (c) 9.09% (d) 9.99% (e) 22.22%

Sol. (e); population of RJ which is below poverty line = $450000 \times \frac{22}{100} \times \frac{100}{60} = 165000$

$$\text{Population of MP which is below poverty line} = 450000 \times \frac{18}{100} \times \frac{100}{60} = 135000$$

$$\text{Required percentage} = \frac{165000 - 135000}{135000} = 22.22\%$$

35. If 37.5% population of WB is above poverty line, then find ratio of total population of WB to total people who are below poverty line and living in urban area in all five states.

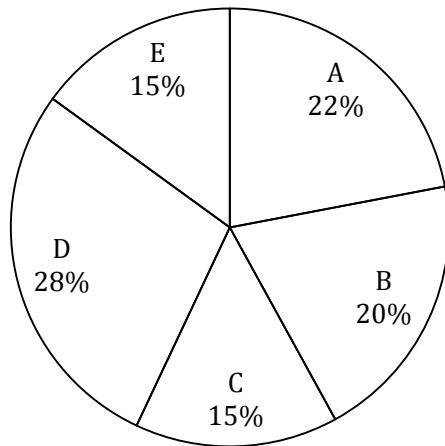
- (a) 8:15 (b) 2:3 (c) 1:5 (d) 13:15 (e) 3:5

Sol. (e); population of WB which is below poverty line = $450000 \times \frac{20}{100} \times \frac{100}{60} = 150000$

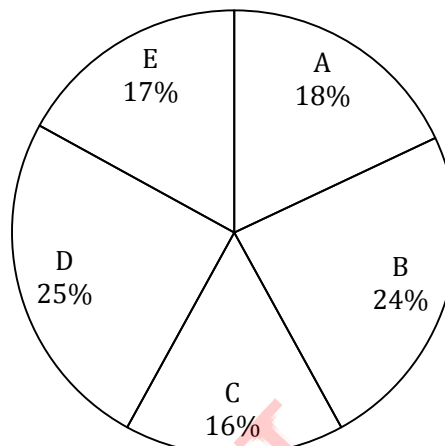
$$\text{Total population of WB} = \frac{150000}{62.5} \times 100 = 240000$$

$$\text{Required ratio} = \frac{240000}{150000} = \frac{8}{5} = 8:5$$

Directions (36-40): In the following pie-chart Income and expenses of five employees is given. Read the given data & answer the following questions.



Net Income = 4,00,000



Net Expense = 3,00,000

Note- Income = expenditure + saving

36. What is the average saving of B and C together?

- (a) 8,000 (b) 9,000 (c) 10,000 (d) 11,000 (e) 12,000

Sol. (c); Income of B = $\frac{20}{100} \times 4 \text{ Lakh} = 80,000$

Expenses of B = $\frac{24}{100} \times 3 \text{ Lakh} = 72,000$

Saving of B = 8,000

Income of C = $\frac{15}{100} \times 4,00,000 = 60,000$

Expenses of C = $\frac{16}{100} \times 3,00,000 = 48,000$

Saving of C = 12,000

Average of saving = $\frac{12,000+8,000}{2} = 10,000$

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37. If Income of Employee A decreases by 10% and its expenses increase by 20%. Then, his saving changes by what percent? (approximately)

- (a) 42% (b) 50% (c) 58% (d) 62% (e) 68%

Sol. (c); Income of A = $\frac{22}{100} \times 4,00,000 = 88,000$

Expense of A = $\frac{18}{100} \times 3,00,000 = 54,000$

Present saving of A = 34,000

Income after decrement = $88,000 \times \frac{90}{100} = 79,200$

Expenses after increment = $54,000 \times \frac{120}{100} = 64,800$

Saving after changes = 14,400

% changes in saving = $\frac{34,000-14,400}{34,000} \times 100 = 57.64\% \approx 58\%$

38. If the income of D increases by 10% and income of E decreases by 20% then what will be the effect on net income of five employees?

- (a) Rs. 800 increase (b) Rs. 1000 Increase (c) Rs. 1000 decrease (d) Rs. 800 decrease (e) None of these

Sol. (d); Changes in D's salary = $\frac{28}{100} \times 4,00,000 \times \frac{10}{100} = 11,200$ (↑)

Changes in E's salary = $\frac{15}{100} \times 4,00,000 \times \frac{20}{100} = 12,000$ (↓)

Effect on Net Income = Rs. 800 (↓) = Rs. 800 decrease

39. What is the ratio of saving of A to B ?

- (a) 17 : 4 (b) 4 : 17 (c) 17 : 15 (d) 15 : 17 (e) 12 : 7

Sol. (a); Saving of B = 8,000 [see question 1]

Saving of A = 34,000 [see question 2]

$$\text{Ratio} = \frac{34,000}{8,000} = \frac{17}{4}$$

40. If expenses of C increase by 15% then to how much percentage of increment is necessary in his income to keep his saving same as before?

- (a) 10% (b) 12% (c) 15% (d) 8% (e) 6%

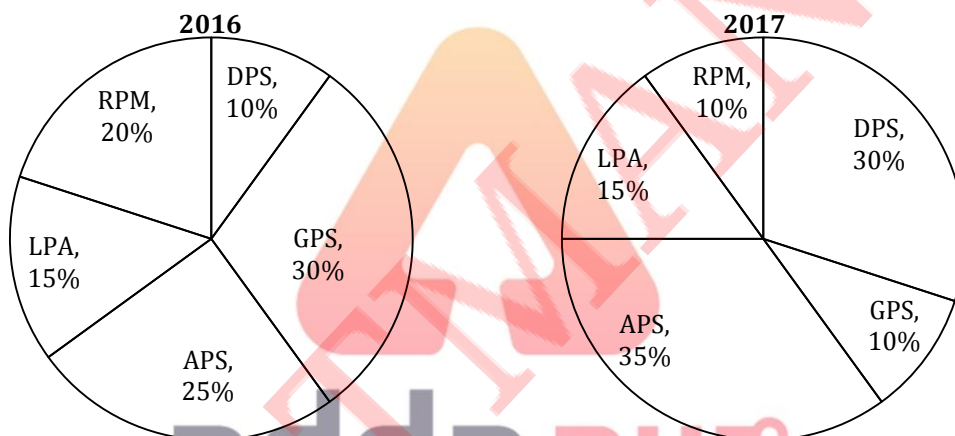
Sol. (b); Expenses of C = $\frac{16}{100} \times 3,00,000 = 48,000$

$$\text{Increment in expense} = 48,000 \times \frac{15}{100} = 7200$$

$$\% \text{ increment necessary on salary} = \frac{7200 \times 100}{15\% \times 4,00,000} = \frac{7200 \times 100}{60,000} = 12\% \Rightarrow 12\% \text{ increment}$$

Directions (41-45): Study the following pie-chart and answer the questions that follow it.

Given below are the two pie charts which shows the percentage distribution of admission of students in five different schools in year 2016 and 2017.



41. Total number of admissions in 2016 and 2017 are 2000 and 2500 respectively. Number of students in DPS in 2016 is what percent less or more than number of students in GPS in 2017?

- (a) 35% (b) 25% (c) 40% (d) 20% (e) 15%

Sol. (d); Number of students in DPS in 2016 = $\frac{10}{100} \times 2000 = 200$

$$\text{Number of students in GPS in 2017} = \frac{10}{100} \times 2500 = 250$$

$$\therefore \text{Percentage} = \frac{250-200}{250} \times 100 = \frac{50}{250} \times 100 = 20\%$$

42. If the total number of students in 2016 is 4000 and ratio of boys and girls in RPM is 2 : 3. Then the difference between boys and girls in APS is?

- (a) 500 (b) 600 (c) Cannot be determined (d) 400 (e) 160

Sol. (c); Since ratio of number of boys and girls in 2016 in APS is not given.

43. If the total number of admissions in 2017 is 5000 and 500 students left DPS in 2017 and taken admission in RPM in 2017 then number of admissions in RPM increases by what percent?

- (a) 80% (b) 100% (c) 120% (d) 60% (e) 10%

Sol. (b); Number of students in DPS in 2017 = $\frac{30}{100} \times 5000 = 1500$

$$\text{Number of students in DPS in 2017 after 500 left} = 1500 - 500 = 1000$$

$$\text{Number of students in RPM in 2017} = \frac{10}{100} \times 5000 = 500$$

$$\text{Number of students after 500 students joined} = 500 + 500 = 1000$$

$$\therefore \text{Percentage increase} = \frac{500}{500} \times 100 = 100\%$$

44. If total student taking admission in 2017 is 6000 and in 2016 is 4000. Then find the ratio of total student taking admission in RPM and LPA in 2016 and total student taking admission in GPS and LPA in 2017?

(a) 14 : 15 (b) 15 : 14 (c) 12 : 14 (d) 12 : 15 (e) 13 : 15

Sol. (a); Total student taking admission in RPM and LPA in 2016 = $\frac{20}{100} \times 4000 + \frac{15}{100} \times 4000$
 $= 800 + 600 = 1400$

Total student taking admission in GPS and LPA in 2017 = $\frac{10}{100} \times 6000 + \frac{15}{100} \times 6000$
 $= 600 + 900 = 1500$

Therefore, ratio = $\frac{1400}{1500} = 14 : 15$

45. If total student taking admission in 2016 and 2017 is 8000 and 10,000 respectively. And number of boys in GPS is 400 in 2016 and number of girls in DPS in 2017 is 1000. Then find the ratio of number of girls in GPS in 2016 to the number of boys in DPS in 2017 is?

(a) 1 : 2 (b) 2 : 1 (c) 1 : 3 (d) 1 : 4 (e) 1 : 1

Sol. (e); Total number of students in GPS in 2016 = $\frac{30}{100} \times 8000 = 2400$

Number of girls in GPS in 2016 = $2400 - 400 = 2000$

Total number of students in DPS in 2017 = $\frac{30}{100} \times 10,000 = 3000$

Number of boys in DPS in 2017 = $3000 - 1000 = 2000$

\therefore Ratio = $\frac{2000}{2000} = 1 : 1$

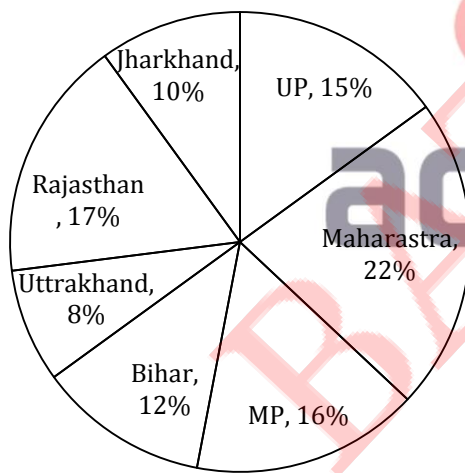
Directions (46-50): Study the following table carefully and answer the questions given below

Ist pie chart shows distribution of candidates applied for NIACL Assistant exam 2017 from 7 different states.

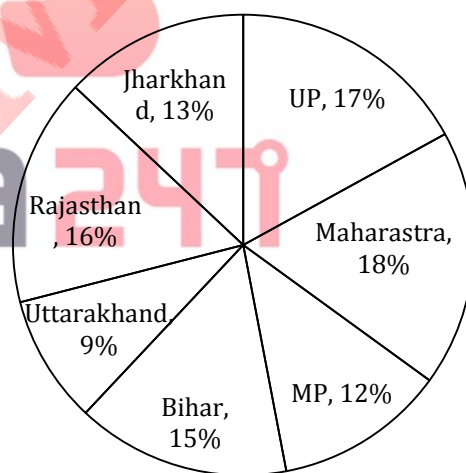
IInd pie chart shows distribution of candidates who qualified the NIACL assistant pre exam from these 7 states.

Total applied candidates from these seven states = 7,50,000 Candidates who qualified pre exam = 38000

Pie Chart I



Pie chart II



46. What percentage of candidates applied from Maharashtra state have qualified the pre exam of NIACL assistant (approximately)

(a) 8% (b) 10% (c) 7% (d) 4% (e) 6%

Sol. (d); Number of candidates applied from Maharashtra state = $22 \times 7500 = 165,000$

Number of candidates qualified = $18 \times 380 = 6840$

Required percentage = $\frac{6840}{165000} \times 100 \approx \frac{680}{165} \approx 4\%$

47. What is the difference between total number of failed candidates from state MP and Bihar together and the failed candidates from state Maharashtra and Jharkhand together. (Consider all candidates who have applied have given exam.)

(a) 30383 (b) 28480 (c) 25680 (d) 19720 (e) 12320

Sol. (b); Candidates failed from MP = $16 \times 7500 - 12 \times 380 = 120,000 - 4560 = 115440$
 Candidate failed from Bihar = $12 \times 7500 - 15 \times 380 = 90,000 - 5700 = 84300$
 Total failed from MP and Bihar = $115440 + 84300 = 199740$
 Candidates failed from Maharashtra = $22 \times 7500 - 18 \times 380 = 165000 - 6840 = 158160$
 Candidate failed from Jharkhand = $10 \times 7500 - 13 \times 380 = 75000 - 4940 = 70060$
 Total failed from Maharashtra and Jharkhand = $158160 + 70060 = 228220$
 Required difference = $228220 - 199740 = 28480$

48. 15% of candidates who have applied from state Rajasthan did not appear for the exam then what percent of the appeared candidates from Rajasthan pass the exam. (Approximately)
 (a) 3% (b) 5.6% (c) 8% (d) 10% (e) 12%

Sol. (b); Candidate passed from Rajasthan = $16 \times 380 = 6080$

Appeared candidates = $\frac{85}{100} \times 17 \times 7500 = 108375$

Required percentage = $\frac{6080}{108375} \times 100 \approx \frac{610}{108} \approx 5.6\%$

49. If ratio of male to female who applied from state UP is 7 : 5 and ratio of male to female candidates who qualified the pre exam from state UP is 2 : 3 then what is the number of female who failed in the exam (Consider all candidates who have applied have appeared for the exam.)

(a) 42999 (b) 53620 (c) 41200 (d) 39500 (e) 24242

49. (a); Total females who have applied from UP = $15 \times 7500 \times \frac{5}{12} = 46875$

Total qualified females from UP = $17 \times 380 \times \frac{3}{5} = 3876$

Total failed female candidates from UP = $46875 - 3876 = 42999$

50. What is the difference between the central angle of candidates who applied from state Uttarakhand and Jharkhand and the central angle of candidates who qualified exam from Maharashtra and Bihar?

(a) 58° (b) 60° (c) 48° (d) 38° (e) 54°

Sol. (e); Central angle for state Uttarakhand and Jharkhand for applied candidates = $\frac{18 \times 18}{5} = \frac{324}{5} = 64.8$

Central angle for qualified candidates from state Maharashtra and Bihar = $\frac{18 \times 33}{5} = 118.8^\circ$

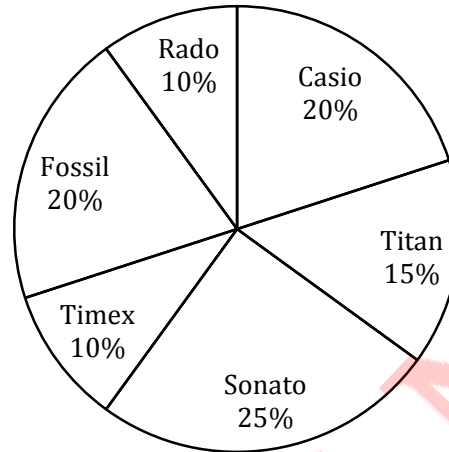
Required difference = $118.8 - 64.8 = 54^\circ$

The advertisement features a blue background with a woman's face. On the left, the Adda247 logo is shown above the text "Govt. jobs' coaching, now in your Pocket!". Below this, it says "Download the Adda247 App and boost your preparation." with a "GET IT ON Google Play" button. On the right, a smartphone displays the app's interface, which includes a "BANKING" header, a banner for "IBPS RRB with BRAND-NEW LIVE BATCH", and a section titled "Find Products by Exam" listing IBPS PO, IBPS RRB, SBI PO, SBI Clerk, EPFO, and IIBF JAIIB. At the bottom of the phone screen, it says "Browse by Product".

Practice MCQs for Prelims

Directions (1-5):- Given pie graph shows percentage distribution of watches manufactured by a company in 2018. Study the graph carefully & answer the questions.

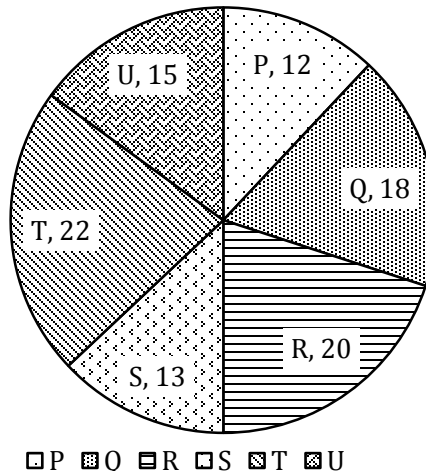
Total watches manufactured = 1000



- What is average of watches manufactured by Casio, Titan & Sonata together?
(a) 500 (b) 600 (c) 400 (d) 200 (e) 300
- What is ratio of watches manufactured by Timex & Sonata together to that by Fossil & Casio together?
(a) 5:4 (b) 8:7 (c) 7:8 (d) 7:4 (e) 5:8
- Watches manufactured of Sonata are what percent more/less than watches manufactured of Rado?
(a) 130% (b) 150% (c) 200% (d) 170% (e) 100%
- If next year, Titan watch production increases by 10% while that of Timex decreases by 10%. What is difference in manufacturing of both in next year?
(a) 80 (b) 90 (c) 100 (d) 65 (e) 75
- No. of watches manufactured of how many brands is more than average no. of watches manufactured?
(a) 4 (b) 3 (c) 1 (d) 2 (e) 5

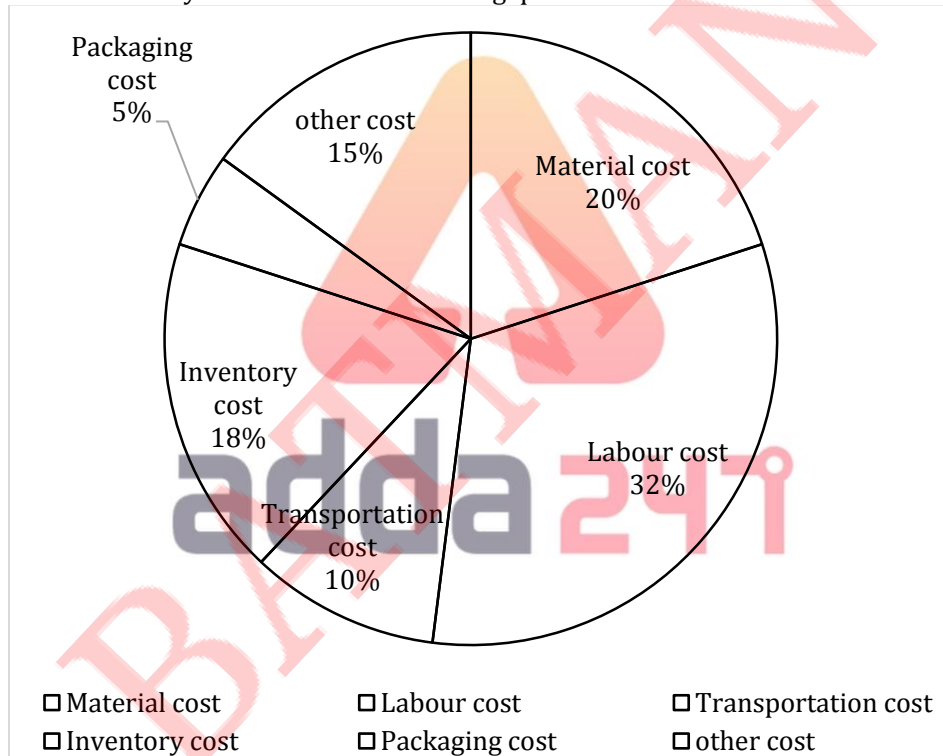
Directions (6-10): pie chart given below gives information about distribution of voters in six different cities out of total voters.

Percentage distribution of voters in six different cities
total voters = 75000



6. Average no. of voters in city P, Q, and U are equal to total no. of voters of which city?
 (a) P (b) Q (c) S (d) T (e) U
7. If 90% and 88% of total voters of city R and T respectively voted on the day of voting, then find no. of voters who did not vote in these two cities?
 (a) 3480 (b) 2280 (c) 2440 (d) 2240 (e) 3280
8. What is the difference between total voters of city P and S together to total voters of city Q and T together?
 (a) 11250 (b) 9750 (c) 9000 (d) 16500 (e) 15000
9. If ratio of male voters to female voters in city S and city U is 13:12 and 29:16 respectively, then find difference between no. of male voters in these cities?
 (a) 2050 (b) 2180 (c) 3400 (d) 3140 (e) None of these.
10. If in city T 40% of total voters are female and 20% of female voters did not cast vote and total 13840 vote were polled, then find how difference of male and female who did not cast vote?
 (a) 20 (b) 40 (c) 25 (d) 15 (e) 38

Direction (11 – 15): The following pie chart shows the percentage distribution of the expenditure incurred in production of a car. Study the pie chart carefully and answer the following questions.

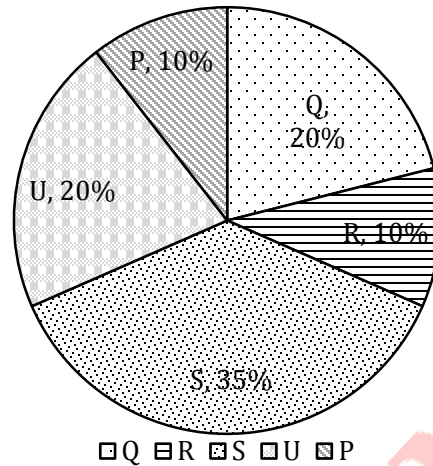


11. What is the central angle of the expenditure incurred on Transportation?
 (a) 72° (b) 115° (c) 80° (d) 54° (e) 36°
12. Inventory cost is how much percent more/less than the material cost?
 (a) 15% (b) 20% (c) 10% (d) 17.5% (e) 12.5%
13. If the difference between expense incurred on labor cost and material cost is Rs 27000, then find the overall cost incurred on production of a car?
 (a) Rs 2,70,000 (b) Rs 2,25,000 (c) Rs 2,00,000 (d) Rs 1,00,000 (e) Rs 2,75,000
14. The market price of car is 20% more than the cost price. If the market price of the car is Rs 3,60,000 then what is the cost of material?
 (a) Rs 60,000 (b) Rs 72000 (c) Rs 90,000 (d) Rs 45,000 (e) Rs 54,000
15. If the packaging cost is Rs 13500, then what is the average expense incurred on material, transportation and others?
 (a) Rs 36400 (b) Rs 41400 (c) Rs 38600 (d) Rs 53200 (e) Rs 40500

Direction (16-20) : The given below pie chart shows the percentage distribution of daily consumption of quantity of water by five different families in a building. Read the pie-chart carefully and answer the following questions.

Total quantity of water consumed in a day = 7,000 liters.

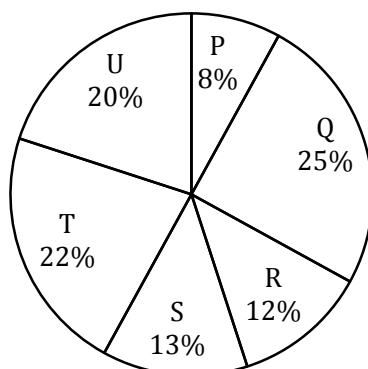
Note-Total quantity of water available = Total quantity of water consumed + total quantity of unused water



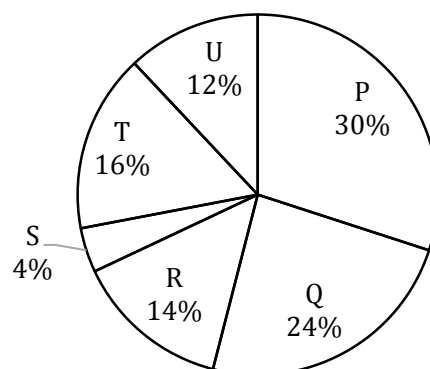
- 16.** The average of quantity of water consumed by families P and S is what percent more/less than the average of quantity of water consumed by families R and U?
 (a) 25% (b) 50% (c) $33\frac{1}{3}\%$ (d) 60% (e) 75%
- 17.** If 87.5% of the quantity of water available is consumed by all families. Then, find the ratio of quantity of unused water to the difference of the quantity of water consumed by families S and Q?
 (a) 6 : 7 (b) 44 : 45 (c) 62 : 63 (d) 20 : 21 (e) 14 : 15
- 18.** Find the ratio of the quantity of water consumed by family S and U together to the quantity of water consumed by families P and R together?
 (a) 11 : 4 (b) 5 : 4 (c) 3 : 2 (d) 13 : 8 (e) 15 : 8
- 19.** $3\frac{1}{7}\%$ of quantity of water consumed by family S is what percent of quantity of water consumed by R.
 (a) $7\frac{1}{2}\%$ (b) $8\frac{1}{2}\%$ (c) 10% (d) 12.5% (e) 11%
- 20.** The difference of the quantity of water consumed by families U and S is how much more than the difference of the quantity of water consumed by family Q and R?
 (a) 350 liter (b) 320 liter (c) 330 liter (d) 360 liter (e) 340 liter

Directions (21-25):- Pie charts given below gives percentage distribution of two type of products (type A and type B) sold by six employees (P, Q, R, S, T and U) of a company. Total no. type A and type B products sold are in ratio 2:5.

Type A product



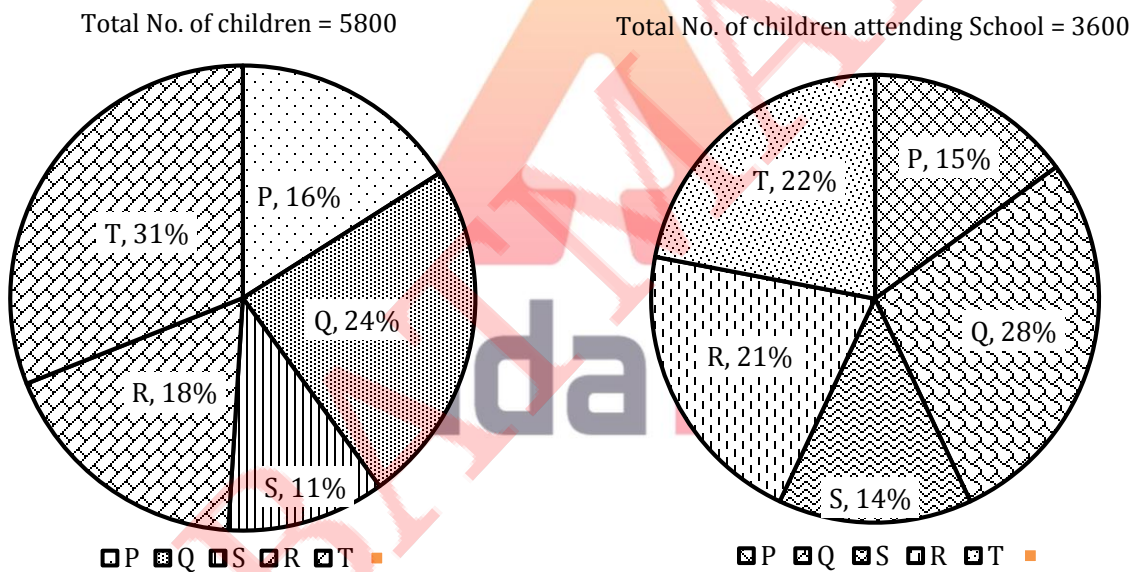
TYPE B PRODUCT



21. No. of type A product sold by P are what percent of no. of type B product sold by S?
 (a) 75% (b) 80% (c) 60% (d) 90% (e) 100%
22. If type A product sold by Q is 240 less than type B product sold by T, then find type A product sold by U.
 (a) 400 (b) 320 (c) 280 (d) 360 (e) None of these.
23. What is the ratio of no. of type A products sold by R and S together to no. of type B products sold by T and U together?
 (a) 5:14 (b) 7:5 (c) 5:7 (d) 2:3 (e) 11:14
24. If no. of type A product sold by T are 15400, then find no. of type B product sold by U are how much more or less than no. of type A product sold by S?
 (a) 15000 (b) 11900 (c) 15900 (d) 15700 (e) 12000
25. If average no. of type B products sold by each employee are 5200, find total no. of type A product sold by Q and U together?
 (a) 5406 (b) 5607 (c) 5660 (d) 5506 (e) 5616

Directions (26-30):- Study the following pie charts carefully and answer the following questions.

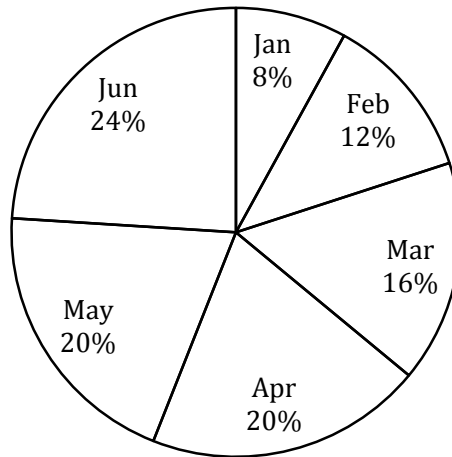
Percentage break up of number of children in five different villages and break up of children attending school from those villages.



26. What is the total number of children not attending school from village Q & S together?
 (a) 528 (b) 508 (c) 518 (d) 618 (e) 628
27. The number of children attending school from P is approximately what percent of the number of children from that village?
 (a) 54% (b) 56% (c) 60% (d) 53% (e) 58%
28. What is the approximate average number of children not attending school from village T, R and S together?
 (a) 476 (b) 458 (c) 464 (d) 470 (e) 466
29. The number of children not attending school from village R and T is approximately what percent of total number of children from village R and T together?
 (a) 43.65% (b) 42.5% (c) 48% (d) 46% (e) 49.45%
30. What is the ratio of total children from village R to the number of children attending school from that village?
 (a) 22 : 21 (b) 29 : 28 (c) 29 : 21 (d) 29 : 27 (e) 23 : 21

Directions (31-35): Pie-chart given below shows percentage distribution of total income of Sandeep in six different months. Study the data carefully and answer the following questions.

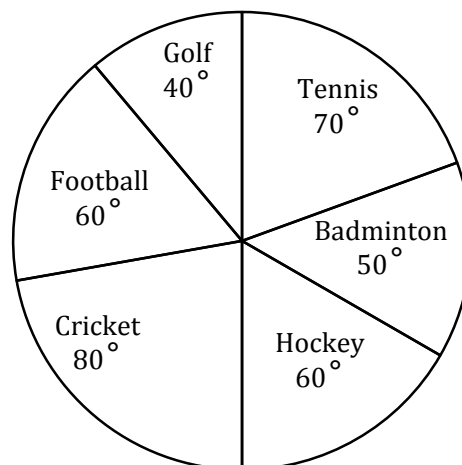
Total income = 15,000



31. Income of Sandeep in the month of Jan and April together is what percent less than income of Sandeep in the month of Mar and Jun together?
 (a) 20% (b) 30% (c) 40% (d) 50% (e) 70%
32. Income of Sandeep in May and Jun together is how much more than the income of Sandeep in Feb and March together? (in Rs.)
 (a) 1500 (b) 1800 (c) 1200 (d) 2400 (e) 2700
33. Which month shows the highest percent increment in income as compare to previous month?
 (a) Feb (b) March (c) April (d) May (e) Both (b) and (c)
34. Income in the month of March and April together makes how much central angle of the total?
 (a) 115.2° (b) 158.4° (c) 144° (d) 100.8° (e) 129.6°
35. Sandeep's average income in starting four months from the given six months is how much less than Sandeep's average income from last four months in the given six months? (in Rs.)
 (a) 300 (b) 600 (c) 900 (d) 1200 (e) 1500

Directions (36-40): Given pie graph shows the number of players in various sports. Study the pie chart carefully and answer the questions.

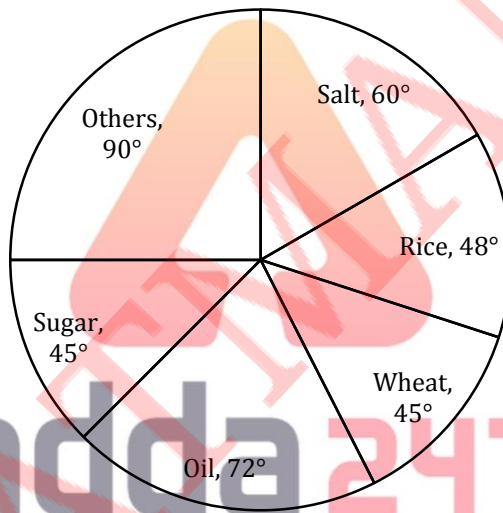
Total players = 1080



36. How many players play Football & Cricket together?
 (a) 520 (b) 400 (c) 420 (d) 450 (e) 380
37. What is the ratio of players playing Tennis & Hockey together to players playing Badminton & Golf together?
 (a) 15:23 (b) 5:7 (c) 9:13 (d) 7:5 (e) 13:9
38. What is average of players playing Tennis, Badminton & Hockey together?
 (a) 280 (b) 270 (c) 190 (d) 180 (e) None of these
39. If 50% Cricket players are females which is same as female Football players. Find male Football players.
 (a) 60 (b) 70 (c) 80 (d) 90 (e) 100
40. Tennis, Hockey & Golf players are what percent of Cricket & Football players?
 (a) $121\frac{4}{7}\%$ (b) $121\frac{3}{7}\%$ (c) $123\frac{3}{7}\%$ (d) $82\frac{3}{7}\%$ (e) $82\frac{6}{7}\%$

Direction (41 – 45): Study the pie-chart given below & answer the questions.

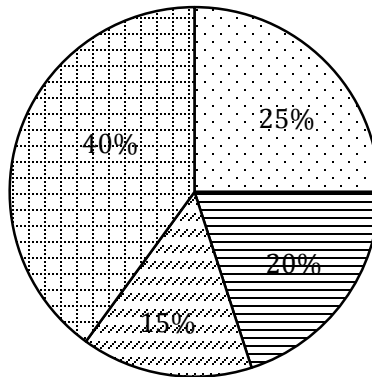
Pie-chart given below shows Yearly degree distribution of expenditure on various items for 'Gopal Dhaba'



41. If expenditure on Salt is Rs 12,000, then expenditure on Sugar and rice together is how much more than expenditure on others?
 (a) Rs 600 (b) Rs 800 (c) Rs 500 (d) Rs 400 (e) Rs 200
42. Total expenditure on Rice and Wheat together is what percent more/less than total expenditure on Salt & oil together?
 (a) $19\frac{6}{11}\%$ (b) $31\frac{6}{11}\%$ (c) $29\frac{5}{11}\%$ (d) $29\frac{6}{11}\%$ (e) $22\frac{2}{3}\%$
43. What is the ratio of average expenditure on Salt & oil to average expenditure on Wheat & others?
 (a) 43 : 45 (b) 43 : 44 (c) 44 : 45 (d) None of these (e) 3 : 5
44. If the total expenditure on all item is given as Rs 1,80,000 and total sugar used by hotel is 300 kg. Then find price of sugar per kg?
 (a) Rs 225 (b) None of these (c) Rs 125 (d) Rs 50 (e) Rs 75
45. If the total expenditure is 200% more than the total saving of the dhaba and total income of dhaba is Rs 2,80,000. Then find the average expenditure of dhaba on salt and sugar?
 (a) Rs 31625 (b) Rs 30625 (c) Rs 29625 (d) Rs 32625 (e) None of these

Direction (46 – 50) : Pie chart given below shows percentage distribution on number of students in three streams (Art, Science & commerce) in four colleges. Read the data carefully and answer the questions.

Total students = 400



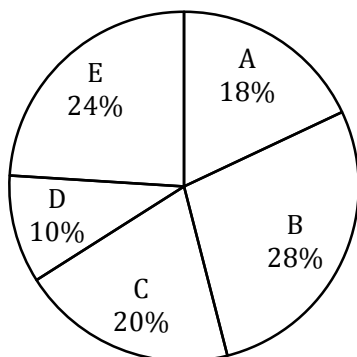
□ A □ B □ C □ D

- 46.** 25% students from each college B & C are in art streams and students in science streams & commerce in C are 25% less than students in science streams & commerce in B respectively. If students in science streams are 21 less than students in commerce in stream C, then find difference between students in commerce & science stream in B?
 (a) 8 (b) 18 (c) 22 (d) 28 (e) 24
- 47.** If 50% students in D are in art stream and ratio of students in science stream to commerce stream is 3 : 5, then find central angle for students in commerce stream in D with respect of total students in all four colleges?
 (a) 108° (b) 30° (c) 45° (d) 72° (e) 54°
- 48.** If 40% students in A are in art stream, then find ratio of students in science stream and commerce stream in A to total students from B?
 (a) 5 : 4 (b) 3 : 7 (c) 3 : 2 (d) 3 : 5 (e) 3 : 4
- 49.** If total students in college E are 50% more than that of in college A and ratio of students in art, science and commerce stream in E is 7 : 3 : 5, then find total students in college C is what percent more than total students in commerce stream in E?
 (a) 12.5% (b) 10% (c) 20% (d) 25% (e) 15%
- 50.** Find difference between average number of students in college B, C & D & total students in D?
 (a) 105 (b) 75 (c) 45 (d) 60 (e) 40

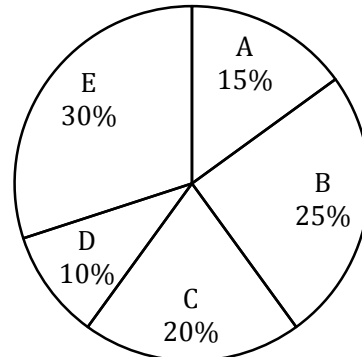
Directions (51-55): Study the pie charts given below and answer the following questions.

Pie charts shows the percentage distribution of total units manufactured of 5 different products (A, B, C, D & E) by 2 different companies – X & Y in 2018.

Total units manufactured by company - X = 50000



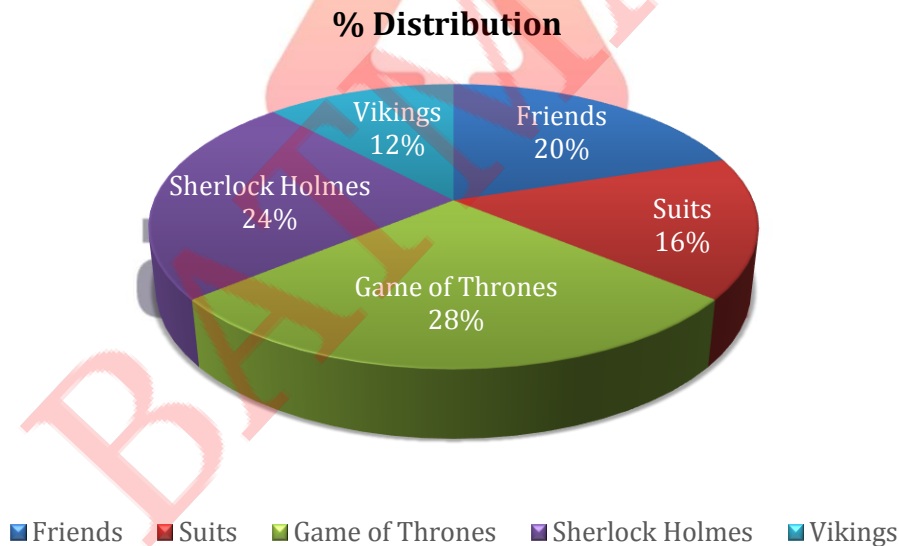
Total units manufactured by company - Y = 80000



51. Find ratio of product - C manufactured by company - X & Y together in 2018 to product - E manufactured by company - X & Y together in 2018.
 (a) 6 : 5 (b) 11 : 7 (c) 15 : 11 (d) 4 : 1 (e) None of the above.
52. If company - X sold 80% of the total units of products manufactured by it and ratio of units sold of product - A, B, C, D & E of company - X is 2 : 3 : 2 : 1 : 2 respectively, then find sold units of products - B, C & E together of company - X are how much less than units manufactured of product - B & C together of company - Y?
 (a) 8000 units (b) 10000 units (c) 7000 units (d) 9000 units (e) 11000 units
53. If units manufactured by company - Y in 2019 are 25% more than that of in 2018 and production of product - A, C, D & E of company - Y in 2019 increased by 50%, 25%, 150% & 12.5% respectively as compared to previous year, then find % change in production of product - B of company - Y in 2019 as compared to previous year.
 (a) 25% (b) 30% (c) 27% (d) 20% (e) 24%
54. Average number of units manufactured by company - X of products - C, D & E are what percent of units manufactured by company - Y of product - B?
 (a) 50% (b) 40% (c) 60% (d) 45% (e) 55%
55. Products - A & B manufactured by company - X together are how much less than products - C & E manufactured by company - Y together?
 (a) 15000 units (b) 13000 units (c) 16000 units (d) 17000 units (e) 14000 units

Directions (56-60): Read the below mentioned pie chart carefully to answer the following questions.

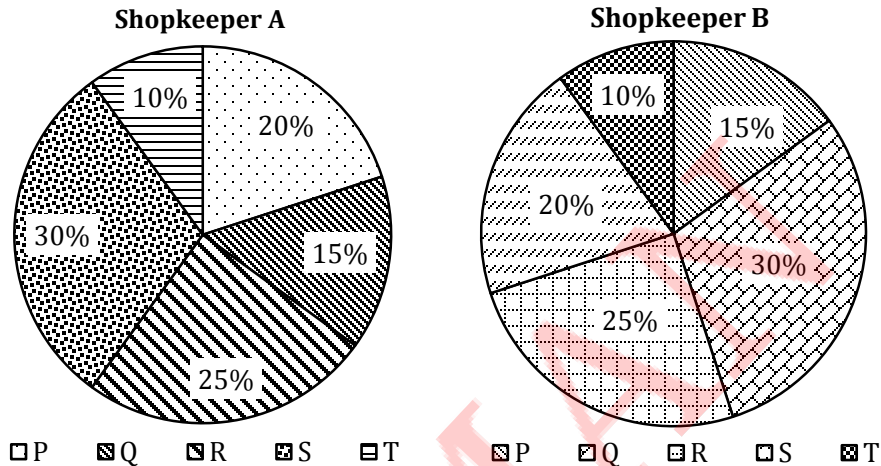
Pie chart shows the percentage distribution of people who watches different web series. Consider that people watch no other web series apart from those which are mentioned in the pie chart.



56. The ratio of male to female watching Suits is 23 : 17 and people watching Friends is 40000 less than the people watching Sherlock Holmes. Find difference between total male watching Suits and total female watching Suits?
 (a) 16000 (b) 24000 (c) 28000 (d) 30000 (e) 36000
57. 30% people who watch Friends also watch Sherlock Holmes and number of females watching both Friends & Sherlock Holmes is 16000. Then find ratio of male to female watching Vikings, if number of males watching Vikings is 32000. (Ratio of male to female watching both Friends & Sherlock Holmes is 7:8)?
 (a) 12 : 11 (b) 4 : 3 (c) 8 : 7 (d) 1 : 2 (e) 9 : 7
58. Average of people watching Friends, Suits and Sherlock Holmes is 20000. Ratio of male to female watching Game of Thrones and Vikings is 13 : 7 and 5 : 7 respectively. Find the difference between number of males watching Vikings and number of females watching Game of thrones.
 (a) 4800 (b) 9800 (c) 5000 (d) 11200 (e) 13200

59. Find the central angle (in degrees) of people watching Game of Thrones web series.
 (a) 121.2 (b) 100.8 (c) 112.9 (d) 105.5 (e) 116.2
60. People watching Sherlock Holmes & Suits together is what percent of people watching Friends, Game of Thrones and Vikings together?
 (a) 50% (b) 100% (c) $63\frac{2}{3}\%$ (d) $60\frac{2}{3}\%$ (e) $66\frac{2}{3}\%$

Direction (61 – 65) : Given below pie chart (I) shows percentage distribution of five items with shopkeeper 'A', while pie chart (II) shows percentage distribution of these same five items with 'B'. Read the data carefully and answer the question.



61. If total number of items with 'B' is 60% more than that of total number of items with 'A', then find item R with shopkeeper B are what percent of total no. of items with A?
 (a) $27\frac{1}{2}\%$ (b) 40% (c) 30%
 (d) 20% (e) $33\frac{1}{3}\%$
62. If total item Q with 'A' is 40% of same items with 'B', then find total number of items with 'B' is what percent more than that of total items with 'A'?
 (a) 20% (b) 15% (c) 10%
 (d) 25% (e) 30%
63. If total number of items with 'A' is 40% more than that of with 'B' and total number of item T with A and B is 384, then find the total number of items S with both 'A' & 'B' together?
 (a) 992 (b) 988 (c) 990
 (d) 996 (e) 998
64. If ratio of total items with 'A' to that of with 'B' is 3 : 4, then what is the percentage of total items P with both 'A' & 'B' together?
 (a) $15\frac{1}{7}\%$ (b) $13\frac{1}{7}\%$ (c) $11\frac{1}{7}\%$
 (d) $9\frac{1}{7}\%$ (e) $17\frac{1}{7}\%$
65. Total items with 'B' are 80% more than total items with 'A' and total items R with both A & B together is 840, then find difference between total items S with 'A' and total items T with 'B' has?
 (a) 142 (b) 140 (c) 144
 (d) 148 (e) 152

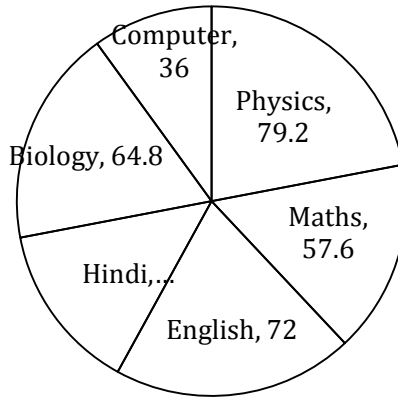
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Directions (66-70): Study the pie chart given below and answer the following questions.

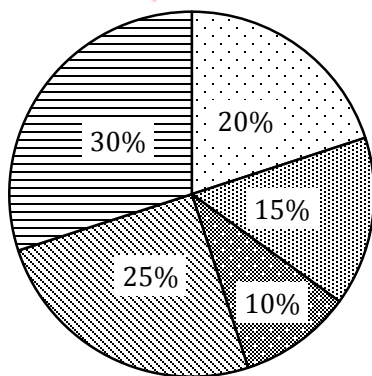
Pie chart shows the degree-wise distribution of the number of students enrolled for master degree in different subject.



66. If 10% of student who are doing master in English is 144 then, number of student doing master in Biology and Hindi together are how much more/less than number of students doing master in physics & Maths together?
 (a) 536 (b) 628 (c) 584 (d) 432 (e) 486
67. Total number of males doing master in computer is 360 and females doing masters in computers are $33\frac{1}{3}\%$ more than males. If ratio of males to females doing master in English is 4 : 1, then females doing master in English are what percent more/less than females doing master in computer?
 (a) 25% (b) 45% (c) 40% (d) 30% (e) 20%
68. 40% of students doing master in biology failed and remaining completed the degree. If students who completed master in biology are 540 then find the ratio of students who failed in biology to the total student doing master in Physics?
 (a) 21 : 59 (b) 18 : 53 (c) 19 : 54 (d) 18 : 55 (e) 55 : 18
69. If average of number of male and female students who are enrolled for master degree in Maths is 576 then find the average number of students who are enrolled in physics, Biology and English together?
 (a) 1560 (b) 1260 (c) 1440 (d) 1480 (e) 1620
70. If average of student doing master in all subject is 1800 and ratio of male to female pursuing masters in English & Hindi are 2 : 3 and 1 : 2 respectively then males perusing master in English are how much percent less than the females doing master in Hindi?
 (a) $18\frac{2}{3}\%$ (b) 16% (c) $12\frac{1}{2}\%$ (d) $16\frac{2}{3}\%$ (e) $14\frac{2}{7}\%$

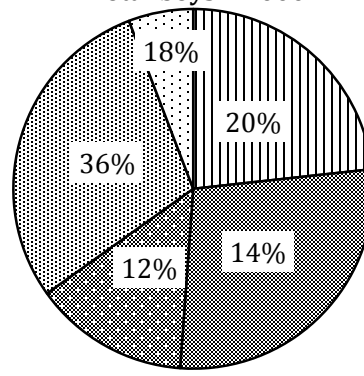
Direction (71 – 75): Pie chart (i) given below show percentage distribution of total (students + teacher) in five schools and pie chart (ii) shows percentage distribution of total boys in these five schools. Read the data carefully and answer the questions given below.

(Students + Teachers) = 6000



□ P ■ Q ▨ R ▩ S □ T

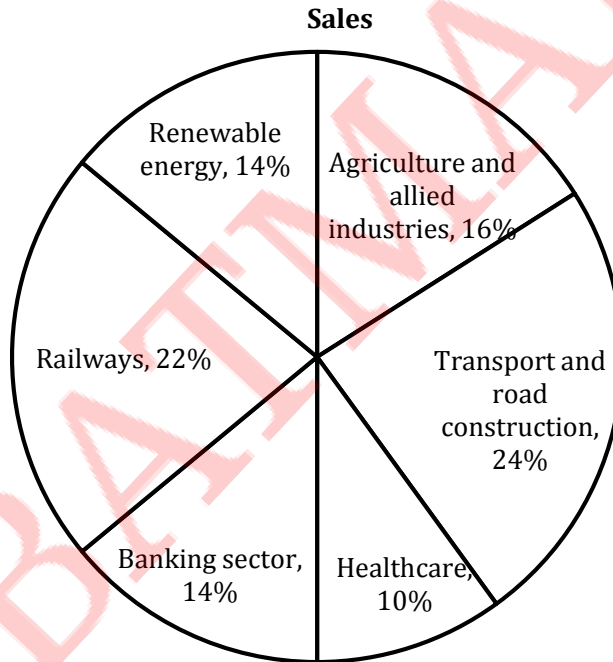
Total boys = 4000



□ P ■ Q ▨ R ▩ S □ T

71. If ratio of teachers to girls in P & S is 3 : 13 and 1 : 3 respectively, then find total teachers in P & S together is what percent of total boys in T?
 (a) 8.33% (b) 16% (c) 12% (d) 12.5% (e) 6.66%
72. If ratio of teachers to girls in Q is 3 : 14 and total girls are two times more than teachers in R, then find ratio of total girls in Q & R together to total boys in S?
 (a) 37 : 147 (b) 37 : 142 (c) 37 : 150 (d) 37 : 144 (e) 37 : 156
73. Find average number of (girls + teachers) in R & T is what percent less than total boys in P?
 (a) 40% (b) 30% (c) 20% (d) 25% (e) 45%
74. The ratio of girls to teacher in T is 17 : 7 and total girls in school A is 35 more than that of in T. If total girls in A is 40% of total people in that school, then find difference between (boys + teacher) in T and A?
 (a) 100 (b) 165 (c) 125 (d) 115 (e) None of these
75. If in P, Q and R total teachers are 180, then find total girls in these three schools are how much less than total boys in these three schools?
 (a) 1160 (b) 1190 (c) 1140 (d) 1120 (e) 1100

Direction (76-80) : Given below the pie chart which shows the distribution of budget allotted by the government for six sectors in 2016. Read the graph carefully and answer the following questions.



Note:

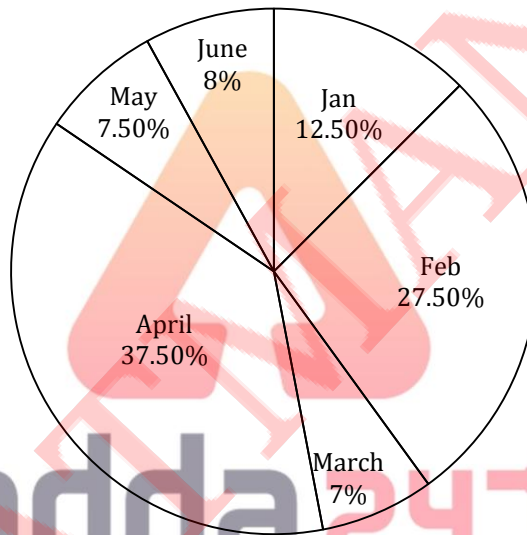
- (i) Total budget allotted in 2016 and 2017 is in the ratio of 3 : 4 (in lakh cr)
 (ii) The percentage distribution for all the six sectors remains same in both the years.

76. The total budget allotted for transport and road construction sector in the year 2016 is further distributed in the construction of National Highway, bridges and rural road in the ratio of 9 : 8 : 7. If the budget used for rural road construction in the year 2016 is Rs 4935 lakh cr. Then find the total budget allotted for Transport and road construction sector in the year 2017 (in lakh crore)?
 (a) 23500 (b) 23560 (c) 22500 (d) 22560 (e) 23250
77. If the total budget allotted for Agriculture and allied industries & banking sector in the year 2017 is 9864 lakh cr. more than the budget allotted for Railways & Renewable energy sector in the year 2016. Then find the total budget allotted for all the six sectors in the year 2016?
 (a) 246060 (b) 246200 (c) 246800 (d) 246000 (e) 246600

78. Total budget allotted for Renewable energy, agriculture and allied industries sector in the year 2016 is what per cent less than the total budget allotted for banking & Healthcare sector in the year 2017?
 (a) $4\frac{1}{4}\%$ (b) $6\frac{1}{4}\%$ (c) $8\frac{1}{4}\%$ (d) $10\frac{1}{4}\%$ (e) $2\frac{1}{4}\%$
79. Find the ratio between the total budget allotted for railways & banking sector in the year 2017 to the total budget allotted for agriculture and allied industries & transport and road construction sector in the year 2016?
 (a) 4 : 5 (b) 5 : 6 (c) 6 : 5 (d) 4 : 3 (e) 3 : 4
80. Budget allotted for banking sector in the year 2017 is Rs. 21372 lakh cr more than the budget allotted for healthcare sector in 2016. Find the average of the total budget allotted for railway & transport and road construction sector in the year 2017?
 (a) 75624 (b) 75264 (c) 75462 (d) 75662 (e) 75684

Directions (81-85): Pie diagram given below shows percentage distribution of watches sold of a company in first six months of year 2017. Study the data carefully and answer the following questions.

Watches sold in first six months in 2017

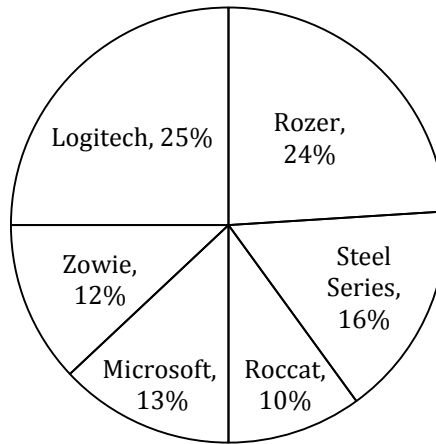


@cetexamgroup

Note:

- Total watches sold by company 'X' in 2017 = 22500
 - Consider percentage distribution of watches sold in first six months remain same for all years.
81. If total watches sold in February is 3300, then find average number of watches sold in last six months of year 2017?
 (a) 2000 (b) 2250 (c) 1550 (d) 1600 (e) 1750
82. If ratio between watches sold in first six months to last six months is 2 : 3, then find watches sold in April are how much more than watches sold in March, May and June together?
 (a) 2025 (b) 1550 (c) 1350 (d) 3375 (e) 1450
83. In 2018, total number of watches sold are 10% more than total watches sold in 2017. Find watches sold in June 2018 if $33\frac{1}{3}\%$ of total watches sold in 2018 is sold in last six months of 2018?
 (a) 1320 (b) 1470 (c) 1250 (d) 1520 (e) 1650
84. If watches sold in May 2017 were $3\frac{1}{3}\%$ of total watches sold in 2017, then find total number of watches sold in last six months of 2017?
 (a) 13500 (b) 15000 (c) 12500 (d) 14500 (e) 15750
85. Watches sold in February 2017 were 3000 more than watches sold in January 2017. Total number of watches sold in last six months of 2017 is what percent of total watches sold in 2017?
 (a) $7\frac{1}{7}\%$ (b) $11\frac{1}{9}\%$ (c) $12\frac{1}{2}\%$ (d) $9\frac{1}{11}\%$ (e) $6\frac{2}{3}\%$

Directions (86-90): Given below pie chart show percentage distribution of total mouse manufactured by six companies in 2016. Read chart carefully and answer the question:

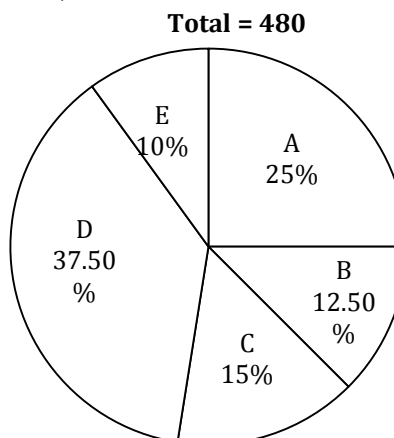


Note:

- I. Ratio between total mouse manufactured by these six companies in 2016 to total mouse manufactured in 2017 is 4 : 7
 II. Percentage distribution for both the years remain same for all six companies.

- 86.** If difference between mouse manufactured by Logitech & Roccat together in 2016 and mouse manufactured by Rozer & Zowie together in 2017 is 4480 then find total number of mouse manufactured by Microsoft & Steel Series in 2017?
 (a) 8120 (b) 8020 (c) 8220 (d) 8320 (e) 8420
- 87.** Find ratio between total number of mouse manufactured by Rozer, Steel Series and Zowie together in 2016 to total number of mouse manufactured by Logitech & Microsoft in 2017?
 (a) 127 : 133 (b) 133 : 103 (c) 103 : 133 (d) 133 : 104 (e) 104 : 133
- 88.** If ratio between wireless mouse to wired mouse manufactured by Roccat is 2 : 3 for both the years and difference between wireless mouse manufactured by Roccat in both the years is 480. Find total number of wire mouse manufactured by Roccat in both year?
 (a) 2540 (b) 2640 (c) 2620 (d) 2720 (e) 2820
- 89.** Total number of mouse manufactured by Zowie & Roccat in 2017 is what percent more or less than total number of mouse manufactured by Rozer & Steel Series in 2016?
 (a) $4\frac{3}{4}\%$ (b) $3\frac{3}{4}\%$ (c) $3\frac{2}{3}\%$ (d) $5\frac{2}{4}\%$ (e) $6\frac{2}{4}\%$
- 90.** If total mouse manufactured by Rozer and Steel Series in 2017 is 11200. Find average number of mouse manufactured by Logitech, Roccat and Microsoft in 2016?
 (a) 2520 (b) 2540 (c) 2560 (d) 2580 (e) 3060

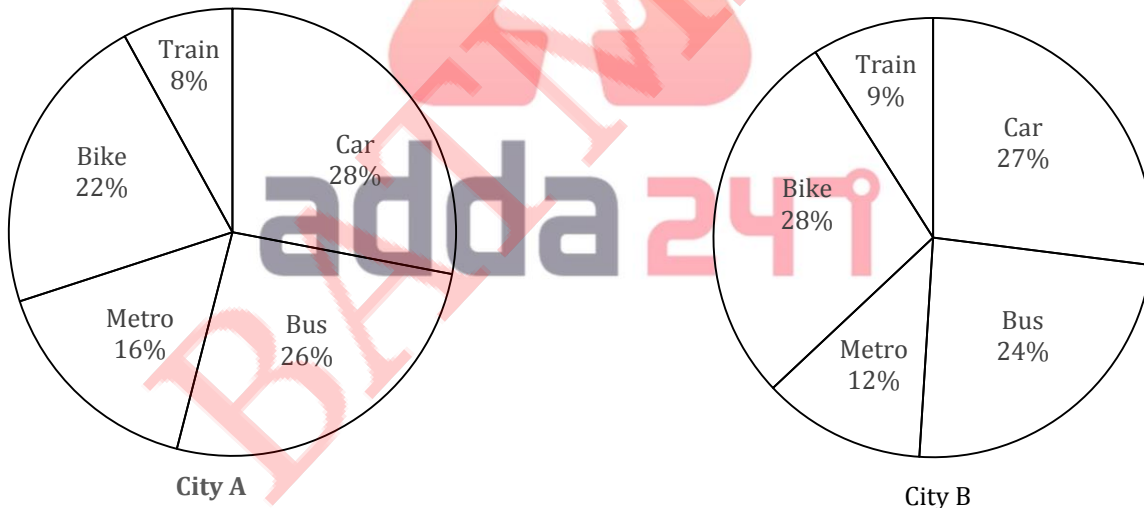
Directions (91-95): Given below is a pie-graph that shows percentage of HR managers out of total managers in five different companies i.e. A, B, C, D and E in March, 2016.



Note: Any HR manager leaves or enters a company only in April 2017.

91. The ratio of male HR managers to female HR managers in company D in 2016 was 3 : 2 and 24 female HR managers left the company D in 2017. Find the percentage increase in number of female HR managers in company D in 2017 if there were 42 male managers out of newly recruited 72 managers.
 (a) $8\frac{1}{3}\%$ (b) 8% (c) 9% (d) $6\frac{2}{3}\%$ (e) none of these
92. In 2017 $33\frac{1}{3}\%$ HR managers from company A shifted to company B. If ratio of male to female HR managers in company A and B in 2016 was 5 : 7 and 3 : 1 respectively and 25 female manager left company A, then find remaining male managers in company A is what percent of number of male managers in company B.
 (a) $68\frac{1}{3}\%$ (b) $58\frac{1}{3}\%$ (c) $48\frac{1}{3}\%$ (d) $38\frac{1}{3}\%$ (e) none of these
93. The ratio of male to female HR managers in company C in 2016 was 5 : 4 while in 2017 the ratio was 11 : 9. If 13 female HR managers joined company C in 2017, then find total number of HR managers in company C in 2017.
 (a) 200 (b) 150 (c) 100 (d) 250 (e) none of these
94. In 2017, 25% of HR managers from company D left the job and company B recruited 40% more HR managers more than the number of HR managers it had in 2016. If ratio of male to female HR managers in company D and B becomes 8 : 7 and 7 : 5 respectively, then find the ratio of number of male HR managers in company D in 2017 to number of female HR managers in company B in 2017.
 (a) 71:32 (b) 45:34 (c) 65:36 (d) 72:35 (e) none of these
95. If in 2017 company A and C fired 20% and 25% of their HR managers respectively, then find the remaining number of HR managers in these two companies in 2017 is what percent of number of total HR managers in company E in 2016. (approximate value)
 (a) 100% (b) 200% (c) 300% (d) 250% (e) none of these

Directions (96-100): Pie-chart given below shows population of two cities travel by five modes of transportation. Study the chart carefully and answer the following question.



Note: - Ratio of total population of city A to city B is 5 : 2.

96. Total number of person travel by bike in city A is 945 more than that of in city B, then find the total number of person who travel by bus in city A and city B together?
 (a) 3010 (b) 3115 (c) 3055 (d) 3085 (e) 3145
97. Number of females travel by car in city B is 25% more than number of males travel by car in city B, which is 25% of number of males travel by car in city A. If total number of person travel by metro in city B is 456, then find the number of females travel by car in city A.
 (a) 570 (b) 1140 (c) 1824 (d) 836 (e) 912
98. If total number of person travel by car from city A and city B together is 582, then total number of person travel by bike and metro together from city A is what percent more than total number of person travel by bike and metro together from city B?
 (a) 37.5% (b) 50% (c) 137.5% (d) 150% (e) 237.5%

99. If number of person travel by car in city B is 126 more than number of person travel by train in city A, then find the average number of person travel by metro in city A and B together?
 (a) 468 (b) 364 (c) 414 (d) 428 (e) 442
100. Total number of person in city B who travel by metro and train together is how much more than total number of person in city A who travel by train. If it is given that total population of city B is 95 more than total number of person in city A who travel by bike and metro together.
 (a) 13 (b) 15 (c) 17 (d) 19 (e) 21

Practice MCQs for Prelims_(Solutions)

1. (d): total watches manufactured by Casio, Titan & Sonata = $\frac{20+15+25}{100} \times 1000 = 600$
 required average = $\frac{600}{3} = 200$
2. (c): required ratio = $\frac{10+25}{100} \times 1000 : \frac{20+20}{100} \times 1000 = 7:8$
3. (b): watches manufactured of Sonata = $\frac{25}{100} \times 1000 = 250$
 Watches manufactured of Rado = $\frac{10}{100} \times 1000 = 100$
 Required % = $\frac{250-100}{100} \times 100 = 150\%$
4. (e): in next year
 No. of Titan watches manufactured = $\frac{110}{100} \times \frac{15}{100} \times 1000 = 165$
 No. of Timex watches manufactured = $\frac{90}{100} \times \frac{10}{100} \times 1000 = 90$
 Required difference = $165 - 90 = 75$
5. (b): Average no. of watches manufactured = $\frac{1000}{6} = 166.67$
 Watches manufactured
 Casio = $\frac{20}{100} \times 1000 = 200$
 Titan = $\frac{15}{100} \times 1000 = 150$
 Sonata = $\frac{25}{100} \times 1000 = 250$
 Timex = $\frac{10}{100} \times 1000 = 100$
 Fossil = $\frac{20}{100} \times 1000 = 200$
 Rado = $\frac{10}{100} \times 1000 = 100$
 Required answer = Casio, Sonata, Fossil = 3
6. (e): average no. of voter in city P, Q and U
 = $\left(\frac{12+18+15}{3}\right)\% = 15\%$
 So, average no. of voters in city P, Q and U equal to total no. of voters in city U (15%)
7. (a): required no. of voters = $75000 \times \frac{20}{100} \times \frac{10}{100} + 75000 \times \frac{22}{100} \times \frac{12}{100} = 3480$
8. (a): required difference
 = $75000 \times \frac{(18+22-12-13)}{100} = 11250$
9. (b): required difference
 = $75000 \times \frac{15}{100} \times \frac{29}{45} - 75000 \times \frac{13}{100} \times \frac{13}{25} = 2180$
10. (a): In city T
 Total no. of female who did not cast vote = $75000 \times \frac{22}{100} \times \frac{40}{100} \times \frac{20}{100} = 1320$
 Total voters who did not cast vote = $75000 \times \frac{22}{100} - 13840 = 2660$
 Total male who did not cast vote = $2660 - 1320 = 1340$
 Required difference = $1340 - 1320 = 20$
11. (e): Required angle = $\frac{10}{100} \times 360 = 36^\circ$
12. (c): Required percent = $\frac{(20-18)}{20} \times 100 = 10\%$
13. (b): Required cost = $\frac{27000}{(32-20)} \times 100 = \text{Rs } 2,25,000$
14. (a): Cost price of the car = $\frac{360000}{120} \times 100 = \text{Rs } 3,00,000$
 So, material cost = $\frac{20}{100} \times 300000 = \text{Rs } 60,000$
15. (e): Average expense incurred on material, transportation and others = $\frac{20+10+15}{3} = 15\%$
 Required cost = $\frac{13500}{5} \times 15 = \text{Rs } 40500$
16. (b): Required % = $\frac{\left(\frac{10+35}{2}\right) - \left(\frac{10+20}{2}\right)}{\left(\frac{10+20}{2}\right)} \times 100 = 50\%$
17. (d): Total quantity of water available = $7000 \times \frac{8}{7}$ liter = 8000 liters
 Required ratio = $\frac{1000}{(35-20) \times \frac{7000}{100}} = \frac{1000}{1050} = \frac{20}{21}$
18. (a): Required ratio = $\frac{(35+20)}{(10+10)} = \frac{55}{20} = \frac{11}{4}$

19. (e): $3\frac{1}{7}\%$ of Quantity of water consumed by S =

$$\frac{22}{7 \times 100} \times \frac{35}{100} \times 7000$$

$$= 77 \text{ liters}$$
 Required percentage = $\frac{77}{\frac{10 \times 7000}{100}} \times 100 = 11\%$

20. (a): Required quantity = $\frac{(35-20) \times 7000}{100} - \frac{(20-10)}{100} \times 7000$

$$= \frac{5}{100} \times 7000 = 350 \text{ liter}$$

21. (b): Let total no. of type A and type B products sold are $2x$ and $5x$ respectively.
 Required percentage = $\frac{2x \times \frac{8}{100}}{5x \times \frac{4}{100}} \times 100$

$$= 80\%$$

22. (b): Let total no. of type A and type B products sold are $2x$ and $5x$ respectively.
 ATQ,

$$5x \times \frac{16}{100} - 2x \times \frac{25}{100} = 240$$

$$\frac{80x}{100} - \frac{50x}{100} = 240$$

$$\frac{30x}{100} = 240$$

$$x = 800$$
 So, required number of products = $2x \times \frac{20}{100}$

$$= 320$$

23. (a): Let total no. of type A and type B products sold are $2x$ and $5x$ respectively
 Required ratio = $2x \times \frac{13+12}{100} : 5x \times \frac{16+12}{100}$

$$= 2x \times 25 : 5x \times 28 = 5 : 14$$

24. (b): Let total no. of type A and type B products sold are $2x$ and $5x$ respectively
 ATQ

$$2x \times \frac{22}{100} = 15400$$

$$x = 35000$$
 Required difference = $5 \times 35000 \times \frac{12}{100} - 2 \times 35000 \times \frac{13}{100}$

$$= 21000 - 9100$$

$$= 11900$$

25. (e): Let total no. of type A and type B products sold are $2x$ and $5x$ respectively
 ATQ

$$\frac{5x}{6} = 5200$$
 So, $2x = \frac{5200 \times 6 \times 2}{5}$

$$2x = 12480$$
 total no. of type A product sold by Q and U together = $12480 \times \frac{20+25}{100} = 5616$

26. (c): No. of children not attending school from Q and R together

$$= \left(5800 \times \frac{24}{100} - \frac{28}{100} \times 3600\right) + \left(5800 \times \frac{11}{100} - 3600 \times \frac{14}{100}\right)$$

$$= 2030 - 1512 = 518$$

27. (e): Required % = $\frac{\frac{15}{100} \times 3600}{\frac{16}{100} \times 5800} \times 100 = 58.18 \approx 58\%$

28. (a): Required Average = $\frac{\frac{5800}{100} \times (31+11+18) - 3600 \times \frac{(22+14+21)}{100}}{3}$

$$= \frac{58 \times 60 - 36 \times 57}{3} = \frac{1428}{3} = 476$$

29. (d): Required % = $\frac{5800 \times \frac{(18+31)}{100} - 3600 \times \frac{(21+22)}{100}}{5800 \times \frac{(18+31)}{100}} \times 100$

$$= \frac{(58 \times 49 - 36 \times 43)}{58 \times 49} \times 100 = \frac{(2842 - 1548)}{2842} \times 100$$

$$= \frac{1294}{2842} \times 100$$

$$= 45.53 \approx 46\%$$

30. (c): Required Ratio = $\frac{18 \times 58}{36 \times 21}$

$$= 29 : 21$$

31. (b): Required % = $\frac{16+24-8-20}{(16+24)} \times 100$

$$= \frac{12}{40} \times 100$$

$$= 30\%$$

32. (d): Required difference

$$= \frac{[20+24-12-16]}{100} \times 15000$$

$$= \text{Rs. } 2400$$

33. (a): It can be seen easily from the pie-chart that February month shows the highest percent increase in income as compare to previous month which is equal to

$$= \frac{12-8}{8} \times 100$$

$$= \frac{4}{8} \times 100$$

$$= 50\% \text{ increment.}$$

34. (e): Required central angle

$$= (20 + 16) \times \frac{18}{5}$$

$$= 129.6^\circ$$

35. (c): Sandeep's average income in starting four months

$$= \frac{(8+12+16+20)}{4 \times 100} \times 15000$$

$$= \text{Rs. } 2100$$
 Sandeep's average income in Last four months

$$= \frac{(16+20+20+24)}{4 \times 100} \times 15000 = \text{Rs. } 3000$$
 Required difference = $3000 - 2100 = \text{Rs. } 900$

- 36. (c):** players playing Football & Cricket = $\frac{60^\circ+80^\circ}{360^\circ} \times 1080 = 420$
- 37. (e):** required ratio = $\frac{70^\circ+60^\circ}{360^\circ} \times 1080 : \frac{50^\circ+40^\circ}{360^\circ} \times 1080 = 13:9$
- 38. (d):** required average = $\frac{70^\circ+50^\circ+60^\circ}{360^\circ} \times \frac{1080}{3} = 180$
- 39. (a):** total cricket players = $\frac{80^\circ}{360^\circ} \times 1080 = 240$
 Female cricket players
 $= \frac{50}{100} \times 240 = 120 =$ Female football players
 Total football players = $\frac{60^\circ}{360^\circ} \times 1080 = 180$
 Male football players = $180 - 120 = 60$
- 40. (b):** total tennis, hockey & golf players = $\frac{70^\circ+60^\circ+40^\circ}{360^\circ} \times 1080 = 510$
 Total cricket & football players
 $= \frac{80^\circ+60^\circ}{360^\circ} \times 1080 = 420$
 Required % = $\frac{510}{420} \times 100 = 121\frac{3}{7}\%$
- 41. (a):** Total expenditure by Gopal Dhaba = $\frac{12000}{60} \times 360$
 $= \text{Rs } 7,2000$
 \therefore Required Difference = $[(45 + 48) - 90] \times \frac{72000}{360} = \text{Rs. } 600$
- 42. (d):** Required % = $\frac{(60 + 72) - (48 + 45)}{(60 + 72)} \times 100$
 $= \frac{(132 - 93)}{132} \times 100$
 $= \frac{3900}{132} \% = 29\frac{6}{11}\%$
- 43. (c):** Required ratio = $\frac{\left(\frac{60+72}{2}\right)}{\left(\frac{45+90}{2}\right)}$
 $= \frac{132}{135} = 44 : 45$
- 44. (e):** Expenditure of sugar = $\frac{45}{360} \times 180,000$
 $= 22,500 \text{ Rs.}$
 \therefore Price of Sugar per kg = $\frac{22,500}{300} = \text{Rs. } 75$
- 45. (b):** Let, saving of Dhaba be Rs x,
 \therefore Expenditure of dhaba be Rs 3x
 We know,
 Income = Saving + expenditure
 $280000 = \text{Saving} + \text{expenditure}$
 $280000 = 4x$
 $\therefore x = 70,000$
 \therefore Total expenditure = Rs 210,000
 \therefore Required average = $\frac{1}{2} \times \frac{105}{360} \times 210000$
 $= \text{Rs. } 30625$

- 46. (d):** Total students in science streams & commerce in
 $B = 400 \times \frac{20}{100} \times \frac{75}{100} = 60$
 Total students in science streams & commerce in
 $C = 400 \times \frac{15}{100} \times \frac{75}{100} = 45$
 Let students in commerce in C = x
 And, students in science in C = y
 ATQ -
 $x + y = 45$ ----- (i)
 Given, $x - y = 21$ ----- (I)
 From (i) & (ii) we get -
 $x = 33, y = 12$
 Students in commerce in B = $33 \times \frac{4}{3} = 44$
 Students in science in B = $12 \times \frac{4}{3} = 16$
 Required difference = $44 - 16 = 28$
- 47. (c):** Total students in commerce stream in D = 400
 $\times \frac{40}{100} \times \frac{50}{100} \times \frac{5}{8} = 50$
 Required angle = $\frac{50}{400} \times 100 \times \frac{360}{100}$
 $= \frac{50}{4} \times \frac{360}{100} = 45^\circ$
- 48. (e):** Students in science stream and commerce stream
 in A = $400 \times \frac{25}{100} \times \frac{60}{100} = 60$
 Total students in B = $400 \times \frac{20}{100} = 80$
 Required ratio = $60 : 80 = 3 : 4$
- 49. (c):** Total students in college E
 $= 400 \times \frac{25}{100} \times \frac{150}{100} = 150$
 Total students in commerce stream in E = 150
 $\times \frac{5}{15} = 50$
 Total students in C = $400 \times \frac{15}{100} = 60$
 Required percentage = $\frac{60-50}{50} \times 100$
 $= \frac{10}{50} \times 100 = 20\%$
- 50. (d):** Average number of students in college B, C & D
 $= \frac{1}{3} \times \frac{(20+15+40)}{100} \times 400 = 100$
 Total students in D = $400 \times \frac{40}{100} = 160$
 Required difference = $160 - 100 = 60$
- 51. (e):** Product - C manufactured by company - X & Y together
 $= \left(\frac{20}{100} \times 50000\right) + \left(\frac{20}{100} \times 80000\right)$
 $= 10000 + 16000$
 $= 26000 \text{ units}$
 Product - E manufactured by company - X & Y together
 $= \left(\frac{24}{100} \times 50000\right) + \left(\frac{30}{100} \times 80000\right)$
 $= 12000 + 24000$
 $= 36000 \text{ units}$
 Required ratio = $\frac{26000}{36000}$
 $= 13 : 18$

52. (a): Units sold by company - X = $\frac{80}{100} \times 50000$

= 40000 units

Sold units of products - B, C & E together of company - X = $40000 \times \frac{(3+2+2)}{10}$

= 28000 units

Units manufactured of product - B & C together of company - Y = $80000 \times \frac{(25+20)}{100}$

= 36000 units

Required difference = 36000 - 28000

= 8000 units

53. (a): Total units manufactured by company - Y in 2019 = $\frac{125}{100} \times 80000$

= 100000 units

Production of product - A by company - Y in 2019

= $\frac{150}{100} \times 80000 \times \frac{15}{100}$

= 18000 units

Production of product - C by company - Y in 2019

= $\frac{125}{100} \times 80000 \times \frac{20}{100}$

= 20000 units

Production of product - D by company - Y in 2019

= $\frac{250}{100} \times 80000 \times \frac{10}{100}$

= 20000 units

Production of product - E by company - Y in 2019

= $\frac{112.5}{100} \times 80000 \times \frac{30}{100}$

= 27000 units

Required % change = $100\% -$

$\left(\frac{100000 - (18000 + 20000 + 20000 + 27000)}{(80000 \times \frac{25}{100})} \times 100 \right) \%$

= $100\% - \left(\frac{15000}{20000} \times 100 \right) \%$

= 25%

54. (d): Average number of units manufactured by company - X of products - C, D & E

= $\frac{1}{3} \times \left(50000 \times \frac{(20+10+24)}{100} \right)$

= 9000 units

Units manufactured by company - Y of product -

B = $\frac{25}{100} \times 80000$

= 20000 units

Required % = $\frac{9000}{20000} \times 100$

= 45%

55. (d): Products - A & B manufactured by company - X together = $50000 \times \frac{(18+28)}{100}$

= 23000 units

Products - C & E manufactured by company - Y

together = $80000 \times \frac{(20+30)}{100}$

= 40000 units

Required difference = 40000 - 23000

= 17000 units

56. (b): ATQ,

Total people watching Suits = $\frac{16}{100} \times \left[40000 \times \left(\frac{100}{4} \right) \right] = 160000$

Number of females watching Suits = $160000 \times \frac{17}{40}$

= 68000

Number of males watching Suits = $160000 \times \frac{23}{40} = 92000$

Required difference = 92000 - 68000 = 24000

57. (c): Let number of male & female watching both Friends & Sherlock Holmes be '7x' & '8x' respectively.

ATQ,

Total number of people watching Friends = 16000

$\times \frac{15x}{8x} \times \frac{100}{30} = 100000$

Total number of people watching Viking = 100000

$\times \frac{100}{20} \times \frac{12}{100} = 60000$

Number of females watching Vikings = 60000 - 32000 = 28000

Required Ratio = $\frac{32000}{28000} = 8 : 7$

58. (a): Let total number of people watching all the web series be x.

ATQ, $20000 = \frac{\frac{20}{100} \times x + \frac{16}{100} \times x + \frac{24}{100} \times x}{3}$

$\Rightarrow 20000 = \frac{60x}{300}$

$\Rightarrow x = 100000$

Number of males watching Vikings = $\frac{12}{100} \times 100000$

$\times \frac{5}{12} = 5000$

Numbers of female watching Game of Thrones =

$\frac{28}{100} \times 100000 \times \frac{7}{20} = 9800$

Required difference = 9800 - 5000 = 4800

59. (b): Required angle = $\frac{28}{100} \times 360 = 100.8^\circ$

60. (e): Required % = $\frac{\left(\frac{24}{100} + \frac{16}{100} \right)}{\frac{20}{100} + \frac{28}{100} + \frac{12}{100}} \times 100$

= $\frac{40}{60} \times 100 = \frac{200}{3} \% = 66\frac{2}{3} \%$

61. (b): Let total number of items with 'A' be 100x

And total number of items with 'B' = 160x

Total item R with 'B' = $160x \times \frac{25}{100} = 40x$

Required percentage = $\frac{40x}{100x} \times 100 = 40\%$

62. (d): Let total items with 'A' & 'B' be a & b respectively

Total items Q with 'A' = 0.15a

Total items Q with 'B' = 0.30b

ATQ - $0.30b \times \frac{40}{100} = 0.15a$

$0.12b = 0.15a$

$b = 1.25a$

Required percentage = $\frac{1.25a - a}{a} \times 100 = 25\%$

63. (a): Let total number of items with 'B' be $100x$
Then, total number of items with 'A' = $140x$
ATQ -
 $100x \times \frac{10}{100} + 140x \times \frac{10}{100} = 384$
 $10x + 14x = 384$
 $x = 16$
Total number of items S with both 'A' & 'B'
together = $1600 \times \frac{20}{100} + 1600 \times \frac{140}{100} \times \frac{30}{100}$
 $= 320 + 672 = 992$

64. (e): Let total number of items with 'A' & 'B' be $3x$ & $4x$ respectively
Total number of items P with both 'A' & 'B'
together = $3x \times 0.20 + 4x \times 0.15 = 1.2x$
Required percentage = $\frac{1.2x}{7x} \times 100 = 17\frac{1}{7}\%$

65. (c): Let total number of items with 'A' be $100x$
Then, total number of items with 'B' = $180x$
ATQ -
 $100x \times \frac{25}{100} + 180x \times \frac{25}{100} = 840$
 $25x + 45x = 840$
 $x = 12$
Total number of items S with 'A' = $1200 \times \frac{30}{100} = 360$
Total number of items T with 'B' = $1200 \times \frac{180}{100} \times \frac{10}{100} = 216$
Required difference = $360 - 216 = 144$

66. (d): Total student doing master in English = 1440
Total number of students doing master in Biology and Hindi together
 $= \frac{1440}{72} \times 64.8 + \frac{1440}{72} \times 50.4$
 $= 1296 + 1008 = 2304$
Total number of students doing master in physics and math together
 $= \frac{1440}{72} \times 136.8 = 2736$
Required difference = $2736 - 2304 = 432$

67. (d): Females doing master in computer
 $= 360 \times \frac{4}{3} = 480$
Therefore, total student doing master in computer
 $= 360 + 480 = 840$
Total students doing master in English
 $= \frac{840}{36} \times 72 = 1680$
Females doing master in English = $1680 \times \frac{1}{5} = 336$
Required percentage = $\frac{480-336}{480} \times 100 = 30\%$

68. (d): Total student doing master in Biology
 $= \frac{540}{(100-40)} \times 100 = 900$
Student who failed in Biology = $900 \times \frac{40}{100} = 360$
Total student doing master in physics
 $= \frac{900}{64.8} \times 79.2 = 1100$
Required ratio = $\frac{360}{1100} = 18 : 55$

69. (c): Total student who are doing master in Maths
 $= 576 \times 2 = 1152$
Required average = $\frac{1}{3} \times \frac{1152}{57.6} \times (79.2 + 64.8 + 72)$
 $= 20 \times \frac{216}{3} = 20 \times 72 = 1440$

70. (e): Total student doing master = $1800 \times 6 = 10800$
Males doing master in English
 $= 10800 \times \frac{72}{360} \times \frac{2}{5} = 864$
Females doing master in Hindi
 $= 10800 \times \frac{2}{3} \times \frac{50.4}{360} = 1008$
Required percentage = $\frac{1008-864}{1008} \times 100$
 $= \frac{144}{1008} \times 100 = \frac{100}{7}\%$
 $= 14\frac{2}{7}\%$

Or

Males doing masters in English = $72 \times \frac{2}{5} = 28.8$
Females doing masters in Hindi = $50.4 \times \frac{2}{3} = 33.6$
 $= \frac{33.6-28.8}{33.6} \times 100$
 $= \frac{100}{7}\% = 14\frac{2}{7}\%$

71. (d): Total teachers in P = $(6000 \times \frac{20}{100} - 4000 \times \frac{20}{100})$
 $\times \frac{3}{16} = 75$
Total teachers in S = $(6000 \times \frac{25}{100} - 4000 \times \frac{36}{100}) \times \frac{1}{4} = 15$
Total boys in T = $4000 \times \frac{18}{100} = 720$
Required percentage = $\frac{(75+15)}{720} \times 100$
 $= 12.5\%$

72. (d): Total girls in Q = $(6000 \times \frac{15}{100} - 4000 \times \frac{14}{100}) \times \frac{14}{17} = 280$
Total girls in R = $(6000 \times \frac{10}{100} - 4000 \times \frac{12}{100}) \times \frac{3}{4} = 90$
Total boys in S = $4000 \times \frac{36}{100} = 1440$
Required ratio = $\frac{(280+90)}{1440} = 37 : 144$

- 73. (d):** Total (girls + teachers) in R
 $= \left(6000 \times \frac{10}{100} - 4000 \times \frac{12}{100} \right) = 120$
 Total (girls + teachers) in T
 $= \left(6000 \times \frac{30}{100} - 4000 \times \frac{18}{100} \right) = 1080$
 Required average $= \frac{(120+1080)}{2} = 600$
 Total boys in P $= 4000 \times \frac{20}{100} = 800$
 Required percentage $= \frac{800-600}{800} \times 100 = 25\%$
- 74. (b):** Total girls in T $= \left(6000 \times \frac{30}{100} - 4000 \times \frac{18}{100} \right) \times \frac{17}{24} = 765$
 And, Total teacher in T $= \left(6000 \times \frac{30}{100} - 4000 \times \frac{18}{100} \right) \times \frac{7}{24} = 315$
 Total girls in A $= 765 + 35 = 800$
 Total teacher and boys in T $= 4000 \times \frac{18}{100} + 315 = 1035$
 Total boys & teacher in A $= 800 \times \frac{60}{40} = 1200$
 Required difference $= 1200 - 1035 = 165$
- 75. (a):** Total (girls + teacher) in P
 $= 6000 \times \frac{20}{100} - 4000 \times \frac{20}{100} = 400$
 Total (girls + teachers) in Q
 $= 6000 \times \frac{15}{100} - 4000 \times \frac{14}{100} = 340$
 Total (girls + teachers) in R $= 6000 \times \frac{10}{100} - 4000 \times \frac{12}{100} = 120$
 Total girls in P, Q & R $= (400 + 340 + 120) - 180 = 680$
 Total boys in P, Q & R $= 4000 \times \frac{46}{100} = 1840$
 Required difference $= 1840 - 680 = 1160$
- 76. (d):** Let total budget allotted by government in the year 2016 and 2017 be 3x lakh cr. and 4x lakh cr respectively.
 ATQ-
 $\frac{3x \times 24}{100} \times \frac{7}{24} = 4935 \text{ lakh cr}$
 $x = 23500 \text{ lakh cr}$
 Total budget allotted for transport and road construction in the year 2017
 $= (4 \times 23500) \times \frac{24}{100}$
 $= 22560 \text{ lakh cr.}$
- 77. (e):** Let the total budget allotted in the year 2016 & 2017 be Rs. 3x lakh cr and Rs. 4x lakh. cr. respectively.
 $\frac{4x \times (16+14)}{100} - \frac{3x \times (22+14)}{100} = 9864 \text{ lakh cr.}$
 $1.2x - 1.08x = 9864 \text{ lakh. Cr.}$
 $x = \frac{9864}{0.12}$
 $x = 82200 \text{ lakh. Cr.}$

Total budget allotted for all the six sectors in the year 2016
 $= 3 \times 82200$
 $= 246600 \text{ lakh cr.}$

- 78. (b):** Let total budget allotted in the year 2016 & 2017 be Rs. 3x lakh cr and Rs. 4x lakh cr. respectively
 ATQ-
 Total budget allotted for renewable energy & agriculture and Allied industries sector in the year 2016
 $= \frac{3x \times (14+16)}{100}$
 $= \frac{90x}{100} \text{ lakh cr}$
 Total Budget allotted for banking and healthcare sector in the year 2017
 $= \frac{4x \times (14+10)}{100}$
 $= \frac{96x}{100} \text{ lakh cr.}$
 Required percentage
 $= \frac{\frac{96x}{100} - \frac{90x}{100}}{\frac{90x}{100}} \times 100$
 $= 6\frac{1}{4}\%$
- 79. (c):** Let the total budget allotted in the year 2016 & 2017 be Rs. 3x lakh cr and Rs. 4x lakh cr. respectively.
 Total budget allotted for railways and banking sector in the year 2017
 $= \frac{4x \times (22+14)}{100}$
 $= 1.44x \text{ lakh cr.}$
 Total budget allotted for agriculture and allied industries & transport and road construction sector in the year 2017
 $= \frac{3x \times (16+24)}{100}$
 $= 1.20x \text{ lakh cr}$
 Required ratio $= \frac{1.44x}{1.20x}$
 $= 6 : 5$
- 80. (a):** Let the total budget allotted in the year 2016 & 2017 be Rs. 3x lakh cr and Rs. 4x lakh cr respectively.
 ATQ-
 $\frac{4x \times 14}{100} - \frac{3x \times 10}{100} = 21372 \text{ lakh cr}$
 $56x - 30x = 21372 \text{ lakh cr}$
 $x = \frac{21372}{26}$
 $x = 82200 \text{ lakh cr.}$
 Required average
 $= \frac{(4 \times 82200) \times \frac{(22+24)}{100}}{2}$
 $= \frac{151248}{2}$
 $= 75624 \text{ lakh cr.}$

- 81. (e):** Watches sold in February = 3300
 $\Rightarrow 27.5\% \rightarrow 3300$
 $\Rightarrow 100\% \rightarrow 12000$
Watches sold in first six months = 12000
Watches sold in last six months
 $= 22500 - 12000 = 10500$
Required average $= \frac{1}{6} \times [10500] = 1750$
- 82. (c):** Watches sold in first six months of 2017
 $\frac{2}{5} \times 22500 = 9000$
Watches sold in April $= \frac{37.5}{100} \times 9000 = 3375$
Watches sold in March, May and June together
 $= (7\% + 7.5\% + 8\%) \times 9000$
 $= \frac{22.5}{100} \times 9000 = 2025$
Required difference $= 3375 - 2025 = 1350$
- 83. (a):** Total watches sold in 2018 $= \frac{110}{100} \times 22500 = 24750$
Watches sold in last six months of 2018
 $= \frac{1}{3} \times 24750 = 8250$
Watches sold in first six months of 2018
 $= 24750 - 8250$
 $= 16500$
 $\Rightarrow 100\% \rightarrow 16500$
Watches sold in June 2018 $= 8\% \rightarrow \frac{16500}{100} \times 8 = 1320$
Watches sold in June 2018 = 1320
- 84. (c):** Watches sold in May 2017 $= \frac{10}{3 \times 100} \times 22500 = 750$
 $\Rightarrow 7.5\% \rightarrow 750$
 $100\% \rightarrow 10000$
Watches sold in first six months of 2017 = 10,000
Watches sold in last six months of 2017
 $= 22,500 - 10,000 = 12,500$
- 85. (b):** ATQ,
Watches sold in February - Watches sold in January = 3000
 $\Rightarrow 27.5\% - 12.5\% \rightarrow 3000$
 $\Rightarrow 15\% \rightarrow 3000$
 $\Rightarrow 100\% \rightarrow 20000$
Watches sold in first six months = 20,000
Watches sold in last six months
 $= 22500 - 20000 = 2500$
Required percent $= \frac{2500}{22500} \times 100 = 11\frac{1}{9}\%$
- 86. (a):** Let total number of mouse manufactured by all six company in 2016 is 4x and in 2017 is 7x
ATQ -
 $7x \times \frac{(24+12)}{100} - 4x \times \frac{(25+10)}{100} = 4480$
 $\frac{63x}{25} - \frac{28x}{20} = 4480$

$$\frac{252x - 140x}{100} = 4480$$

$$112x = 4480 \times 100$$

$$x = \frac{4480 \times 100}{112}$$

$$x = 4000$$

Total number of mouse manufactured by Microsoft & Steel Series in 2017

$$= (4000 \times 7) \times \frac{(13+16)}{100}$$

$$= 8120$$

91. (a): In 2016,

$$\text{No. of HR managers in company D} = \frac{3}{8} \times 480 = 180$$

$$\text{No. of male HR managers in company D}$$

$$= \frac{3}{8} \times 180 = 108$$

$$\text{No. of female HR managers in company D}$$

$$= 180 - 108 = 72$$

$$\text{Newly recruited HR female managers} = 72 - 42 = 30$$

$$\text{No. of female HR managers who left} = 24$$

$$\text{Total no. of female HR managers in 2017}$$

$$= 72 - 24 + 30 = 78$$

$$\text{Req. percentage \%} = \frac{(78-72)}{72} \times 100$$

$$= \frac{6}{72} \times 100$$

$$= \frac{100}{12} = 8\frac{1}{3}\%$$

92. (b): No. of male HR managers in company A in 2016

$$= \frac{5}{12} \times \frac{25}{100} \times 480$$

$$= 50$$

$$\text{No. of male HR managers in company A in 2017}$$

$$= 50 - \left(\frac{1}{3} \times \frac{25}{100} \times 480 - 25 \right)$$

$$= 50 - (40 - 25)$$

$$= 35$$

$$\text{No. of male HR managers in company B}$$

$$= \frac{3}{4} \times \frac{12.5}{100} \times 480 + (40 - 25)$$

$$= 45 + 15$$

$$= 60$$

$$\text{Required \%} = \frac{35}{60} \times 100 = 58\frac{1}{3}\%$$

93. (c): No. of male HR managers in company C in 2016

$$= \frac{5}{9} \times \frac{15}{100} \times 480$$

$$= 40$$

$$\text{No. of female HR managers in company C in 2016}$$

$$= 72 - 40 = 32$$

$$\text{Total number of female HR managers in 2017 in company C} = 32 + 13 = 45$$

$$\text{Total no. of HR managers in company C in 2017}$$

$$= \frac{45}{9} \times (9 + 11)$$

$$= \frac{45}{9} \times 20$$

$$= 100$$

94. (d): No. of male HR managers in company D in 2017

$$= \left(\frac{75}{100} \times \frac{37.5}{100} \times 480 \right) \times \frac{8}{15}$$

$$= 72$$

$$\text{No. of female HR managers in company B in 2017}$$

$$= \left(\frac{140}{100} \times \frac{12.5}{100} \times 480 \right) \times \frac{5}{12}$$

$$= 35$$

$$\text{Required ratio} = \frac{72}{35}$$

$$\text{95. (c): Required \%} = \frac{\left(\frac{80}{100} \times \frac{25}{100} + \frac{75}{100} \times \frac{15}{100} \right) \times 480}{\frac{10}{100} \times 480} \times 100 \approx 300\%$$

96. (b): Let total population of city A = 5x

$$\Rightarrow \text{Total population of city B} = 2x$$

$$\text{ATQ,}$$

$$\frac{22}{100} \times 5x - \frac{28}{100} \times 2x = 945$$

$$1.1x - 0.56x = 945$$

$$\Rightarrow x = \frac{945}{0.54} = 1750$$

$$\text{Total population of city A} = 5 \times 1750 = 8750$$

$$\text{Total population of city B} = 2 \times 1750 = 3500$$

$$\text{Required number of persons}$$

$$= \frac{26 \times 8750}{100} + \frac{24}{100} \times 3500$$

$$= 2275 + 840$$

$$= 3115$$

97. (d): Total population of city A = 5x

$$\text{Total population of city B} = 2x$$

$$\text{ATQ,}$$

$$2x \times \frac{12}{100} = 456$$

$$\Rightarrow 2x = 3800$$

$$\text{Let number of males travel by car in city B} = y$$

$$\Rightarrow \text{Number of female travel by car in city B} = 1.25y$$

$$\text{ATQ,}$$

$$y + 1.25y = 3800 \times \frac{27}{100}$$

$$\Rightarrow y = \frac{1026}{2.25} = 456$$

$$\text{Number of males travel by car in city A}$$

$$= 456 \times 4$$

$$= 1824$$

$$\text{Total number of person travel by car in city A}$$

$$= \frac{28}{100} \times \frac{5}{2} \times 3800$$

$$= 2660$$

$$\text{Number of females travel by car in city A}$$

$$= 2660 - 1824 = 836$$

98. (c): Let, Total population of city A = 5x

$$\Rightarrow \text{Total population of city B} = 2x$$

$$\text{Total number of person travel by bike and metro together from city A}$$

$$= \frac{(22+16)}{100} \times 5x$$

$$= 1.9x$$

$$\text{Total number of person travel by bike and metro together from city B}$$

$$= \frac{(28+12)}{100} \times 2x$$

$$= 0.8x$$

$$\text{Required \%} = \frac{1.9x - 0.8x}{0.8x} \times 100$$

$$= \frac{1.1x}{0.8x} \times 100 = 137.5\%$$

99. (a): Let, Total population of city A = $5x$

⇒ Total population of city B = $2x$

ATQ,

$$\frac{27}{100} \times 2x - \frac{8}{100} \times 5x = 126$$

$$0.54x - 0.4x = 126$$

$$\Rightarrow x = \frac{126}{0.14} = 900$$

$$\text{Required average} = \frac{1}{2} \left[\frac{16}{100} \times 5 \times 900 + \frac{12}{100} \times 2 \times 900 \right]$$

$$= \frac{1}{2} [720 + 216] = \frac{936}{2}$$

$$= 468$$

100. (d): Let, Total population of city A = $5x$

⇒ Total population of city B = $2x$

ATQ,

$$2x - \frac{(22+16)}{100} \times 5x = 95$$

$$2x - 1.9x = 95$$

$$0.1x = 95$$

$$x = 950$$

Total population of city B = 1900

Total population of city A = 4750

$$\text{Required difference} = 1900 \times \frac{(12+9)}{100} - 4750 \times \frac{8}{100}$$

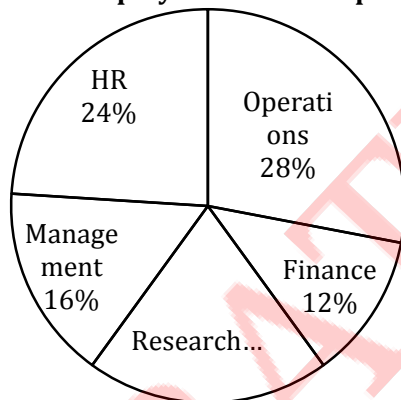
$$= 399 - 380 = 19$$

Practice MCQs for Mains

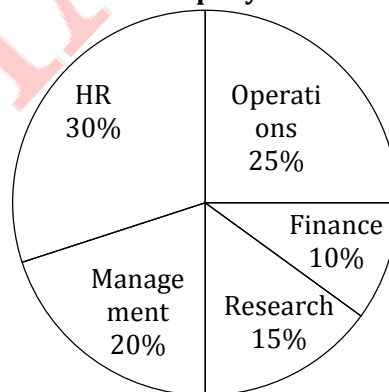
Directions (1-5): Study the pie charts given below and answer the following questions.

Pie charts show the percentage distribution of total employees of a company in 5 different departments (HR, Finance, Operations, Research and Management) and percentage distribution of total male employees of the company in these departments.

Total employees in the company



Total male employees in the company



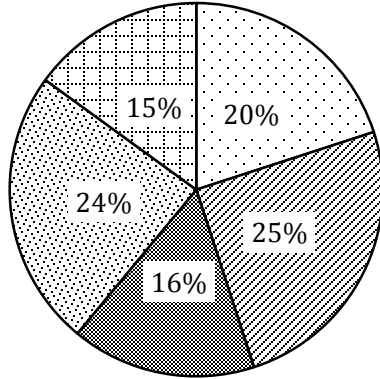
Note - Total employees in a department = Total (male + female) employees in that department.

- Female in Operations department is 170 more than that of in Research department. If female in Finance & Management department together is 670, then find the number of male employees in HR department.
(a) 300 (b) 225 (c) 375 (d) 450 (e) 150
- Total employees in Research and Management department together are 1200 more than total male employees in Finance and HR department together. If female employees in HR department are 30% of total employees in Research department, then find total male employees in the company.
(a) 5000 (b) 6500 (c) 5500 (d) 7000 (e) 6000
- Male employees in HR department are $42\frac{6}{7}\%$ of total employees in Operations department. If difference between female employees in Finance & Operations department is 750, then find female employees in HR department.
(a) 500 (b) 900 (c) 600 (d) 1200 (e) 1000
- Ratio of total male employees to total female employees in Operations and Research department together is 5 : 11. If female employees in HR department are 510, then find difference between total male employees and total female employees in the company.
(a) 1650 (b) 1300 (c) 750 (d) 1000 (e) 950

5. Average number of employees in Research, Management and HR is 200 more than average number of male employees in Operations, Research and Management. If female employees in Research department is 50 more than male employees in same department, then find total employees in the company.
 (a) 4000 (b) 5000 (c) 4500 (d) 3500 (e) 2500

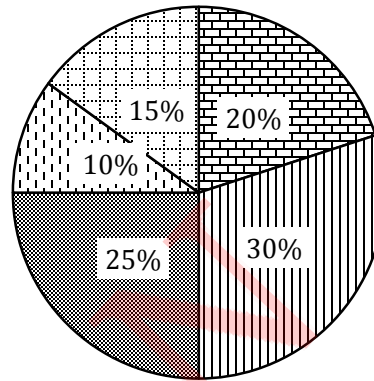
Direction (6- 10): Given below pie chart (I) shows distribution of total students (Engineering + Medical) in five college and pie chart (II) shows distribution of total students in Medical. Read the data carefully and answer the questions.

Total students (Engineering + Medical) = 4000



□ A □ B □ C □ D □ E

Total students (Medical) = 1800

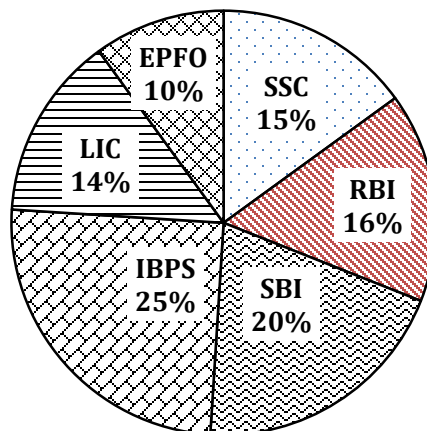


□ A □ B □ C □ D □ E

6. Find average of engineering students in A, C & E?
 (a) 420 (b) 480 (c) 360 (d) 300 (e) 320
7. Find the ratio of total engineering students in B & D together to total medical students in A & B together?
 (a) 74 : 45 (b) 68 : 45 (c) 52 : 45 (d) 62 : 45 (e) 64 : 45
8. If average of total engineering students in B, D & F is 600 and ratio of engineering students to medical students in F is 7 : 5, then find total students in F?
 (a) 1260 (b) 960 (c) 840 (d) 1200 (e) 1000
9. Find central angle for number of engineering students in A with respect to total students (Medical + Engineering) of all colleges?
 (a) 52.8° (b) 39.6° (c) 36° (d) 43.2° (e) None of these
10. Engineering students in E are what percent less than engineering students in A?
 (a) 25% (b) 20% (c) 15% (d) 10% (e) 5%

Direction (11-15): Pie-chart given below shows the percentage distribution of total vacancies announced by various departments. Study the pie-chart carefully and answer the following questions-

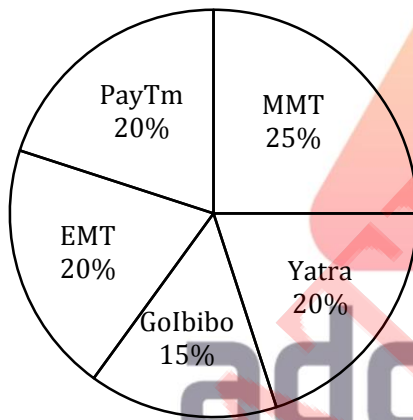
Total number of vacancies = 10000



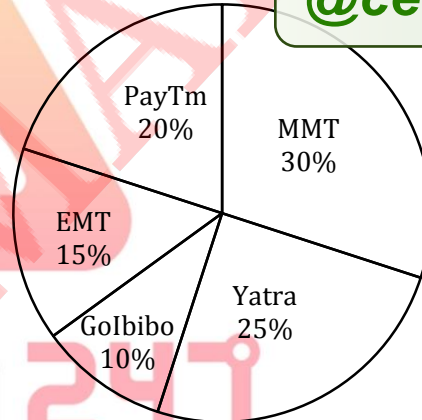
11. How many average vacancies are announced by SSC, RBI and IBPS? (approx.)
 (a) 1800 (b) 1850 (c) 1867 (d) 1900 (e) 1825
12. Vacancies announced by RBI are what percent less than the vacancies announced by SBI?
 (a) 18% (b) 19% (c) 20% (d) 21% (e) 22%
13. What is the central angle corresponding to vacancies announced by SBI and EPFO together?
 (a) 36° (b) 72° (c) 30° (d) 108° (e) 90°
14. If vacancies announced by SBI are reduced by 10% and vacancies announced by LIC are increased by $14\frac{2}{7}\%$, then find total number of vacancies announced by LIC.
 (a) 1600 (b) 1400 (c) 2400 (d) 1800 (e) 2000
15. Find total vacancies announced by EPFO, SSC and IBPS together.
 (a) 4500 (b) 5000 (c) 4000 (d) 5500 (e) 5250

Directions (16-20):- Given pie charts show the percentage distribution of persons who booked their flight tickets using different websites. Second pie chart shows the percentage distribution of Indigo flights booked through various websites.

% Distribution of websites used for ticket booking
Total bookings = 1000



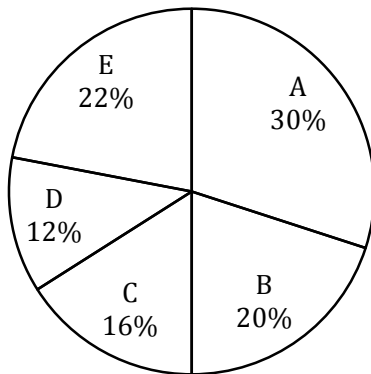
% Indigo flight booked using various websites
Total bookings = 400



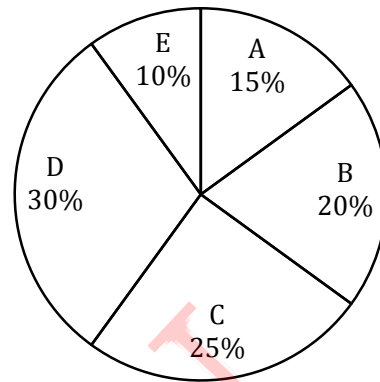
16. What is the ratio of Indigo bookings using Paytm to non-Indigo bookings using EMT?
 (a) 4:7 (b) 4:17 (c) 1:1 (d) 2:5 (e) 4:3
17. Indigo tickets booked using MMT & Yatra together are what percent of total tickets booked using Golbibo & PayTm together? (approx)
 (a) 64% (b) 61% (c) 155% (d) 160% (e) 63%
18. If there are 3 flight services booked using MMT i.e. Indigo, Air India & Spicejet. Air India bookings are 30% of Indigo bookings. What percent of total MMT bookings are of Spicejet?
 (a) 38.6% (b) $37\frac{4}{5}\%$ (c) $37\frac{3}{5}\%$ (d) 36.6% (e) 40%
19. golbibo bookings have increased by 20% in present month as compared to previous month of which Indigo bookings were only 20%. Find percent increase/decrease in non-Indigo bookings using Golbibo as compared to previous month. (data shown in chart is of present month)
 (a) 15% (b) 10% (c) 20% (d) 5% (e) 50%
20. At PayTm, indigo ticket is priced at Rs. 4000 while Spicejet ticket is priced at Rs. 5000. If only indigo, spicejet & air asia tickets are available at Paytm and no ticket left unsold. Find the ticket price of air asia if average ticket price at Paytm is Rs. 5000.
 (indigo tickets : spicejet tickets = 8:7) (in Rs.)
 (a) 7200 (b) Cannot be determined (c) 6000
 (d) 6600 (e) None of these

Directions (21-25): Pie charts given below shows percentage distribution of total consumers of Coffee, Tea & Cold drinks together of 5 different companies (A, B, C, D & E) and percentage distribution of total consumers of Tea in these 5 companies.

Total consumers (Coffee, Tea & Cold drinks) = 15000



Total consumers (Tea) = 6000

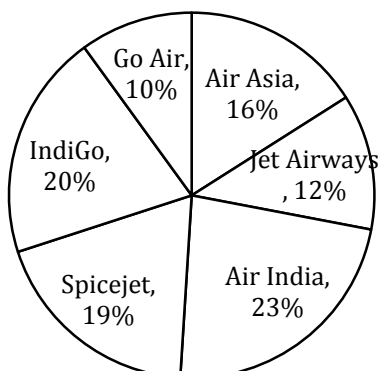


Note – Each consumer consumes either Coffee or Tea or Cold drinks.

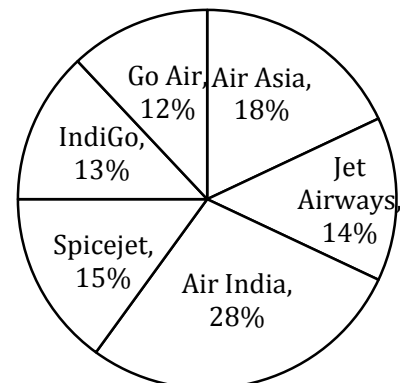
- 21.** If consumers of Cold drinks in A are 25% more than consumers of Coffee in A, then find consumers of Coffee in A are what percent more or less than consumers of Tea in D & E together?
 (a) $28\frac{1}{3}\%$ (b) $33\frac{1}{3}\%$ (c) $54\frac{1}{3}\%$ (d) $38\frac{1}{3}\%$ (e) $44\frac{2}{3}\%$
- 22.** Find the central angle of total consumers of Tea in A & C together out of total tea consumer only.
 (a) 136° (b) 140° (c) 132° (d) 128° (e) 144°
- 23.** If consumers of Coffee in C are 25% more than consumers of Tea in E, then find consumers of Coffee in C & D together are how much more or less than consumers of Tea in A?
 (a) 160 (b) None of the given options (c) 180 (d) 150 (e) 130
- 24.** Consumers of Coffee and Cold drinks in B & C together are what percent of average number of consumers of Tea in B, C & D?
 (a) 120% (b) 150% (c) 180% (d) None of the given options (e) 140%
- 25.** If ratio of consumers of Coffee to consumers of Cold drinks in B & E is 7 : 5 and 11 : 7 respectively, then find consumers of Coffee in B & E together are what percent more or less than consumers of Cold drinks in B & E together?
 (a) 50% (b) None of the given options (c) 30%
 (d) 140% (e) 80%

Direction (26-30): Pie chart given below shows percentage distribution of passengers travelling by six different airlines from India to Thailand and to Arab Emirates in year 2017. Study the pie chart carefully and answer the questions.

Thailand



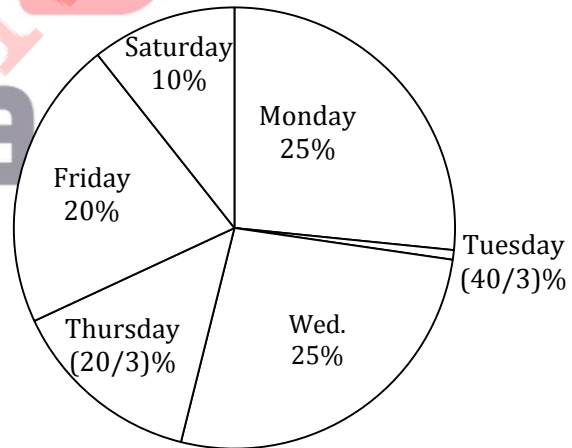
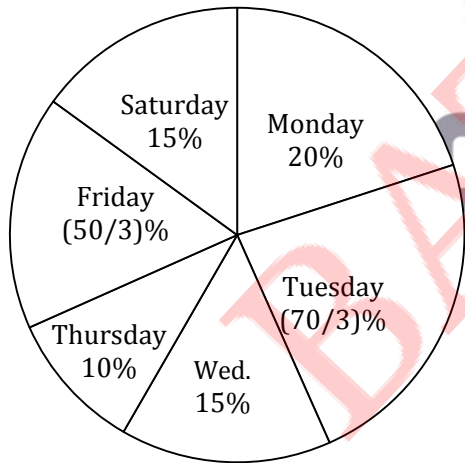
Arab Emirates



Note: Total number of passengers travelling from India to Thailand and to Arab Emirates are in the ratio of 1 : 2 in 2017.

26. If difference between total number of passengers travelling to Thailand by IndiGo & Spicejet together and total number of passengers travelling to Arab Emirates by Air India & Jet Airways together is 1350. Find total numbers of passengers travelling by Air Asia Airlines to both the countries?
 (a) 1260 (b) 1360 (c) 1460 (d) 1560 (e) 1160
27. Ratio between tourists passenger to residential passenger travelling to Thailand by IndiGo is 2 : 3 and to Arab Emirates by Air India is 2 : 5. If difference between tourists passengers travelling to both the countries is 240, find total passenger travelling to both countries in 2017?
 (a) 8000 (b) 9000 (c) 7000 (d) 9500 (e) 9750
28. Out of total passengers travelling to Arab Emirates by Spice Jet, 60% are residential of three states of India i.e. U.P, Bihar and M.P which are in ratio 5 : 2 : 2 respectively. If difference between total passengers travelling to Arab Emirates by Spice Jet from U.P and total number of passengers travelling to Thailand by Jet Airways is 60. Then find total number of passengers travelling to Thailand by Air India & Go Air together?
 (a) 960 (b) 950 (c) 970 (d) 940 (e) 990
29. Find total number of passengers travelling to Arab Emirates by Air India & Jet Airways together is what percent more/less than total passengers travelling to Thailand by Indi Go, Air India and Spicejet together, if given total number of passengers travelling to Thailand by Jet Airways is 360?
 (a) $35\frac{15}{31}\%$ (b) $42\frac{17}{31}\%$ (c) $27\frac{3}{5}\%$ (d) $58\frac{15}{31}\%$ (e) $54\frac{3}{4}\%$
30. Total passengers travelling to both countries by Air India is 2370, then what is the ratio between passengers travelling to Thailand by Air India & IndiGo together to passenger travelling to Arab Emirates by IndiGo & Spicejet together?
 (a) 44 : 57 (b) 47 : 57 (c) 43 : 56 (d) 41 : 53 (e) 45 : 67

Directions (31-35): Given below are two pie-charts which shows the percentage distribution of employees in Adda247 who travel to their office in Gurgaon by two different means i.e. by metro and by cab on different days of week. First pie chart shows data for Metro and second pie chart shows data for Cab

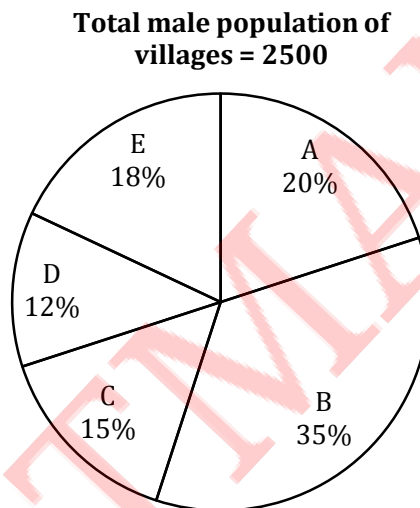


Note:

- Ratio of total employees travelling to Gurgaon by metro to by cab is 5 : 4.
 - If difference of persons travelling by metro and by cab on Saturday is 420.
31. If number of employees travelling on Sunday by cab decreases by 'Y' with respect to employees travelling on Friday by cab and number of employees travelling on Sunday by metro is twice than that of travelling on Friday by metro. Then find value of 'Y'? (Given that total employees on Sunday is 75% of total employees on wed.)
 (a) 1280 (b) None of these (c) 1385 (d) 1415 (e) 1255
32. What is the difference of number of employees travelling by metro on Wednesday and Thursday together and number of employees travelling by cab on same days together?
 (a) 50 (b) 20 (c) None of these (d) 40 (e) 60

- 33.** If total fare per person travelling by metro & cab are Rs.120, then ratio of total amount spent on Thursday by all employees travelling by cab to total amount spent by all employees on same day travelling by metro? (given that ratio of fare per person travelling by metro to by cab is 5 : 7)
 (a) 21 : 23 (b) 56 : 73 (c) None of these (d) 56 : 75 (e) 53 : 73
- 34.** If total fare on Monday by all employees travelling by metro is Rs. 48000. Then find the total fare on same day by all employees travelling by cab? (if per person fare for each employee is same)
 (a) Rs. 48000 (b) Rs. 42000 (c) Rs. 56000 (d) None of these (e) Rs. 26000
- 35.** Total number of employees travelling by metro on Friday and Saturday together is approximately what percent more or less than number of employees travelling by cab on same days together?
 (a) 48% (b) 28% (c) 42% (d) 38% (e) 32%

Directions (36-40): Pie chart given below shows percentage distribution of male population of five villages. Study the pie chart carefully and answer the following questions.

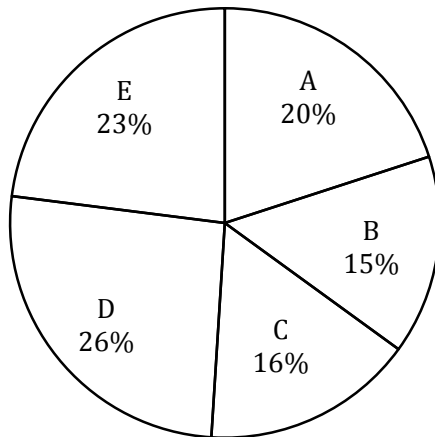


Note: Ratio between the total male population to total female population of the given villages is 10 : 7.

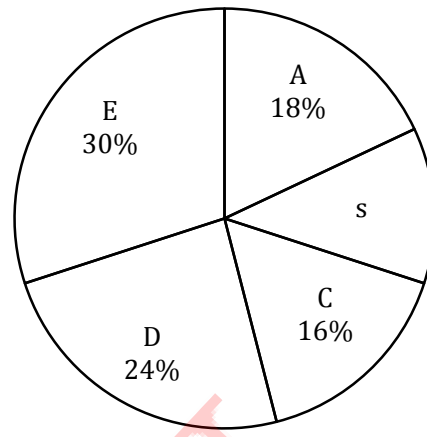
- 36.** If the ratio between the male population to female population of village B is 7 : 3 then the female population of village B is what percent of the total female population of given villages ?
 (a) $19\frac{1}{7}\%$ (b) $21\frac{3}{7}\%$ (c) $23\frac{4}{7}\%$ (d) $27\frac{1}{3}\%$ (e) $35\frac{3}{7}\%$
- 37.** Total male population of village A is what percent more/less than the total female population of village D and E together if ratio between male to female population of village D and E is 4 : 5 and 6 : 7 respectively?
 (a) $77\frac{7}{9}\%$ (b) $66\frac{2}{3}\%$ (c) $55\frac{5}{9}\%$ (d) $44\frac{4}{9}\%$ (e) $33\frac{1}{3}\%$
- 38.** Find the difference between the average female population of village B and C together and the average female population of D and E together if percentage distribution of male and female in each village is same?
 (a) 150 (b) 200 (c) 175 (d) 300 (e) 250
- 39.** Ratio of female population of village C to that of village D is 2 : 3 and the ratio of female population of village D to male population of village E is 4 : 5 then find the total female population of village D and C together ?
 (a) 300 (b) 750 (c) 120 (d) 450 (e) 600
- 40.** Male population of village G is $7\frac{7}{9}\%$ more than the male population of village E while female population of village G is $2\frac{6}{7}\%$ more than the male population of village 'B'. Find total population of village G?
 (a) 1285 (b) 1245 (c) 1345 (d) 1385 (e) 1445

Directions (41-45): Following pie charts show the percentage distribution of males and females in five companies. Study the charts carefully to answer the questions that follow.

Distribution of males



Distribution of females

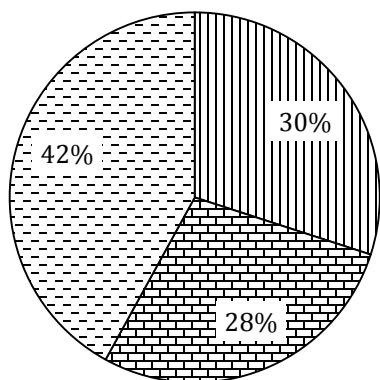


41. If ratio of between number of females to number of males in company B is 32 : 45 then number of males in company E is what percent more than the number of females in company C.(approx.)
 (a) 53% (b) 62% (c) 65% (d) 80% (e) 75%
42. If the average of total male and females of all the company together is 21000 and difference between male to female in company C is 320(no. of males > no. of females) then find the total females in company A.
 (a) 3422 (b) 3500 (c) 3420 (d) 2000 (e) none of these
43. Find the average of number of males in company D and company C and females in company B if ratio of total number of males to total number of females is 3:2 and number of males in the company D is 3900.
 (a) 2500 (b) 1500 (c) 1600 (d) 1700 (e) 2600
44. If ratio between total females to total males is $x^3 : (x + 1)^2$ (x is a whole number), then find the minimum possible value of x , given that number of males in company A is 25% more than the number of females in the same company.
 (a) 4 (b) 1 (c) 6 (d) 3 (e) 2
45. Ratio between average of number of male of company A, B and C to the average of number of females of company A, B and E is 51 : 65 then total females are how much percent more than total males.
 (a) 8.45% (b) 7.34% (c) 7.14% (d) 8.33% (e) 9.33%

Directions (46-50): In the given pie chart, in state Bank of India there are two types of accounts NRE account and NRO account which can be opened by a foreigner.

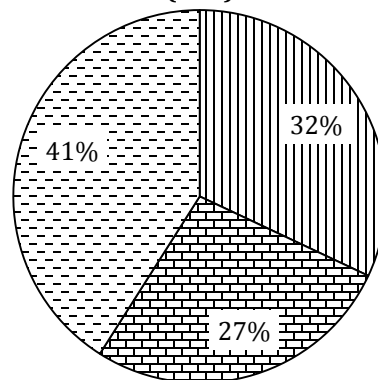
These pie charts show the percentage wise breakup of these accounts spend in a given year. There are 4 quarters in a year and graph shown the information about three quarters.

NRE Account (750)



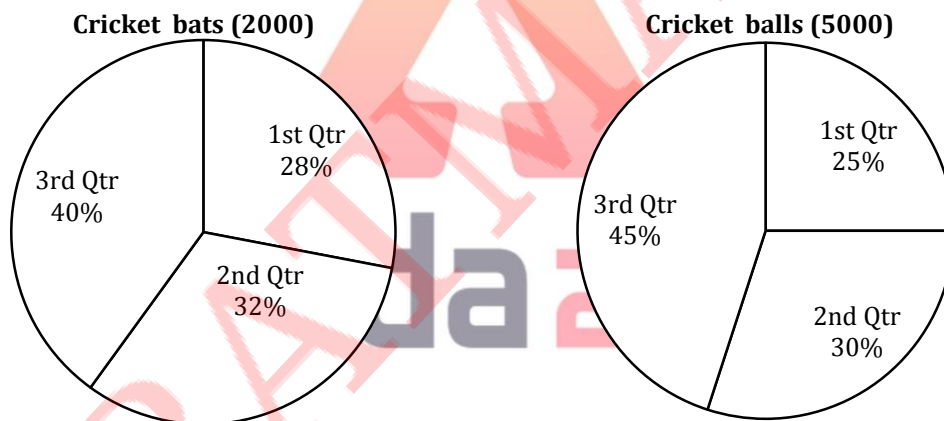
- I Quarter
 ■ II Quarter
 ■ III Quarter

NRO Account (500)



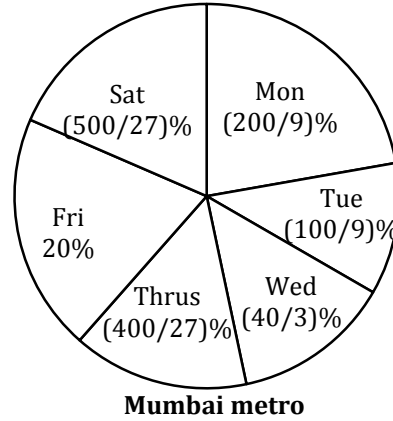
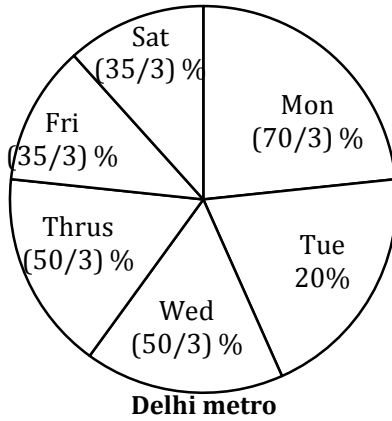
46. If we include the 4th quarter in the given year, percentage of NRO accounts opened in 2nd quarter will become $16\frac{7}{8}\%$ of the total NRO accounts opened during the whole year. Then what is the number of NRO accounts opened in 4th quarter?
 (a) 450 (b) 300 (c) 350 (d) 250 (e) 260
47. Total number of NRE accounts opened in the 4th quarter are $42\frac{6}{7}\%$ more than the NRE accounts opened in 3rd quarter, then find the average number of NRE accounts opened during whole year if the NRE accounts opened in 4th quarter are 50% more than the NRO accounts opened in 4th quarter?
 (a) 325 (b) 200 (c) 350 (d) 250 (e) 300
48. If the total number of NRE accounts opened in the whole year are 50% more than the NRO account opened in the whole year then find the ratio of the NRE accounts opened in 4th quarter to NRO accounts opened in 4th quarter?
 (a) 2 : 3 (b) 2 : 5 (c) 3 : 2
 (d) Can't be determined (e) None of these
49. If the NRE accounts opened in IVth quarter is 240 more than the NRE accounts opened in 2nd quarter, then NRE accounts opened in 4th quarter is what percent of the total NRE accounts opened in the whole year?
 (a) 37.5% (b) 39.5% (c) 35.5% (d) 36% (e) 34.6%
50. If 16 % NRE account holders and 18% NRO account holders close their account then total no. of NRE accounts in 2nd and 3rd quarter is approximately what percent more than the total no. of NRO accounts in these quarters respectively?
 (a) 36 % (b) 45 % (c) 52 %
 (d) Can't be determined (e) None of these

Directions (51-55): The given pie graphs show the percentage wise breakup of production of cricket bats and cricket balls in a given year. There are 4 quarters in a year and graph shows the information for three quarters.



51. If we include the 4th quarter of the year, percentage of cricket bats in 1st quarter will become 25% of the total cricket bats produced during the whole year. Then what is the number of cricket bats in 4th quarter?
 (a) 260 (b) 230 (c) 280 (d) 240 (e) 250
52. If the Cricket balls produced in 4th quarter is $\frac{1}{3}$ less than the Cricket balls produced in 2nd quarter. Then Cricket balls produced in 4th quarter is what percent of total number of Cricket balls produced. (up to 2 decimal places).
 (a) 25% (b) 16.67% (c) 14.28% (d) 33.33% (e) 22.22%
53. Total no of cricket bats produced in 2nd and 3rd quarter is what percent of total no. of the Cricket balls produced in 2nd and 3rd quarter?
 (a) 39.23% (b) 38.4% (c) 37.6% (d) 33.33% (e) 41.15%
54. Average number of cricket bats produced in 1st and 2nd quarter is how much percent more or less than the number of cricket balls produced in 3rd quarter? (up to 2 decimal places).
 (a) 73.33% (b) 72.16% (c) 26.67% (d) 27.84% (e) 71.84%
55. If the production of cricket balls in 4th quarter is 35% more than that of cricket bats in 2nd quarter and production of cricket bats in 4th quarter is 25% less than the production of cricket balls in 4th quarter, then the production of cricket bats in 2nd quarter is what % of total production of cricket bats taking all the quarter together. (up to 2 decimal points)
 (a) 23.52% (b) 24.17% (c) 26.37% (d) 23.92% (e) 24.96%

Directions (56-60): Given below are the two pie charts which shows the percentage distribution of people who travel a certain distance in Delhi metro and Mumbai metro on six different days of the week starting from Monday to Saturday.

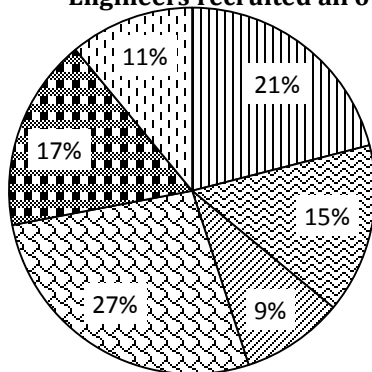


Note:

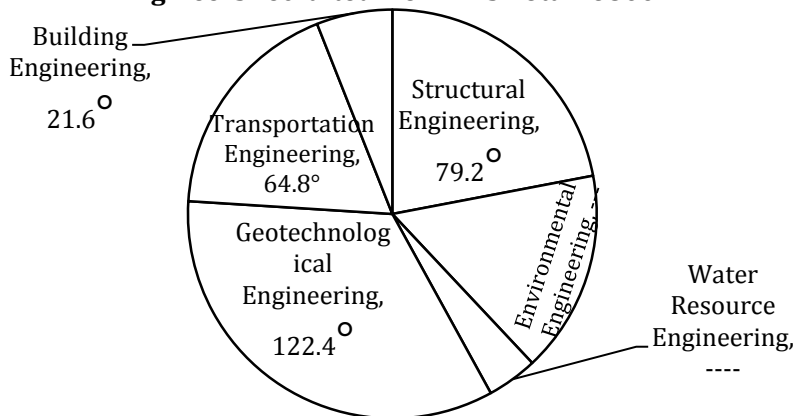
- Ratio of total person travelling in these six days in Delhi metro to Mumbai metro is 10 : 9
 - Difference between person travelling in Delhi metro and Mumbai metro on Wednesday is 70.
- 56.** If fare per person in Delhi metro and Mumbai metro on all days for the particular distance is Rs. 18 and Rs. 20 respectively then what is the difference between total fare obtained by both metro on Saturday.
 (a) 1375 (b) 1750 (c) 1850 (d) 1700 (e) 1650
- 57.** If in both metro, number of people travelling on Sunday of same week decreases by 'x' with respect to people travelling on Saturday then the ratio of people travelling in Delhi metro to Mumbai metro on Sunday is 2 : 3, then find the value 'x'
 (a) 20 (b) 30 (c) 22 (d) 24 (e) 25
- 58.** Number of people travelling in Delhi metro on Wednesday and Thursday together is what percent of people travelling in Mumbai metro on Monday and Saturday together?
 (a) $90\frac{10}{11}\%$ (b) $89\frac{10}{11}\%$ (c) $90\frac{2}{11}\%$ (d) $92\frac{8}{11}\%$ (e) $95\frac{5}{11}\%$
- 59.** If fare per person of Delhi metro to Mumbai metro is 10 : 9 on all days and sum of fare obtained from both metro on Tuesday is Rs. 4350, then total fare obtained from Delhi metro on Monday is what percent more or less than total fare obtained from Mumbai metro on Saturday.
 (a) $46\frac{4}{9}\%$ (b) $45\frac{4}{9}\%$ (c) $55\frac{5}{9}\%$ (d) $54\frac{4}{9}\%$ (e) $52\frac{5}{9}\%$
- 60.** If on Sunday of same week, person who travel by Delhi metro and Mumbai metro are increased by 20% and 30% respectively over Saturday, then total people who travelled by both metro on Sunday is what percent of total people who travelled by both metro on Monday.
 (a) $81\frac{5}{17}\%$ (b) $87\frac{2}{13}\%$ (c) $93\frac{4}{15}\%$ (d) $82\frac{4}{13}\%$ (e) $78\frac{3}{13}\%$

Direction (61-65): L&T pvt limited recruited civil engineers for Infrastructure Project in different streams from all over the India. But it fixes some seats for engineers from IITs. The information, regarding this is given below

Engineers recruited all over the world Total=12600



- ☐ Structural Engineering
- ☒ Environmental Engineering
- ☒ Water Resource Engineering
- ☒ Geotechnological Engineering
- ☒ Transportation Engineering
- ☐ Building Engineering

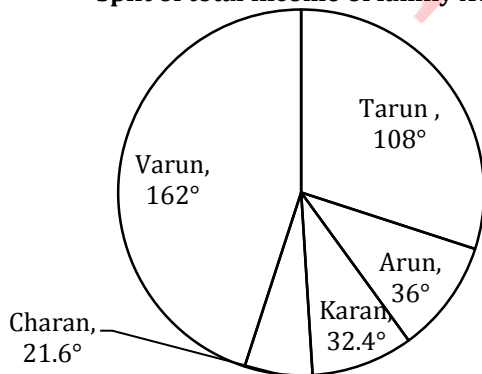
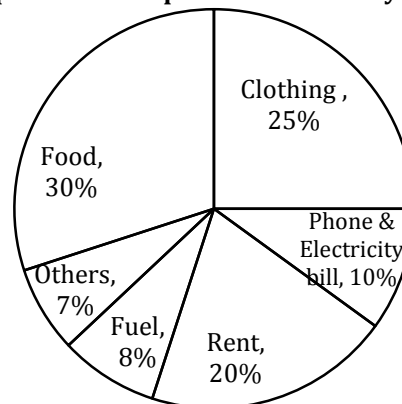
Engineers recruited from IITs Total=6800

NOTE: - SOME VALUES ARE MISSING. YOU HAVE TO CALCULATE THESE VALUES ACCORDING TO QUESTION.

- 61.** Engineers Recruited by company except from IITs in stream Geotechnological Engineering 30% are master degree holders and Engineers recruited from IITs in Building Engineering 25% are master degree holders. Then find the ratio of engineers recruited from non-IIT in Geotechnological Engineering having master degree to Engineers recruited from IITs in building Engineering having master degree?
 (a) 106 : 39 (b) 107 : 35 (c) 109 : 34 (d) 101 : 31 (e) 105 : 32
- 62.** If the number of engineers recruited from IITs in Environmental and water Resource Engineering are in ratio of 4 : 1, then how many Engineers recruited in Environmental Engineering are non-IITians ?
 (a) 804 (b) 802 (c) 799 (d) 796 (e) 792
- 63.** Number of Transport Engineers recruited by the company from IIT by what percent more than the number of non – IITian Transport Engineers recruited by company?
 (a) $33\frac{1}{3}\%$ (b) $33\frac{2}{3}\%$ (c) $32\frac{1}{3}\%$ (d) $32\frac{2}{3}\%$ (e) 34%
- 64.** If in structural Engineering, the ratio of Engineers from IITs and non-IITs should be 1 : 1. Then by what percent less it should recruit Engineers from IITs in structural Engineering.
 (a) 14.29% (b) 12.78% (c) 10.31% (d) 11.56% (e) 15.29%
- 65.** Average number of non-IITian Engineers recruited in Geotechnological and Transportation Engineering, taking together?
 (a) 1298 (b) 1004 (c) 1678 (d) 928 (e) 1238

Direction (66-70): Answer the questions on the basis of the following information.

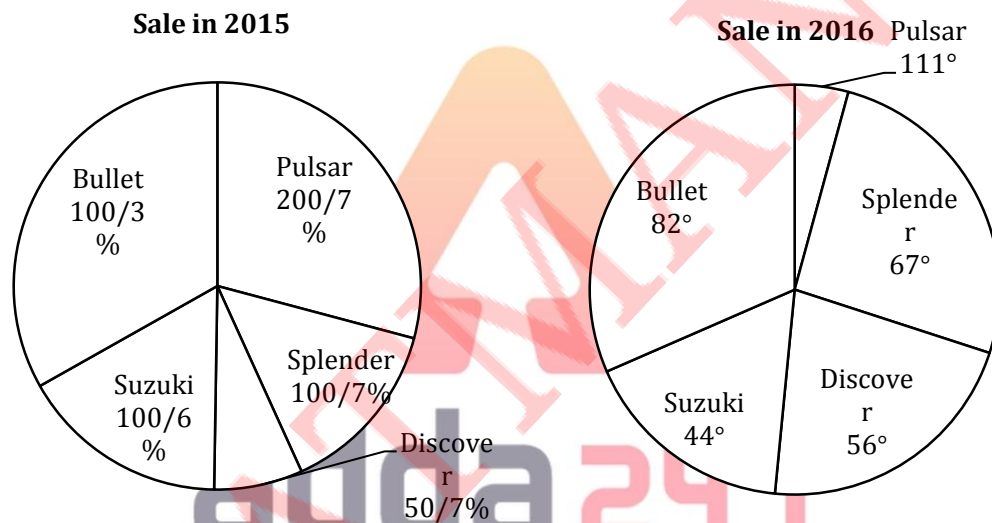
The following pie charts gives the breakup of the income of all the five members – Varun, Tarun, Arvind, karan and Charan of family XYZ and the breakup of the total family expenditure under different heads.

Split of total income of family XYZ**Split of total expenditure of family XYZ**

Note: The total income of the family is equal to the total expenditure and the family has no other sources of income. In question head means individual part of expenditure i.e., clothing, rent, fuel etc.

66. If Varun did not pay for "others", then his income can fully account for expenses under at most how many heads?
 (a) 2 (b) 3 (c) 4 (d) 5 (e) 6
67. Whenever possible, if all the expenses under one head is paid by a single person, the number of heads under which more than one person shared the expenses is at least
 (a) 1 (b) 2 (c) 3 (d) 4 (e) 5
68. If Varun does not spend any amount on food, then the expenditure of Varun on clothing and rent as a percentage of the total expenditure on rent and clothing cannot be less than
 (a) 33.33% (b) 44.44% (c) 25% (d) 66.66% (e) 54.44%
69. If at most 40% of the income of each person is paid for food, then the number of persons who did not pay for food is at most
 (a) 1 (b) 2 (c) 3 (d) 4 (e) 6
70. If at least 5% of the total expenses under each head is paid from Karan's income, then the percentage share of Karan's payment under any head can be a maximum of
 (a) 22.5% (b) 90% (c) 62.14% (d) $66\frac{2}{3}$ (e) 61.24%

Directions (71-75): Given below are the two pie charts. Pie chart I shows the percentage distribution of different models of bike sold in year 2015 and pie chart II shows the sale of these models of bike in 2016 in degree.



71. If ratio of total sale in 2015 to the total sale in 2016 is 4 : 5 then sale of pulsar in 2016 increases or decreases by what percentage in comparison to sale of Pulsar in 2015. ?
 (a) 35% (b) 30% (c) 43% (d) 52% (e) 24%
72. If total sale in 2015 is 84000 and total sale of bikes in 2016 is increased by 20% then find the difference in sale of bike splender in 2015 and 2016.
 (a) 5530 (b) 6250 (c) 6760 (d) 5230 (e) None of these
73. If the ratio of sale of pulsar in 2015 to sale of Bullet in 2016 is 3 : 7 then sale of discover in 2016 is what percent of sale of Suzuki in 2015 (approximately)
 (a) 238% (b) 242% (c) 217% (d) 273% (e) 222%
74. If selling price of Suzuki per bike in 2015 is 45000 and selling price of Suzuki per bike in 2016 is 54000 then what is the ratio of total selling price of Suzuki in 2015 to the total selling price of Suzuki in 2016. If ratio of total sale in 2015 to total sale in 2016 is 2 : 3.
 (a) $\frac{25}{33}$ (b) $\frac{36}{37}$ (c) $\frac{24}{29}$ (d) $\frac{18}{23}$ (e) None of these
75. If total sale of all bikes in 2015 and in 2016 are equal then sale of Bullet in 2015 is what percent more or less than sale of Bullet in 2016 (approximately)
 (a) 40% (b) 32% (c) 38% (d) 43% (e) 46%

Practice MCQs for Mains_(Solutions)

1. (d): Let total employees in company be $100x$ and let total male employees in the company be $100y$.

ATQ,

$$\left(\frac{28}{100} \times 100x - \frac{25}{100} \times 100y\right) - \left(\frac{20}{100} \times 100x - \frac{15}{100} \times 100y\right) = 170$$

$$28x - 25y - 20x + 15y = 170$$

$$8x - 10y = 170 \quad \dots(i)$$

$$\text{And, } \left(\frac{12}{100} \times 100x - \frac{10}{100} \times 100y\right) + \left(\frac{16}{100} \times 100x - \frac{20}{100} \times 100y\right) = 670$$

$$12x - 10y + 16x - 20y = 670$$

$$28x - 30y = 670 \quad \dots(ii)$$

On solving (i) & (ii), we get:

$$x = 40, y = 15$$

$$\text{Required male employees} = \frac{30}{100} \times 100 \times 15 = 450$$

2. (e): Let total employees in company be $100x$ and let total male employees in the company be $100y$.

ATQ,

$$\left(\frac{20+16}{100} \times 100x\right) - \left(\frac{10+30}{100} \times 100y\right) = 1200$$

$$36x - 40y = 1200 \quad \dots(i)$$

Now, female employees in HR department =

$$\left(\frac{24}{100} \times 100x - \frac{30}{100} \times 100y\right)$$

$$= 24x - 30y$$

$$\text{Now, } \frac{24x-30y}{\frac{20}{100} \times 100x} = \frac{30}{100}$$

$$\frac{24x-30y}{20x} = \frac{3}{10}$$

$$18x = 30y$$

$$y = 0.6x \quad \dots(ii)$$

On solving (i) & (ii), we get:

$$x = 100, y = 60$$

$$\text{Required male employees} = 100 \times 60 = 6000$$

3. (b): Let total employees in company be $100x$ and let total male employees in the company be $100y$.

So, male employees in HR department = $100y \times \frac{30}{100}$

$$= 30y$$

And, total employees in Operations department =

$$100x \times \frac{28}{100}$$

$$= 28x$$

ATQ,

$$\frac{30y}{28x} = \frac{300}{700}$$

$$x = 2.5y$$

Now, female employees in Finance department =

$$\left(\frac{12}{100} \times 100x\right) - \left(\frac{10}{100} \times 100y\right)$$

$$= 12x - 10y$$

$$= 30y - 10y \quad (x = 2.5y)$$

$$= 20y$$

And, female employees in Operations department

$$= \left(\frac{28}{100} \times 100x\right) - \left(\frac{25}{100} \times 100y\right)$$

$$= 28x - 25y$$

$$= 70y - 25y \quad (x = 2.5y)$$

$$= 45y$$

$$\text{Now, } (45y - 20y) = 750$$

$$y = 30$$

$$\text{And, } x = 75$$

$$\text{Required female employees} = \left(\frac{24}{100} \times 100 \times 75\right) -$$

$$\left(\frac{30}{100} \times 100 \times 30\right)$$

$$= 1800 - 900$$

$$= 900$$

4. (d): Let total employees in company be $100x$ and let total male employees in the company be $100y$.

So, total female employees in Operations and Research department together

$$= \left(\frac{28}{100} \times 100x - \frac{25}{100} \times 100y\right) + \left(\frac{20}{100} \times 100x - \frac{15}{100} \times 100y\right)$$

$$= 28x - 25y + 20x - 15y$$

$$= 48x - 40y$$

And, total male employees in Operations and Research department together = $\frac{25+15}{100} \times 100y$

$$= 40y$$

ATQ,

$$\frac{40y}{48x-40y} = \frac{5}{11}$$

$$\frac{x}{y} = \frac{8}{3}$$

$$\frac{x}{y} = \frac{8}{3}$$

Let x & y be $8a$ & $3a$ respectively.

$$\text{Now, } \left(\frac{24}{100} \times 100 \times 8a\right) - \left(\frac{30}{100} \times 100 \times 3a\right) =$$

$$510$$

$$a = 5$$

Hence, total male employees in the company =

$$100 \times 3 \times 5$$

$$= 1500$$

And, total female employees in the company =

$$100 \times 8 \times 5 - 1500$$

$$= 2500$$

$$\text{Required difference} = 2500 - 1500$$

$$= 1000$$

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5. (e): Let total employees in company be $100x$ and let total male employees in the company be $100y$.
 ATQ,
 $\left(\frac{1}{3} \times \frac{(20+16+24)}{100} \times 100x\right) - \left(\frac{1}{3} \times \frac{25+15+20}{100} \times 100y\right) = 200$
 $20x - 20y = 200$
 $x - y = 10 \quad \dots(i)$
 Now, female employees in Research department
 $= \left(100x \times \frac{20}{100}\right) - \left(100y \times \frac{15}{100}\right)$
 $= 20x - 15y$
 And, male employees in Research department =
 $\left(100y \times \frac{15}{100}\right)$
 $= 15y$
 Now,
 $20x - 15y - 15y = 50$
 $2x - 3y = 5 \quad \dots(ii)$
 On solving (i) & (ii), we get:
 $x = 25, y = 15$
 So, required employees = $100x$
 $= 2500$
6. (e): Engineering students in
 $A = 4000 \times \frac{20}{100} - 1800 \times \frac{20}{100}$
 $= 800 - 360 = 440$
 Engineering students in
 $C = 4000 \times \frac{16}{100} - 1800 \times \frac{25}{100}$
 $= 640 - 450 = 190$
 Engineering students in
 $E = 4000 \times \frac{15}{100} - 1800 \times \frac{15}{100}$
 $= 600 - 270 = 330$
 Required average = $\frac{440+190+330}{3}$
 $= \frac{960}{3} = 320$
7. (d): Engineering students in B & D together = $\left(4000 \times \frac{25}{100} - 1800 \times \frac{30}{100}\right) + \left(4000 \times \frac{24}{100} - 1800 \times \frac{10}{100}\right)$
 $= (1000 - 540) + (960 - 180) = 1240$
 Medical students in A & B together = $1800 \times \frac{20}{100} + 1800 \times \frac{30}{100}$
 $= 360 + 540 = 900$
 Required ratio = $1240 : 900 = 62 : 45$
8. (b): Total engineering students in B, D & F together = $600 \times 3 = 1800$
 Engineering students in F
 $= 1800 - \left[\left(4000 \times \frac{25}{100} - 1800 \times \frac{30}{100}\right) + \left(4000 \times \frac{24}{100} - 1800 \times \frac{10}{100}\right)\right]$
 $= 1800 - (460 + 780)$
 $= 560$
 Medical students in F = $560 \times \frac{5}{7} = 400$
 Total students in F = $(560 + 400) = 960$

9. (b): Engineering students in A = $\left(4000 \times \frac{20}{100} - 1800 \times \frac{20}{100}\right) = 440$
 Required central angle = $\frac{440}{4000} \times 360 = 39.6^\circ$
10. (a): Engineering students in
 $A = 4000 \times \frac{20}{100} - 1800 \times \frac{20}{100}$
 $= 800 - 360 = 440$
 Engineering students in
 $E = 4000 \times \frac{15}{100} - 1800 \times \frac{15}{100}$
 $= 600 - 270$
 $= 330$
 Required percentage = $\frac{440-330}{440} \times 100$
 $= \frac{110}{440} \times 100 = 25\%$
11. (c): Vacancies announced by SSC, RBI, and IBPS together = $(15+16+25)\%$ of 10000
 $= 56\%$ of 10000
 $= 5600$
 Required average = $\frac{5600}{3} = 1866.67 = 1867$ (approx.)
12. (c): Vacancies announced by RBI
 $= 16\%$ of 10000 = 1600
 Vacancies announced by SBI
 $= 20\%$ of 10000 = 2000
 Required % = $\frac{400}{2000} \times 100 = 20\%$
13. (d): Central angle of SBI = $\frac{20}{100} \times 360 = 72^\circ$
 Central angle of EPFO = $\frac{10}{100} \times 360 = 36^\circ$
 Required central angle = $72^\circ + 36^\circ = 108^\circ$
14. (a): Vacancies announced by SBI = 20% of 10000 = 2000
 Reduced vacancies of SBI = 10% of 2000 = 200
 Vacancies announced by LIC = 14% of 10000 = 1400
 Total vacancies announced by LIC = $1400 \times \frac{1}{7} + 1400 = 1600$
15. (b): Vacancies announced by EPFO, SSC and IBPS together
 $= (10 + 15 + 25)\%$ of 10000
 $= 50\%$ of 10000
 $= 5000$
16. (a): Indigo bookings using PayTm = $\frac{20}{100} \times 400 = 80$
 Non-Indigo bookings using EMT = $\frac{20}{100} \times 1000 - \frac{15}{100} \times 400 = 140$
 Required ratio = $\frac{80}{140} = 4:7$

- 17. (e):** Indigo tickets booked using MMT & Yatra = $\frac{30+25}{100} \times 400 = 220$
 Total tickets booked using Golbibo & PayTm = $\frac{(15+20)}{100} \times 1000 = 350$
 Required percent = $\frac{220}{350} \times 100 = 62.86\% \approx 63\%$
- 18. (c):** Total bookings through MMT = $\frac{25}{100} \times 1000 = 250$
 Indigo bookings using MMT = $\frac{30}{100} \times 400 = 120$
 Air India bookings using MMT = $\frac{30}{100} \times 120 = 36$
 Spicejet tickets booked using MMT = $250 - (120 + 36) = 94$
 Required percent = $\frac{94}{250} \times 100 = 37\frac{3}{5}\%$
- 19. (b):** bookings made in previous month = $\frac{15}{100} \times 1000 \times \frac{100}{120} = 125$
 Non Indigo bookings in previous month = $125 - \frac{20}{100} \times 125 = 100$
 Non Indigo bookings in present month = $\frac{15}{100} \times 1000 - \frac{10}{100} \times 400 = 110$
 Required % = $\frac{110-100}{100} \times 100 = 10\%$
- 20. (d):** No. of tickets sold of indigo = $\frac{20}{100} \times 400 = 80$
 No. of tickets sold of spicejet = $\frac{80}{8} \times 7 = 70$
 No. of tickets sold of airasia = $\frac{20}{100} \times 1000 - (80 + 70) = 50$
 Total earning from airasia = $200 \times 5000 - (80 \times 4000 + 70 \times 5000) = 1000000 - 670000 = \text{Rs. } 330000$
 Airasia ticket price = $\frac{330000}{50} = \text{Rs. } 6600$
- 21. (b):** Number of consumers of Coffee in A = $\left(15000 \times \frac{30}{100} - 6000 \times \frac{15}{100}\right) \times \frac{100}{225}$
 $= (4500 - 900) \times \frac{100}{225}$
 $= 1600$
 Number of consumers of Tea in D & E together = $6000 \times \frac{(30+10)}{100}$
 $= 2400$
 Required % = $\frac{2400-1600}{2400} \times 100$
 $= 33\frac{1}{3}\%$
- 21. (e):** Central angle of total consumers of Tea in A & C together = $\frac{15+25}{100} \times 360^\circ$
 $= 144^\circ$

- 23. (d):** Consumers of Coffee in C = $6000 \times \frac{10}{100} \times \frac{125}{100}$
 $= 750$
 Consumers of Coffee in D = $15000 \times \frac{12}{100} - 6000 \times \frac{30}{100}$
 $= 1800 - 1800 = 0$
 Consumers of Tea in A = $6000 \times \frac{15}{100}$
 $= 900$
 Required difference = $900 - (750 + 0)$
 $= 150$
- 24. (c):** Consumers of Coffee and Cold drinks in B & C together = $\left(15000 \times \frac{20+16}{100}\right) - \left(6000 \times \frac{20+25}{100}\right)$
 $= 5400 - 2700$
 $= 2700$
 Average number of consumers of Tea in B, C & D = $\frac{1}{3} \times \left(6000 \times \frac{(20+25+30)}{100}\right)$
 $= 1500$
 Required percentage = $\frac{2700}{1500} \times 100$
 $= 180\%$
- 25. (a):** Consumers of Coffee in B & E together = $\left(\left(15000 \times \frac{20}{100} - 6000 \times \frac{20}{100}\right) \times \frac{7}{12}\right) + \left(\left(15000 \times \frac{22}{100} - 6000 \times \frac{10}{100}\right) \times \frac{11}{18}\right)$
 $= 1050 + 1650$
 $= 2700$
 Consumers of Cold drinks in B & E together = $\left(\left(15000 \times \frac{20}{100} - 6000 \times \frac{20}{100}\right) \times \frac{5}{12}\right) + \left(\left(15000 \times \frac{22}{100} - 6000 \times \frac{10}{100}\right) \times \frac{7}{18}\right)$
 $= 750 + 1050 = 1800$
 Required % = $\frac{2700-1800}{1800} \times 100 = 50\%$
- 26. (d):** Let total number of passengers travelling to Thailand be x and total number of passengers travelling to Arab Emirates be 2x
 ATQ-
 $\frac{2x \times (28+14)}{100} - x \times \frac{(20+19)}{100} = 1350$
 $\frac{21x}{25} - \frac{39x}{100} = 1350$
 $45x = 135000$
 $x = 3000$
 Total number of passengers travelling by Air Asia to both countries = $3000 \times \frac{16}{100} + (2 \times 3000) \times \frac{18}{100}$
 $= 480 + 1080$
 $= 1560$

- 27. (b):** Let total number of passengers travelling to Thailand is x and total number of passengers travelling to Arab Emirates is $2x$

ATQ -

$$\frac{2x \times 28}{100} \times \frac{2}{7} - \frac{x \times 20}{100} \times \frac{2}{5} = 240$$

$$\frac{16x}{100} - \frac{8x}{100} = 240$$

$$8x = 24000$$

$$x = 3000$$

Total passengers travelling to both countries in 2017

$$= 3000 + 2 \times 3000$$

$$= 9000$$

- 28. (e):** Lets total number of passengers travelling to Thailand is x and total passengers travelling to Arab Emirates is $2x$

Total number of passengers travelling to Arab Emirates from U.P by spice jet

$$= \frac{2x \times 15}{100} \times \frac{60}{100} \times \frac{5}{9}$$

$$= \frac{x}{10}$$

ATQ-

$$\frac{x \times 12}{100} - \frac{x}{10} = 60$$

$$x = 3000$$

Total number of passengers travelling to Thailand by Air India & Go Air

$$= 3000 \times \frac{(23+10)}{100} = 990$$

- 29. (a):** Lets total number of passengers travelling to Thailand is x and total number of passengers travelling to Arab Emirates is $2x$

$$\frac{x \times 12}{100} = 360$$

$$x = 3000$$

Total number of passengers travelling to Thailand by IndiGo, Air India & Spicejet together

$$= 3000 \times \left(\frac{20+23+19}{100} \right)$$

$$= 1860$$

Total number of passengers travelling to Arab Emirates by Air India & Jet Airways together

$$= (2 \times 3000) \times \left(\frac{28+14}{100} \right)$$

$$= 2520$$

$$\text{Required Percentage} = \frac{2520-1860}{1860} \times 100$$

$$= \frac{660}{1860} \times 100$$

$$= 35 \frac{15}{31} \%$$

Alternative-

Required percentage

$$= \frac{2x \times \frac{(28+14)}{100} - x \times \left(\frac{20+19+23}{100} \right)}{\frac{x \times (20+19+23)}{100}} \times 100$$

$$= \frac{84x-62x}{62x} \times 100 = 35 \frac{15}{31} \%$$

- 30. (c):** Lets total number of passengers travelling to Thailand is x and total number of passengers travelling to Arab Emirates is $2x$

ATQ

$$\frac{2x \times 28}{100} + \frac{x \times 23}{100} = 2370$$

$$\frac{56x}{100} + \frac{23x}{100} = 2370$$

$$x = \frac{2370 \times 100}{79}$$

$$x = 3000$$

$$\text{Required ratio} = \frac{3000 \times \frac{(23+20)}{100}}{(2 \times 3000) \times \frac{(13+15)}{100}} = 43 : 56$$

Alternative-

$$\text{Required ratio} = \frac{x \times \frac{(23+20)}{100}}{2x \times \frac{(13+15)}{100}} = 43 : 56$$

- 31. (c):** Total employees travelling on Friday by metro =

$$\frac{50}{300} \times 6000 = 1000$$

$$\text{Total employees travelling on Sunday by cab} = \frac{20}{100}$$

$$\times 4800 - y = 960 - y$$

ATQ,

$$960 - y + 2 \times 1000 = \frac{75}{100} \left[\frac{15}{100} \times 6000 + \frac{25}{100} \times 4800 \right]$$

$$2960 - y = .75 \times 2100$$

$$Y = 2960 - 1575 = 1385$$

- 32. (b):** No. of employees travelling by metro on Wednesday & Thursday together.

$$= \frac{15}{100} \times 6000 + \frac{10}{100} \times 6000$$

$$= 900 + 600 = 1500$$

No. of employees travelling by Cab on same days together.

$$= \frac{25}{100} \times 4800 + \frac{20}{300} \times 4800$$

$$= 1200 + 320 = 1520$$

$$\text{Required difference} = 1520 - 1500 = 20$$

- 33. (d):** Fare per person travelling by metro

$$= \frac{5}{12} \times 120 = \text{Rs. } 50$$

Fare per person travelling by cab .

$$= \frac{7}{12} \times 120 = \text{Rs } 70$$

$$\text{Require ratio} = \frac{\frac{20}{300} \times 4800 \times 70}{\frac{10}{100} \times 6000 \times 50} = 56 : 75$$

- 34. (a):** Total employees travelling by metro on Monday

$$= \frac{20}{100} \times 6000 = 1200$$

$$\therefore \text{Per person fare} = \frac{48000}{1200} = \text{Rs. } 40$$

\therefore Total fare on Monday of all employees travelling by cab

$$= \frac{25}{100} \times 4800 \times 40 = \text{Rs. } 48000$$

35. (e): Total No. of employees travelling by metro on Friday & Saturday together

$$= \frac{50}{300} \times 6000 + \frac{15}{100} \times 6000$$

$$= 1000 + 900 = 1900$$
 Total no. of employees travelling by cab on same days together

$$= \frac{20}{100} \times 4800 + \frac{10}{100} \times 4800$$

$$= 960 + 480 = 1440$$
 Required Percentage = $\frac{1900-1440}{1440} \times 100$
 approximately 32%

36. (b): Female population of village B = $\frac{3}{7} \times \frac{35}{100} \times 2500 = 375$
 Required % = $\frac{375}{1750} \times 100 = 21\frac{3}{7}\%$

37. (d): Male population of Village A = $\frac{20}{100} \times 2500 = 500$
 Female population of Village D = $\frac{12}{100} \times 2500 \times \frac{5}{4} = 375$
 Female population of Village E = $\frac{18}{100} \times 2500 \times \frac{7}{6} = 525$
 Required % = $\frac{(525+375)-(500)}{(525+375)} \times 100 = \frac{400}{900} \times 100 = 44\frac{4}{9}\%$

38. (c): Required difference = $\left[\frac{(35+15)}{2} - \frac{(12+18)}{2} \right] \times 25 \times \frac{7}{10} = (25 - 15) \times 17.5 = 10 \times 17.5 = 175$

39. (e): Female population of village D = $\frac{450}{5} \times 4 = 90 \times 4 = 360$
 Female population of village C = $\frac{360}{3} \times 2 = 240$
 Required population = $360 + 240 = 600$

40. (d): Male population of village G = $107\frac{7}{9}\% \text{ of } \frac{18}{100} \times 2500 = 485$
 Female population of village G = $102\frac{6}{7}\% \text{ of } \frac{35}{100} \times 2500 = 900$
 Total population of Village G = $485 + 900 = 1385$

41. (b): Let total no. of males = x
 total no. of females = y
 ATQ,

$$\frac{12 \times y}{100} \times \frac{100}{15 \times x} = \frac{32}{45}$$

$$\frac{y}{x} = \frac{8}{9}$$
 Number of males and females 8a, 9a
 No. of males in E $\rightarrow \frac{23 \times 9a}{100} = 2.07a$
 No. of females in C = $\frac{16 \times 8a}{100} = 1.28a$

$$\text{Required \%} = \frac{0.79a}{1.28a} \times 100 \approx 62\%$$

42. (e): Total males and females = $21000 \times 2 = 42000$
 Now let total no. of males is 'x' and total no. of females is 'y'
 ATQ,

$$\frac{16 \times x}{100} - \frac{16 \times y}{100} = 320$$

$$x - y = 2000 \quad \dots(i)$$

$$x + y = 42000 \quad \dots(ii)$$
 Solving (i) and (ii)
 $x = 22000$
 $y = 20000$

$$\text{Female in company A} = \frac{18 \times 20000}{100} = 3600$$

43. (a): Total no. of males = $\frac{3900 \times 100}{26} = 15000$
 Total no. of females = $\frac{15000 \times 2}{3} = 10,000$
 Required average = $\frac{3900 + 2400 + 1200}{3} = 2500$

44. (e): Let number of females in company A = 4y
 So, number of males in company B = 5y
 Total number of males = $\frac{5y}{20} \times 100 = 25y$
 Total number of females = $\frac{4y}{18} \times 100 = \frac{200}{9}y$
 ATQ,

$$\frac{200y}{9 \times 25y} = \frac{x^3}{(x+1)^2}$$

$$\frac{8}{9} = \frac{x^3}{(x+1)^2}$$
 Value of x = 2

45. (d): Let total no. males = x
 total no. of females = y
 So, average no. of male in company A, B and C

$$= \frac{(20+16+15)x}{100 \times 3} = \frac{17x}{100}$$
 Average no. of females of company A, B and E

$$= \frac{(18+12+30)y}{100 \times 3} = \frac{20y}{100}$$
 Ratio \rightarrow

$$\frac{17x}{100} : \frac{20y}{100} = 51 : 65$$

$$\frac{x}{y} = \frac{12}{13}$$
 Required percentage = $\frac{1}{12} \times 100 = 8.33\%$

46. (b) Let total NRO accounts opened in the whole year = x
 $\therefore 16\frac{7}{8}\% \text{ of } x = \frac{27}{100} \times 500$
 $x = 800$
 Required accounts opened = $(800 - 500) = 300$

47. (e) NRE accounts opened in 4th quarter

$$= 142\frac{6}{7}\% \text{ of } \left(\frac{42}{100} \times 750 \right) = 450$$

$$\begin{aligned}\text{Required average} &= \frac{450+750}{4} \\ &= \frac{1200}{4} = 300\end{aligned}$$

48. (d): Let NRE accounts = $3x$

NRO accounts = $2x$

$$(3x - 750) = (2x - 500)1.5x$$

We can't determine the value of x .

49. (a): IV quarter (NRE accounts) = $240 + \frac{28}{100} \times 750$
 $= 210 + 240 = 450$
 Required % = $\frac{450}{1200} \times 100 = 37.5\%$

50. (d): Since we don't know total no. of accounts. Hence, we can't give the required answer

51. (d): Production of Cricket bats in 1st quarter = $2000 \times \frac{28}{100}$
 According to the question,
 $560 = 25\%$ of total production of bats
 Total production = $\frac{560}{25} \times 100 = 2240$
 Production of 4th quarter = $2240 - 2000 = 240$

52. (b): Cricket- balls produced in 4th quarter
 $= \left(5000 \times \frac{30}{100}\right) \times \left(1 - \frac{1}{3}\right) = 1000$
 Total production including 4th quarter = $5000 + 1000 = 6000$
 Required answer = $\frac{1000}{6000} \times 100 = 16.67\%$

53. (b): Total production of Cricket- bats in 2nd and 3rd quarter
 $= \frac{2000 \times (40+32)}{100} = 1440$
 Total production of Cricket- balls in 2nd and 3rd quarter
 $= \frac{5000 \times (30+45)}{100} = 3750$
 Required answer = $\frac{1440}{3750} \times 100 = 38.4\%$

54. (a): Total production of Cricket- bats in 1st and 2nd quarter
 $= \frac{2000 \times (28+32)}{100} = 1200$
 Average production = $\frac{1200}{2} = 600$
 Production of Cricket- balls in 3rd quarter = $\frac{5000 \times 45}{100} = 2250$
 Required answer = $\frac{(2250 - 600)}{2250} \times 100 = 73.33\%$ less

55. (b): Production of Cricket- bats in 2nd quarter = $\frac{2000 \times 32}{100} = 640$
 Production of Cricket- balls in 4th quarter
 $= \frac{640 \times (100 + 35)}{100} = 864$

Production of 4th quarter Cricket- bats = $\frac{864 \times (100 - 25)}{100} = 648$

Total production of Cricket- bats all the quarter together = $2000 + 648 = 2648$

Required answer = $\frac{(2000 \times \frac{32}{100}) \times 100}{2648} = 24.17\%$

56. (c): Let total person travelling through Delhi metro in all six days = $10x$
 So total person travelled through Mumbai metro in all six days = $9x$

According to condition

$$\frac{10x}{100} \times \frac{50}{3} - \frac{9x}{100} \times \frac{40}{3} = 70$$

$$500x - 360x = 70 \times 300$$

$$140x = 70 \times 300$$

$$x = 150$$

Total person travelled through Delhi metro in all six days = 1500

Total person travelled through Mumbai metro in all six days = 1350

Total fare of Delhi metro on Saturday

$$= \frac{35}{300} \times 1500 \times 18 = \text{Rs. } 3150$$

Total fare of Mumbai metro on Saturday

$$= \frac{5}{27} \times 1350 \times 20 = \text{Rs. } 5000$$

Required difference = 1850

57. (e): $\frac{\frac{35}{300} \times 1500 - x}{\frac{5}{27} \times 1350 - x} = \frac{2}{3}$
 $\frac{175 - x}{250 - x} = \frac{2}{3}$
 $525 - 3x = 500 - 2x$
 $x = 25$

58. (a): Total people travelling in Delhi metro on Wednesday and Thursday

$$= \frac{10x}{100} \times \left(\frac{50}{3} + \frac{50}{3}\right) = \frac{10x}{3}$$

Total people travelling in Mumbai metro on Monday and Saturday together

$$= \frac{9x}{100} \times \left(\frac{200}{9} + \frac{500}{27}\right) = \frac{11x}{3}$$

$$\text{Required percentage} = \frac{\frac{10x}{3}}{\frac{11x}{3}} \times 100$$

$$= \frac{1000}{11} \% = 90 \frac{10}{11} \%$$

59. (c): $20 \times 15 \times 10x + \frac{100}{9} \times 13.5 \times 9x = 4350$

$$3000x + 1350x = 4350$$

$$4350x = 4350$$

$$x = 1$$

∴ Required percentage

$$= \frac{15 \times \frac{70}{3} \times 10 - 13.5 \times \frac{500}{27} \times 9}{13.5 \times \frac{500}{27} \times 9} \times 100$$

$$= \frac{3500 - 2250}{2250} \times 100 = \frac{1250}{2250} \times 100$$

$$= \frac{500}{9} \% = 55\frac{5}{9} \%$$

Alternate Method

Person travelled on Delhi metro on Monday

$$= 1500 \times \frac{70}{300} = 350$$

Person travelled on Mumbai metro on Saturday

$$= 1350 \times \frac{500}{2700} = 250$$

Let fare per person of Delhi metro and Mumbai metro is $10x$ and $9x$ respectively

Required percentage

$$= \frac{350 \times 10x + 250 \times 9x}{250 \times 9x} \times 100 = \frac{1250x}{2250x} \times 100 = 55\frac{5}{9} \%$$

60. (d): Total person travelling both metro on Sunday

$$= \frac{120}{100} \times 15 \times \frac{35}{3} + \frac{130}{100} \times 13.5 \times \frac{500}{27}$$

$$= 210 + 325 = 535$$

Total people travelled by both metro on Monday

$$= 15 \times \frac{70}{3} + 13.5 \times \frac{200}{9}$$

$$= 350 + 300 = 650$$

$$\text{Required percentage} = \frac{535}{650} \times 100 = 82\frac{4}{13} \%$$

61. (c): Required ratio = $\frac{\frac{30}{100} \times 1090}{\frac{25}{100} \times 408} = \frac{30 \times 1090}{25 \times 408} = \frac{109}{34}$

62. (b): Number of Environmental Engineers recruited

$$\text{from IITs} = \frac{4}{5} \times \frac{72^\circ}{360^\circ} \times 6800 = 1088$$

Number of non-IITians Environmental Engineers

$$\text{recruited} = \frac{15}{100} \times 12600 - 1088$$

$$= 1890 - 1088 = 802$$

63. (a): Number of Transport Engineers from IITs

$$= \frac{64.8^\circ}{360^\circ} \times 6800$$

Total number Transport Engineers

$$= \frac{17}{100} \times 12600$$

$$= 2142$$

Non-IITian Transport Engineers = $2142 - 1224$

$$= 918$$

$$\text{Required percent} = \frac{1224 - 918}{918} \times 100$$

$$= \frac{306}{918} \times 100 = 33\frac{1}{3} \%$$

64. (d): Total number recruited structural Engineers

$$= \frac{21}{100} \times 12600 = 2646$$

Number of Engineers should be recruited from IITs

$$= \frac{1}{2} \times 2646 = 1323$$

Initially number of structural Engineers recruited

$$\text{from IITs} = \frac{79.2}{360} \times 6800 = 1496$$

$$\text{Required percent} = \frac{1496 - 1323}{1496} \times 100 = 11.56 \%$$

65. (b): Average = $\frac{918 + 1090}{2} = \frac{2008}{2} = 1004$

66. (b): If Varun did not pay for 'others' he can fully pay for fuel (8%), phone & electricity bill (10%) and rent (20%) or clothing (25%).

67. (a): To get the least number of heads of expenses paid by more than one person, Varun (45%) must pay for clothing (25%) and rent (20%), Tarun (30%) must pay for food (30%), Arun (10%) must pay for the phone and electricity bill (10%) and Karan (9%) must pay for fuel.

Only 'others' (7%) is paid by Charan (6%) and Karan (9%)

68. (b): If Varun does not spent any amount on food, his expenditure will be only on the remaining items. As remaining items constitute 70% out of which 45 percent points are contributed by Varun. If Varun fully contributes to fuel, phone and electricity bill and others, then his contribution on rent and clothing will become the least.

$$\therefore \text{The required percentage} = \frac{45 - (10 + 8 + 7)}{45} \times 100$$

$$= 44.44 \%$$

69. (c): The bill for food is 30%, and at most 40% of each person's income can be paid for food. If we use 40% of each person's income, we get 40% of the total. As we need only 30%, i.e., 75% of 40%, 25% of the total income need not be used. As the sum of the incomes of Arun, Karan and Charan is 25%, if we use 40% of incomes of only Varun and Tarun, all expenses of food can be accounted for.

70. (c): Assuming exactly 5% of the total expenses under each head is paid from karan's income, it will account for 5% of the total income. As Karan's income is 9% of the total income, the remaining = 4% of total income. For the percentage share of karan's payment under any head to be maximum, he should contribute all his remaining income for the head under which the expenditure is the least, i.e. 'others'. As he has already paid for 5% of the expenses under that head, together with the remaining 4%, his share for payment under the head 'others' would be $5\% + \frac{4}{7} \times 100 = 62.14\%$.

71. (a): Let Total sale in 2015 = $4x$

Let total sale in 2016 = $5x$

$$\text{Sale of pulsar in 2015} = \frac{4x}{100} \times \frac{200}{7} = \frac{8x}{7}$$

$$\text{Sale of pulsar in 2016} = \frac{5x}{360} \times 111 = \frac{37x}{24}$$

$$\text{Required percentage} = \frac{\frac{24}{37x} - \frac{8x}{7}}{\frac{8x}{7}} \times 100$$

$$= \frac{67}{24 \times 8} \times 100 \Rightarrow \frac{67}{192} \times 100 \approx 35\% \text{ increase}$$

72. (c): Total sale of bike in 2016 = $\frac{120}{100} \times 84000 = 100800$
 Sale of splendor in 2015 = $\frac{84000}{100} \times \frac{100}{7} = 12000$
 Sale of splendor in 2016 = $\frac{100800}{360} \times 67 = 18760$
 Required difference = $18760 - 12000 = 6760$

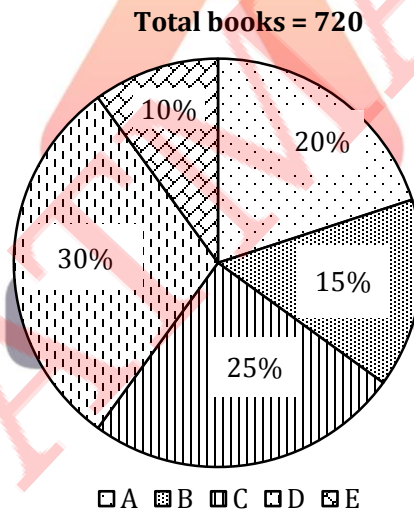
73. (d): Let sale of Pulsar in 2015 = $3x$
 Let sale of Bullet in 2016 = $7x$
 Sale of Suzuki in 2015 = $\frac{3x \times 7}{200} \times \frac{100}{6} = \frac{7x}{4}$
 Sale of discover in 2016 = $\frac{7x}{82} \times 56$
 Required % = $\frac{\frac{7x \times 56}{82}}{\frac{7x}{4}} \times 100$
 $= \frac{112}{41} \times 100 \approx 273\%$

74. (a): Let total sale in 2015 = $2x$
 Let total sale in 2016 = $3x$
 Sale of Suzuki in 2015 = $\frac{2x}{100} \times \frac{100}{6} = \frac{x}{3}$
 Sale of Suzuki in 2016 = $\frac{3x}{360} \times 44 = \frac{11x}{30}$
 Required ratio = $\frac{\frac{x}{3} \times 45000}{\frac{11x}{30} \times 54000} = \frac{25}{33}$

75. (e): Let total sale for both years = x
 Sale of Bullet in 2015 = $\frac{x}{100} \times \frac{100}{3} = \frac{x}{3}$
 Sale of Bullet in 2016 = $\frac{x}{360} \times 82$
 Required % = $\frac{\frac{x}{3} - \frac{41x}{180}}{\frac{41x}{180}} \times 100 = \frac{19x}{41x} \times 100 \approx 46\%$

Previous Years' Questions of Prelims

Directions (1-6): Read the given pie-chart carefully and answer the following questions.
 The given pie-chart shows the percentage distribution of books sold by in five different book sellers.

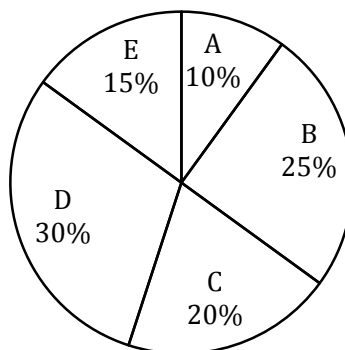


- Find the difference between central angle of books sold by C and that of by D?
 (a) 20° (b) 18° (c) 15° (d) 24° (e) 30°
- Find the difference between total books sold by B & E together and total books sold by A?
 (a) 30 (b) 24 (c) 40 (d) 36 (e) 48
- Find ratio of total books sold by B & C together to total books sold by A & E together?
 (a) 4 : 3 (b) 3 : 4 (c) 4 : 5 (d) 5 : 4 (e) 3 : 2
- Total number of books sold by B & D together is what percent more than total number of books sold by A & E together?
 (a) 40% (b) 70% (c) 80% (d) 60% (e) 50%
- Find the average number of books sold by A, C & E?
 (a) 150 (b) 160 (c) 200 (d) 180 (e) 240
- If A & B sold each book at Rs. 15 and Rs. 18 respectively, then find total revenue get by A & B together?
 (a) Rs. 4124 (b) Rs. 4104 (c) Rs. 4114 (d) Rs. 4140 (e) Rs. 4144

Directions (7-11): Study the pie chart given below and answer the following questions.

Pie chart shows the percentage distribution of total units of soap sold by 5 different companies (A, B, C, D & E).

Total units of soap sold = 2800

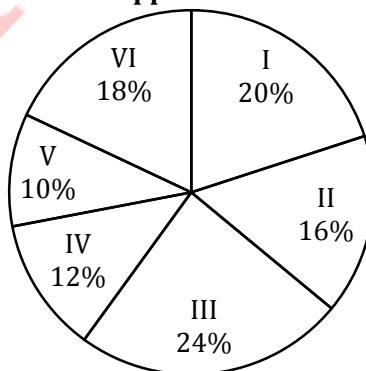


□ A □ B □ C □ D □ E

7. Units of soap sold by B are how much more or less than units of soap sold by A?
 (a) 450 units (b) 420 units (c) 440 units (d) 480 units (e) 510 units
8. Find ratio of average number of units of soap sold by A, C & E to average number of units of soap sold by B & D.
 (a) 6 : 11 (b) 5 : 7 (c) 1 : 4 (d) 1 : 2 (e) 3 : 4
9. Find the central angle (in degrees) of units of soap sold by B & D together.
 (a) 152 (b) 144 (c) 168 (d) 176 (e) 198
10. If units of soap sold by F are 45% more than units of soap sold by A & E together, then find units of soap sold by F are what percent of units of soap sold by C & D together?
 (a) 72.5% (b) 79.5% (c) 84.5% (d) 88.5% (e) 80.5%
11. If ratio of sold to unsold units of soap of B & E is 7 : 5 and 3 : 1 respectively, then find total (sold + unsold) units of soap manufactured by B & E together.
 (a) 1820 units (b) 1780 units (c) 1740 units (d) 1800 units (e) 1760 units

Directions (12-17): Pie chart shows the percentage distribution of total students appeared in six different shifts of an exam. Study the pie chart given below and answer the following questions.

Total students appeared in exam - 5500

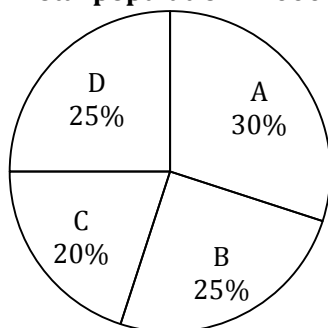


12. Find average number of students appeared in shift I, II & IV of the exam.
 (a) 1040 (b) 900 (c) 720 (d) 1140 (e) 880
13. Find the central angle for students appeared in shift II of the examination.
 (a) 64.2° (b) 48° (c) 57.6° (d) 43.6° (e) 52.8°
14. Find total number of students appeared in shift V & VI together of the examination.
 (a) 1740 (b) 1600 (c) 1820 (d) 1960 (e) 1540

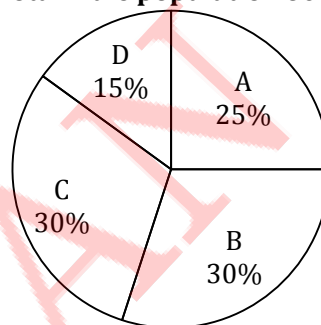
15. Students appeared in shift III & IV together of the examination are what percent more or less than students appeared in shift I of the examination?
 (a) 90% (b) 80% (c) 70% (d) 50% (e) 60%
16. Find ratio of students appeared in shift IV & VI together of the examination to students appeared in shift II & III together of the examination.
 (a) 3:4 (b) 5:7 (c) 4:3 (d) 7:5 (e) None of the above.
17. Students appeared in shift I & VI together of the examination are how much more or less than students appeared in shift III & V together of the examination?
 (a) 330 (b) 150 (c) 360 (d) 280 (e) 220

Directions (18-22): Given pie chart shows the population (MALE + FEMALE) distribution of 4 states and male population distribution in these 4 states.

Total population 14000

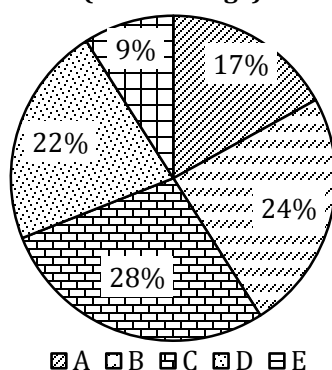


Total male population 6000



18. Female population of state D is what % of the male population of state B.
 (a) $134\frac{4}{9}\%$ (b) $143\frac{4}{9}\%$ (c) $144\frac{4}{9}\%$ (d) $124\frac{4}{9}\%$ (e) $145\frac{4}{9}\%$
19. What is the ratio of the female population of state A to female population of state C.
 (a) 27:10 (b) 27:11 (c) 37:10 (d) 10:27 (e) 11:27
20. What is the difference between the female population of state A to male population of state B?
 (a) 700 (b) 600 (c) 900 (d) 800 (e) 200
21. What is the average of the female population of state B and total population of state C.
 (a) 2350 (b) 1950 (c) 1750 (d) 1200 (e) 2250
22. What is the sum of the female population of states A, C and D?
 (a) 6400 (b) 6300 (c) 5600 (d) 6300 (e) 4300

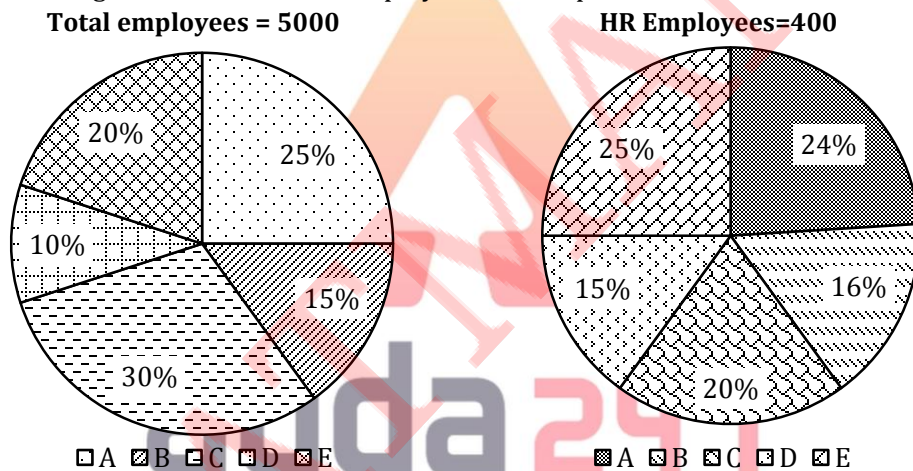
Directions (23-27): Pie chart given below shows percentage distribution of voters (above 60 age) in five state i.e. (A, B, C, D and E) out of total voters (above 60 age).

Total no. of voters = 15200
(above 60 age)

- 23.** What is the difference between maximum and minimum no. of voters in any of the given five state whose age is above 60?
 (a) 2688 (b) 2780 (c) 3208 (d) 2888 (e) 3648
- 24.** If no. of voter who are below 60 in state B are 12.5% more than no. of voters who are above 60 in that state. Find total no. of voters?
 (a) 4104 (b) 7752 (c) 3648 (d) 7344 (e) None of these.
- 25.** What is the difference between no. of voters in state C and in state B and E together whose age is above 60?
 (a) 760 (b) 840 (c) 720 (d) 820 (e) 940
- 26.** What is the average no. of voters whose age is above 60 in state A, D and B together?
 (a) 3012 (b) 3192 (c) 3557 (d) 3437 (e) 2922
- 27.** If $14\frac{2}{7}\%$ voters who are above 60 in state C did not cast their vote then find no. of voters in state D are how much percent more or less than no. of voters who cast their vote in state C whose age is above 60?
 (a) 8.33% more (b) 8.67% less (c) 8.67% more (d) 8.33% less (e) No. of voters are equal.

Direction (28-33): Study the pie-chart given below carefully and answer the questions.

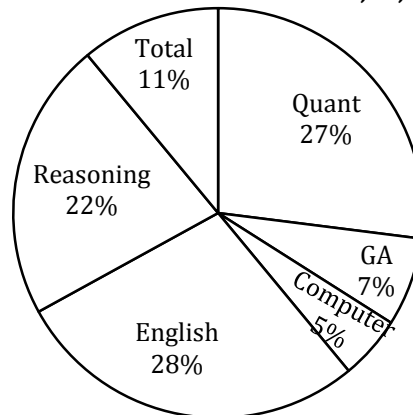
Pie-chart given below shows the percentage distribution of number of employees in all departments in five company and 2nd pie-chart shows percentage distribution of HR employees in all departments.



- 28.** Total HR employees in company A and C together in all departments is approximately what percent of total employees in company C (in all departments) ?
 (a) 16% (b) 22% (c) 12% (d) 8% (e) 28%
- 29.** Ratio of number of females to number of males in company E (all departments together) is 2: 3. Then find difference of no. of males in company E and HR employees in company D and E together?
 (a) 420 (b) 440 (c) 520 (d) 640 (e) None of these
- 30.** Find average of employees who are not HR employees in company A, C and E in all departments together?
 (a) 1142 (b) 1242 (c) 1258 (d) 1158 (e) None of these
- 31.** What is the ratio of number of HR employees in company B and D together in all departments to total number of employees in company A in all departments?
 (a) 61 : 623 (b) 62 : 625 (c) 3 : 11 (d) None of these (e) 1 : 3
- 32.** No. of HR employees in company C and D together in all departments is what percent more or less than No. of employees in company D in all departments?
 (a) 58% (b) 52% (c) 78% (d) 42% (e) 72%
- 33.** No. of employees in company A in all departments is how much more or less than total no. of HR employees in all company in all departments together?
 (a) 720 (b) 940 (c) 880 (d) 850 (e) None of these

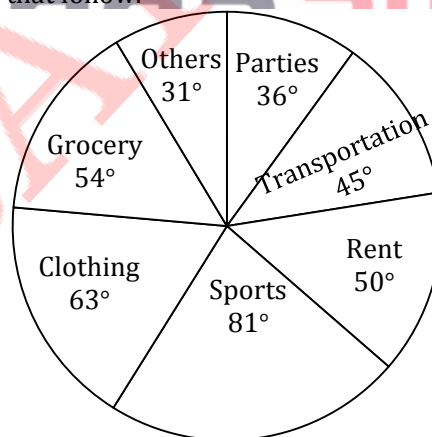
Directions (34-36): The given Pie chart represents the percentage of failed students in different sections of IBPS Mains Exam 2016.

Total No of Failed Candidates = 1,44,000



34. If total candidates failed in IBPS Mains exam is only 24% of the total number of candidates appeared for IBPS PO pre-exam, then total number of candidates appeared in IBPS PO pre-exam are approximately how many times the number of candidates failed in Quant section of Mains Exam?
 (a) 23 (b) 15 (c) 20 (d) 12 (e) 18
35. What is the difference between the number of candidates failed in Reasoning & Total section together and number of candidates failed in Quant Section?
 (a) 8640 (b) 8600 (c) 9000 (d) 8000 (e) 7775
36. Total number of candidates failed in IBPS mains exam is 75% of the number of candidates appeared for same exam. If final selection will be one-third of the candidates who qualified in Mains Exam, then the number of finally selected candidates are:
 (a) 16600 (b) 16000 (c) 17000 (d) 19000 (e) 18000

Directions (37-40): The circle graph shows the spending of a man in various terms during a particular year. Study the graph carefully and answer the questions that follow.



37. What is difference between percentage spending on sports and Grocery?
 (a) 7.5% (b) 9.5% (c) 8.5% (d) 8% (e) 9%
38. Spending's on parties, Sports and Grocery are what percent of spending on others, Rent and Clothing.
 (a) 121.35% (b) 120% (c) 118.75% (d) 112.75% (e) 111.75%
39. If 12% spending of Rent is added in Grocery then find percentage increase in spending of Grocery.
 (a) $9\frac{1}{11}\%$ (b) $11\frac{1}{9}\%$ (c) 12.5% (d) $13\frac{1}{3}\%$ (e) $11\frac{4}{9}\%$
40. If spending on transportation is Rs. 1350, find spending on Sports, Clothing and other together.
 (a) Rs. 6150 (b) Rs. 3750 (c) Rs. 5250 (d) Rs. 6250 (e) Rs. 7150

Previous Years' Solutions of Prelims

1. (b): Required difference = $\frac{30-25}{100} \times 360 = 18^\circ$
2. (d): Required difference = $\frac{(15+10)-20}{100} \times 720 = 36$
3. (a): Required ratio = $\frac{(15+25)}{(20+10)} = 4 : 3$
4. (e): Required percentage = $\frac{(30+15)-(20+10)}{(20+10)} \times 100 = 50\%$
5. (d): Required average = $\frac{20+25+30}{3 \times 100} \times 720 = 180$
6. (b): Total revenue = $720 \times \frac{20}{100} \times 15 + 720 \times \frac{15}{100} \times 18$
 $= 144 \times 15 + 108 \times 18$
 $= 2160 + 1944$
 $= 4104$
7. (b): Units of soap sold by B = $2800 \times \frac{25}{100}$
 $= 700$ units
 Units of soap sold by A = $2800 \times \frac{10}{100}$
 $= 280$ units
 Required difference = $700 - 280$
 $= 420$ units
8. (a): Average number of units of soap sold by A, C & E = $\frac{1}{3} \times \left(\frac{10+20+15}{100}\right) \times 2800 = 420$ units
 Average number of units of soap sold by B & D = $\frac{1}{2} \times \left(\frac{25+30}{100}\right) \times 2800$
 $= 770$ units
 Required ratio = $\frac{420}{770}$
 $= \frac{6}{11} = 6 : 11$
9. (e): Required central angle = $\frac{25+30}{100} \times 360$
 $= 198$ degrees
10. (a): Units of soap sold by F = $\frac{145}{100} \times 2800 \times \frac{10+15}{100}$
 $= 1015$ units
 Units of soap sold by C & D together = $2800 \times \frac{20+30}{100}$
 $= 1400$ units
 Required % = $\frac{1015}{1400} \times 100 = 72.5\%$
11. (e): Sold units of soap of B = $2800 \times \frac{25}{100}$
 $= 700$ units
 Total (sold + unsold) units of soap manufactured by B = $700 \times \frac{12}{7}$
 $= 1200$ units
 Sold units of soap of E = $2800 \times \frac{15}{100}$
 $= 420$ units
 Total (sold + unsold) units of soap manufactured by E = $420 \times \frac{4}{3}$

= 560 units

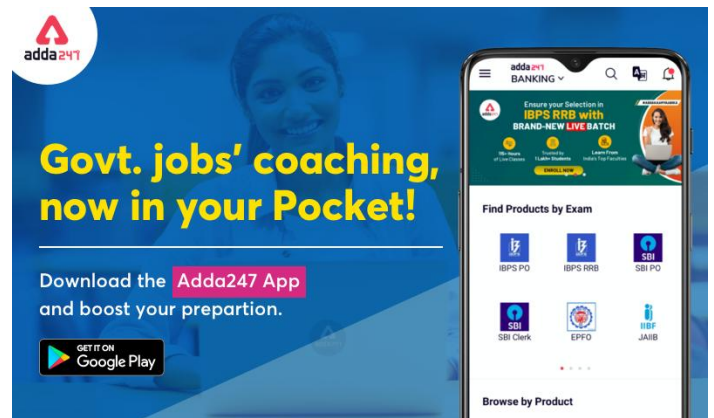
Required units of soap = $1200 + 560$
 $= 1760$ units

12. (e): Required average = $\frac{1}{3} \times \left(5,500 \times \frac{20+16+12}{100}\right) = 880$
13. (c): Required angle = $\frac{16}{100} \times 360^\circ = 57.6^\circ$
14. (e): Required number of students = $5,500 \times \frac{10+18}{100} = 1,540$
15. (b): Students appeared in shift III & IV together of the examination = $5,500 \times \frac{(24+12)}{100} = 1,980$
 Students appeared in shift I of the examination = $5,500 \times \frac{20}{100} = 1,100$
 Required percentage = $\frac{1980-1100}{1100} \times 100 = 80\%$
 Or, required percentage = $\frac{(24+12)-20}{20} \times 100 = 80\%$
16. (a): Students appeared in shift IV & VI together of the examination = $5,500 \times \frac{12+18}{100} = 1,650$
 Students appeared in shift II & III together of the examination = $5,500 \times \frac{16+24}{100} = 2,200$
 Required ratio = $\frac{1650}{2200} = 3:4$
 Or required ratio = $\frac{(12+18)}{(16+24)} = 3 : 4$
17. (e): Students appeared in shift I & VI together of the examination = $5,500 \times \frac{20+18}{100} = 2,090$
 Students appeared in shift III & V together of the examination = $5,500 \times \frac{10+24}{100} = 1,870$
 Required difference = $2090 - 1870 = 220$
18. (c): Total population in state D = $\frac{25}{100} \times 14000 = 3500$
 Male population in state D = $\frac{15}{100} \times 6000 = 900$
 Female population in D = $3500 - 900 = 2600$
 Male population in state B = $\frac{30 \times 6000}{100} = 1800$
 Required % = $\frac{2600 \times 100}{1800} = 144 \frac{4}{9} \%$
19. (a): Female population in state A = $\frac{30 \times 14000}{100} - \frac{25 \times 6000}{100}$
 $\Rightarrow 4200 - 1500$
 $= 2700$
 Female population in state C = $\frac{20 \times 14000}{100} - \frac{30 \times 6000}{100}$
 $\Rightarrow 2800 - 1800$
 $\Rightarrow 1000$
 Ratio = $\frac{2700}{1000} \Rightarrow 27 : 10$

- 20. (c):** Female population in state A = 2700
Male population in state B = $\frac{30 \times 6000}{100} = 1800$
Required difference = $2700 - 1800 = 900$
- 21. (e):** Female population of state B
 $= \frac{25}{100} \times 14000 - \frac{30}{100} \times 6000$
 $= 1700$
Total population of state C = $\frac{20 \times 14000}{100} = 2800$
Average = $\frac{1700 + 2800}{2} \Rightarrow 2250$
- 22. (b):** Requires sum = $2700 + 1000 + 2600 = 6300$
- 23. (d):** required difference = $\frac{28-9}{100} \times 15200$
 $= 19 \times 152 = 2888$
- 24. (b):** no. of voters who are above 60 in state B = $15200 \times \frac{24}{100} = 3648$
No. of voters who are below 60 in state B = $3648 \times \frac{112.5}{100} = 4104$
Total no. of voters in state B = $4104 + 3648 = 7752$
- 25. (a):** required difference = $\frac{24+9-28}{100} \times 15200 = 760$
- 26. (b):** required average = $\frac{17+24+22}{100} \times \frac{1}{3} \times 15200 = 3192$
- 27. (d):** no. of voters in state C who cast their vote = $28\% \times \frac{6}{7} = 24\%$
Required percentage = $\frac{24-22}{24} \times 100 = 8.33\%$ less
- 28. (c):** HR employees in company A and C together
 $= \frac{(24+20)}{100} \times 400 = 176$
Required% = $\frac{176}{\frac{30}{100} \times 5000} \times 100 = 12\%$
- 29. (b):** No. of males in company E
 $= \frac{3}{5} \times \frac{20}{100} \times 5000 = 600$
HR employees in company D & E together
 $= \frac{(15+25)}{100} \times 400 = 160$
Required difference = $600 - 160 = 440$
- 30. (d):** Required average
 $= \frac{1}{3} \left[\frac{(25+30+20)}{100} \times 5000 - \frac{(24+20+25)}{100} \times 400 \right]$
 $= \frac{1}{3} [3750 - 276] = 1158$
- 32. (b):** Required ratio
 $= \frac{\frac{(16+15)}{100} \times 400}{\frac{25}{100} \times 5000} = 62 : 625$
- 32. (e):** No. of employees in company D = $\frac{10}{100} \times 5000 = 500$
No. of HR employees in company C and D together
 $= \frac{(20+15)}{100} \times 400 = 140$

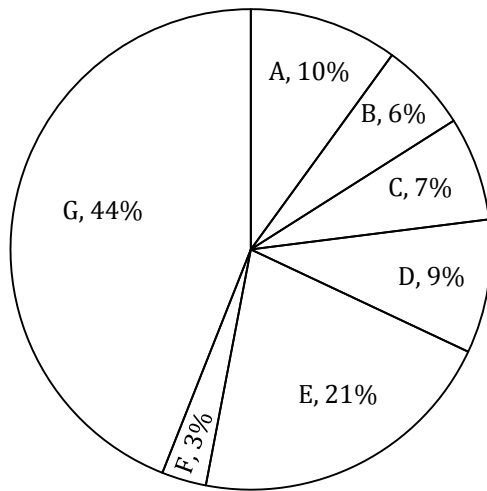
$$\text{Required \%} = \frac{5000-140}{500} \times 100 = 72\%$$

- 33. (d):** Required difference
 $= \frac{25}{100} \times 5000 - 400 = 1250 - 400 = 850$
- 34. (b):** 24% $\rightarrow 1,44,000$
 $\therefore 100\% \rightarrow 600000 = \text{Total no. of candidate appeared in Pre Exam}$
Candidates failed in Quant section in Mains = $1440 \times 27 = 38,880$
 \therefore Desired value will be $\frac{6,00,000}{38,880} \approx \frac{6,00,000}{40,000} = 15$ times
- 35. (a):** No. of candidate failed in (Reasoning & Total section) = $(22 + 11) \times 1440 = 47520$
No. of candidate failed in Quant section = $27 \times 1440 = 38,880$
Difference = $47,520 - 38,880 = 8,640$
- 36. (b):** $144000 = x \times \frac{3}{4}$
 $\therefore x = \text{Total candidates appeared for main exam} = 1,92,000$
Candidates Qualified in Mains Exam
 $= 1,92,000 - 1,44,000 = 48,000$
 \therefore Final Selection = $48,000 \times \frac{1}{3} = 16,000$
- 37. (a):** Required percentage difference = $\left(\frac{81-54}{360} \right) \times 100$
 $= \frac{27}{360} \times 100 = 7.5\%$
- 38. (c):** Spending on Parties, Sports and Grocery in terms of degree = $36^\circ + 81^\circ + 54^\circ = 171^\circ$
Spending on others, Rent and Clothing in degree = $31^\circ + 50^\circ + 63^\circ = 144^\circ$
Required percentage = $\frac{171}{144} \times 100 = 118.75\%$
- 39. (b):** Required percentage increase = $\left(\frac{12 \times 50}{100} \right) \times 100$
 $= \frac{6}{54} \times 100 = 11 \frac{1}{9}\%$
- 40. (c):** Spending on Sport, Clothing and other together
 $= \frac{1350}{45} \times (81 + 63 + 31) = \text{Rs. } 5,250$

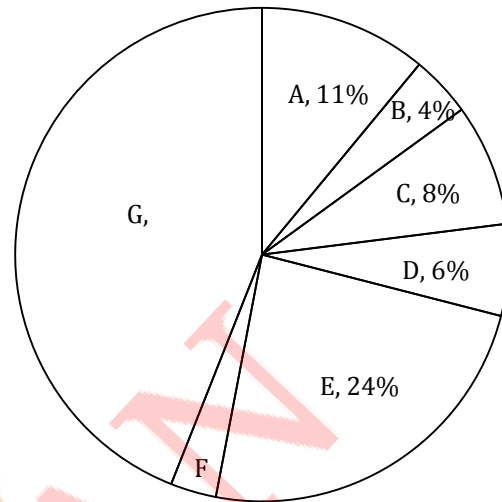


Previous Years' Questions of Mains

Directions (1-5): Percentage distribution of Income of 7 firms in year 2015 and 2016 is given below in pie charts. Percentage distribution of some firms are not given in the chart. You have to calculate these values if required to answer the question.



2015



2016

Ratio of Total Income of all 7 firms in 2015 to total income of all seven firms in 2016 is 5 : 7.

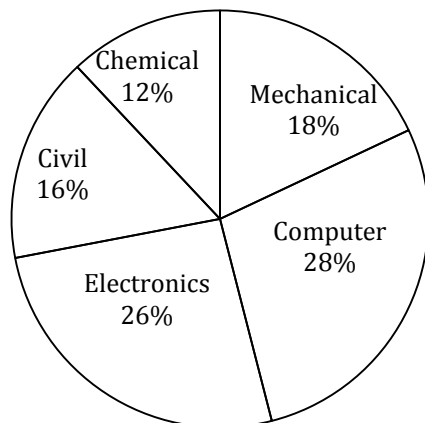
- If profit percent earned by company C in 2015 and profit percent earned by company D in 2016 are equal and income of company D in 2016 is 10 million and expenditure of company D in 2016 is 8 million then what will be profit of C in 2015?
 (a) $\frac{7}{6}$ million (b) $\frac{5}{3}$ million (c) $\frac{8}{7}$ million (d) $\frac{2}{3}$ million (e) 3 million
- If total income of all firm in 2015 is 13860 million then what is the difference between the income of firm E in 2015 and income of A in 2016. (approx.)
 (a) 776 million (b) 820 million (c) 720 million (d) 810 million (e) 800 million
- What will be the ratio of income of firm D in 2015 to the income of firm G in 2016 if income of G and F in 2016 is in the ratio of 24 : 23?
 (a) $\frac{21}{28}$ (b) $\frac{33}{35}$ (c) $\frac{15}{59}$ (d) $\frac{15}{56}$ (e) $\frac{15}{16}$
- If difference between the total income of all firms in 2015 and 2016 is N then what will be the difference between the average of income of firm A, B and C together in 2015 and average of income of firm B, C and D together in 2016
 (a) $\frac{23N}{600}$ (b) $\frac{11N}{600}$ (c) $\frac{23N^3}{600}$ (d) $\frac{11N^2}{600}$ (e) None of these
- If income of company G in 2016 is $\frac{100}{11}\%$ more than income of company G in 2015 then what is the percentage distribution of income for firm F in 2016.
 (a) $\frac{89}{7}\%$ (b) $33\frac{1}{3}\%$ (c) $66\frac{2}{3}\%$ (d) $16\frac{2}{3}\%$ (e) None of these

Directions (6-10): Study the pie charts carefully to answer the questions that follow.

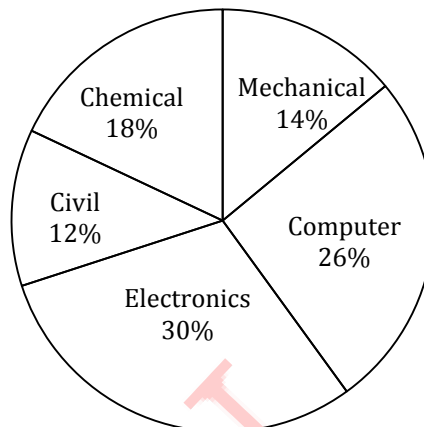
Percentage wise distribution of students and female students in five different streams in an Engineering College.

Total number of students in the college is 5400, out of which number of female students is 2400.

Distribution of students



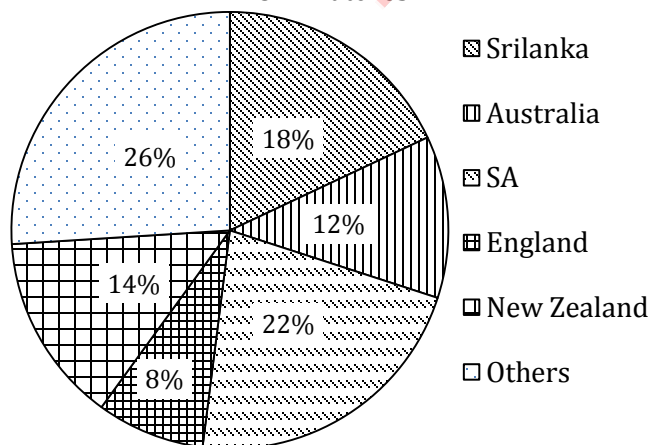
Distribution of female students



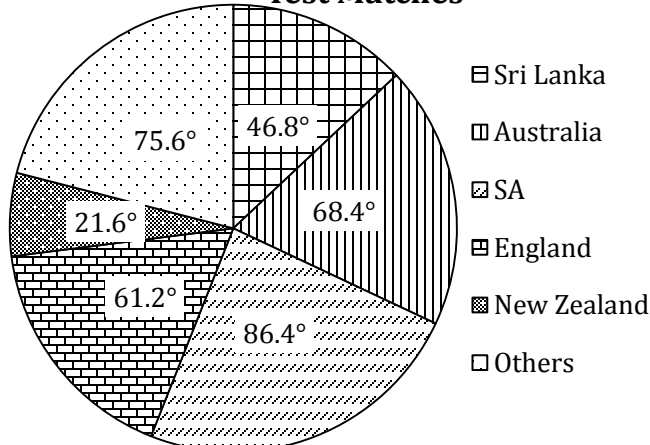
6. The number of female students in Chemical Engineering is what percent of the number of male students in Civil Engineering?
(a) 120% (b) 80% (c) 125% (d) 75% (e) 60%
7. What is the ratio of the number of female students in Mechanical and Computer Engineering together to the number of male students in Electronics and Civil Engineering together?
(a) 21: 16 (b) 16: 21 (c) 5: 7 (d) 7: 5 (e) None of these
8. In a new stream Biotechnology, the total number of students is $8\frac{1}{3}\%$ less than that in Chemical Engineering. If the ratio of the number of male and female students in Biotechnology is 5: 6 then what is the difference between the number of female students in Biotechnology and Chemical Engineering?
(a) 54 (b) 135 (c) 81 (d) 108 (e) 180
9. What is the total number of male students in Computer, Electronics and Chemical Engineering?
(a) 1888 (b) 1776 (c) 1788 (d) 1876 (e) 1728
10. What is the difference between the average of number of male students in Mechanical and Electronics Engineering together and the average of the number of male students in rest of the streams?
(a) 100 (b) 60 (c) 120 (d) 80 (e) 70

Directions (11-15): Given below are the pie charts showing the distribution of runs scored by MS Dhoni against different teams in ODI matches and test matches. The total runs scored by him in ODI matches is 25500 and in test matches is 11200.

ODI Matches

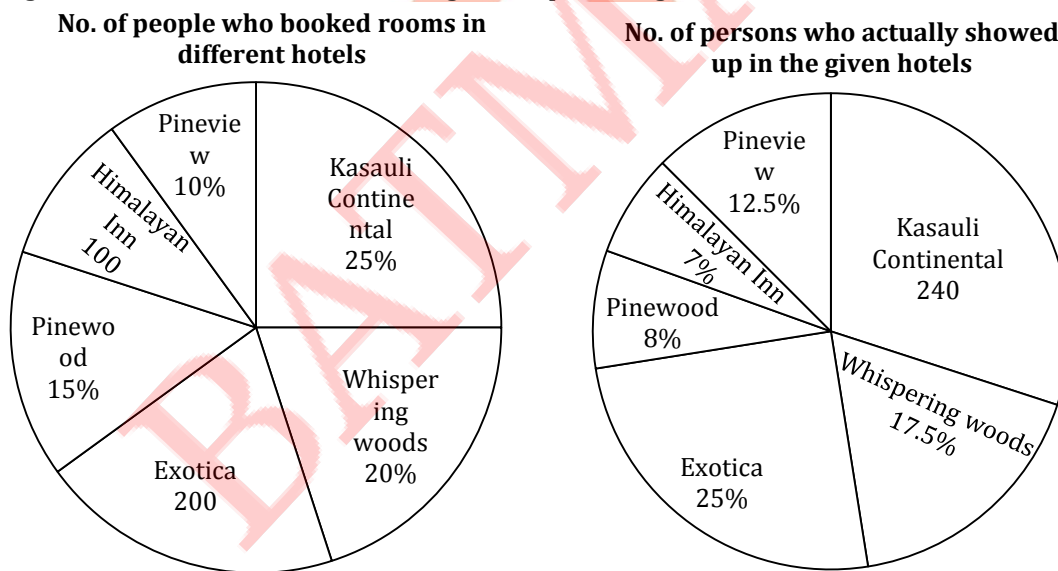


Test Matches



11. If $44\frac{4}{9}\%$ of the runs scored against Sri Lanka in ODI's and $\frac{5}{14}$ of the runs scored against the same team in test matches, are scored in India. Then find the difference between runs scored against Sri Lanka in test matches outside India and the runs scored against the same team in ODI's outside India.
 (a) 1516 (b) 1614 (c) 3419 (d) 1450 (e) 1416
12. Total runs scored by M.S. Dhoni in ODI's against Sri Lanka and SA together are what percent less/more than total runs scored by him in tests against New Zealand and England together?
 (a) 194% (b) 196% (c) 294% (d) 296% (e) 264%
13. Total number of runs scored by him in ODI's against all of the team excluding others are how many times the runs scored by him in tests against SA?
 (a) 8.23 (b) 7.14 (c) 7.02 (d) 6.95 (e) 8.02
14. What is the ratio between of the runs scored by Dhoni in ODI's against England and New Zealand together and runs scored by him in tests against Sri Lanka and Australia together?
 (a) 2805 : 1792 (b) 2905 : 1792 (c) 2805 : 1799 (d) 2875 : 1292 (e) 1792 : 1801
15. If the runs scored in ODI matches against West Indies is 20% of the total runs scored in ODI matches against "others", then find the difference between runs scored against West Indies in ODI matches and the total runs scored against England in test matches and ODI matches together?
 (a) 2541 (b) 2455 (c) 2461 (d) 2375 (e) 2618

Directions (16-20): Study the following pie-graphs and answer the questions based on the information given in it.
 (Note: A person books a single room for himself/herself unless stated otherwise)
 Some values are given as absolute data and some as given as percentage.



16. What is the ratio of the number of persons who didn't show up in Kasauli continental to that of Whispering woods?
 (a) 1 : 6 (b) 2 : 7 (c) 1 : 8 (d) 3 : 5 (e) 5 : 3
17. If the cost of stay per person in Himalayan Inn was Rs. 3000 and there was no provision of refund in case of no show up then calculate the profit made by Himalayan Inn on account of the persons who didn't show up? (All the persons paid for the booking in advance)
 (a) Rs. 152000 (b) Rs. 132000 (c) Rs. 141000 (d) Rs. 140000 (e) Rs. 145000
18. If in Whispering woods, only couples booked the rooms, then find the number of couples who didn't show up there as the percentage of total number of persons who didn't show up in Pinewood? (A couple booked only a room) (Calculate nearby value)
 (a) 40% (b) 24% (c) 35% (d) 28% (e) 50%

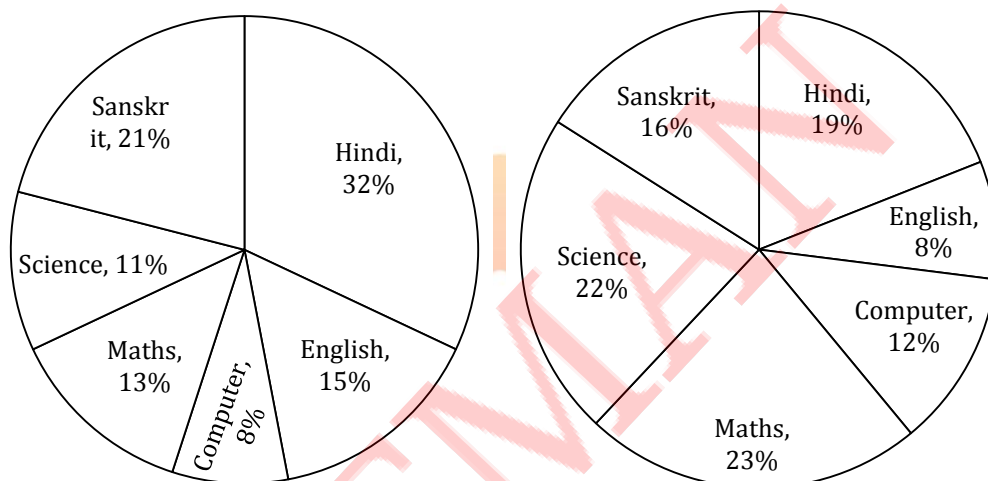
19. Hotel Exotica charges Rs. 5000 per person and Rs. 500 extra for the rooms with balcony. If 30% of the persons who booked Exotica booked rooms without balcony & rest booked the rooms with balcony, then find overall revenue for Exotica?

- (a) Rs. 12,10,000 (b) Rs. 10,80,000 (c) Rs. 9,48,000 (d) Rs. 10,70,000 (e) Rs. 11,55,000

20. Number of person who showed up in Hotel Himalayan Inn & Pinewood together is what percent of the number of person who booked the room in same hotel together?

- (a) 42% (b) 38% (c) 48% (d) 52% (e) 56%

Direction (21-25)-Percentage of students interested in studying different subjects (Hindi, English, Computer, Maths, Science, Sanskrit) in Pie chart I & percentage of girls interested in studying these subjects in pie chart II.



RATIO OF BOYS : GIRL = 5:3

TOTAL STUDENTS = 48,000

21. For which of the subject, the ratio of percentage of student interested in that subject to the percentage of girls interested in that subject is minimum?

- (a) Science (b) Computer (c) Maths (d) English (e) Sanskrit

22. What is the difference between the no. of girls interested in studying computer and that of science?

- (a) 1.5 thousand (b) 2.2 thousand (c) 1.8 thousand (d) 1.9 thousand (e) 2.4 thousand

23. What is the ratio of the no. of boys interested in studying Computer and English together to that of girls interested in studying Sanskrit and Maths together?

- (a) 124 : 117 (b) 128 : 119 (c) 19 : 17 (d) 23 : 19 (e) 5 : 3

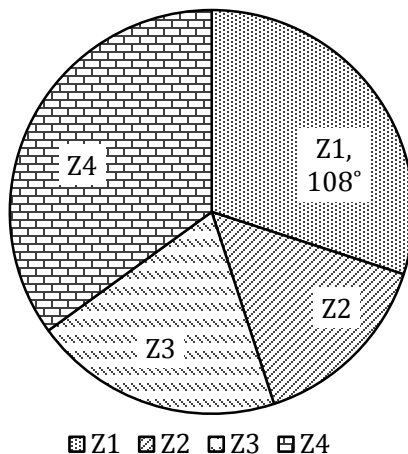
24. What is the ratio of the no. of students interested in studying maths and Sanskrit together to that interested in Hindi and Science together?

- (a) 23 : 32 (b) 34 : 43 (c) 101 : 130 (d) 11 : 32 (e) None of these

25. No. of girls studying Hindi and English together is approximately what percent of the no. of boys studying the same subject?

- (a) 27% (b) 30% (c) 17% (d) 23% (e) 21%

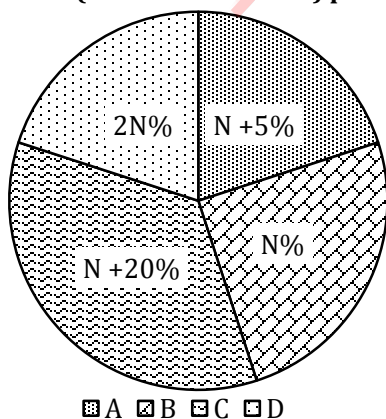
Directions (26 – 30): Given Pie Chart shows the number of total voters registered from 4 different villages.
Total Votes = Valid Votes + Invalid Votes



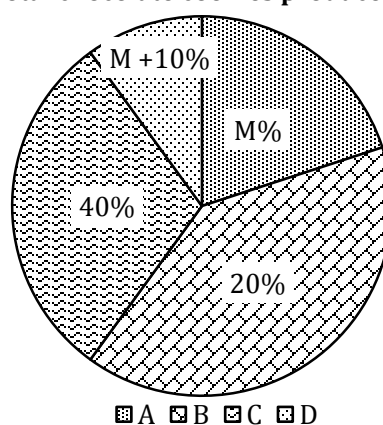
- (i) Total number of valid voters in village Z3 is one-third more than the difference of that of from village Z1 & Z2.
(ii) Difference of valid voters from village Z4 and Z2 is 480. Ratio of total voters from village Z2 and that of Z4 is 3 : 7 respectively.
(iii) total voters in village Z3 are more than that of Z2. Invalid votes from all the villages are 20% of total registered voters.
- 26.** What is the central angle corresponding to total voters in village Z2?
(a) 72° (b) 54° (c) 60° (d) 107° (e) 126°
- 27.** If there are 10800 registered voters in village Z2 of which 98% votes were valid. What can be the difference between valid & invalid votes from village Z4?
(a) 960 (b) None of these (c) 4992 (d) Both (b) & (e) (e) 3072
- 28.** What is the central angle corresponding to valid votes from village Z3?
(a) 75° (b) 82° (c) 108° (d) 60° (e) 95°
- 29.** If there are total 4000 invalid votes from village Z2 & Z1 in ratio 9 : 11 respectively and 20% votes from village Z2 were found invalid. Find number of valid votes from village Z3? (use data of Q3)
(a) 10000 (b) 9000 (c) 11000 (d) 9500 (e) 10500
- 30.** If valid voters from Z4 are more than that of from Z2 and valid voters from Z2 are 3600. Total valid voters from Z1 & Z4 are 10800. How many valid voters are from Z3?
(a) 5300 (b) 3120 (c) 4160 (d) None of these (e) 4080

Direction (31 – 35): Pie chart (i) shows distribution of total cookies (butter + chocolate) produced by four different companies and pie chart (ii) shows distribution of total chocolate cookies produced by these four companies. Read the data carefully and answer the questions.

Total cookies (Butter + Chocolate) produced



Total chocolate cookies produced



Note – Total number of butter cookies produced by A and B is 110 & 30 respectively.

31. Find total butter cookies produced by company C is how much less than the total butter cookies produced by company D?
 (a) 40 (b) 60 (c) 20 (d) 80 (e) 100
32. Find the ratio of total butter cookies produced by all four companies to total chocolate cookies produced by all four companies?
 (a) 1 : 3 (b) 2 : 3 (c) 4 : 5 (d) 2 : 5 (e) 3 : 4
33. If a pie – chart of total butter cookies produced by all four companies made, then find the central angle for total butter cookies produced by company C?
 (a) 117° (b) 108° (c) 99° (d) 121° (e) 95.4°
34. Find the difference between total chocolate cookies produced by company B and total butter cookies produced by company D?
 (a) 50 (b) 40 (c) 10 (d) 30 (e) 20
35. Company C & D sold 60% & 80% of total produced butter cookies respectively. If company C & D sold each butter cookies at Rs. 12 & Rs. 15 respectively, then find total revenue got by company C is what percent less than total revenue got by company D by selling these butter cookies?
 (a) 64% (b) 44% (c) 52% (d) 48% (e) 56%

Previous Years' Solutions of Mains

1. (b); Profit % of company D in 2016 = $\frac{2}{8} \times 100 = 25\%$

$$\text{Income of C in 2015} = \frac{10}{6} \times \frac{100}{7} \times \frac{5}{100} \times 7$$

$$= \frac{350}{42} \text{ million} = \frac{25}{3}$$

$$\text{Total income} = \frac{25}{3}$$

$$\text{Profit \%} = 25\%$$

$$\text{Expenditure} = \frac{25}{3} \times \frac{100}{125} = \frac{20}{3}$$

$$\text{Profit of C} = \frac{25}{3} - \frac{20}{3} = \frac{5}{3} \text{ million}$$

2. (a); Income of E in 2015 = $\frac{13860}{100} \times 21 = 2910.6$

$$\text{Income of A in 2016} = \frac{13860 \times 7 \times 11}{5 \times 100} = 2134.44$$

$$\text{Required difference} = 776.16 \approx 776 \text{ million}$$

3. (d); Required Ratio = $\frac{\frac{5x}{100} \times 9}{\frac{7x}{100} \times 24} = \frac{15}{56}$

4. (b); Total Income of all firms in 2015 = $\frac{5}{2}N$

$$\text{Total Income of all firms in 2016} = \frac{7}{2}N$$

$$\text{Average of firm A, B and C in 2015} = \frac{5N \times 23}{2 \times 100 \times 3}$$

$$\text{Average of firm B, C and D in 2016} = \frac{7N \times 18}{2 \times 100 \times 3}$$

$$\text{Required difference} = \frac{7N \times 18}{2 \times 100 \times 3} - \frac{5N \times 23}{2 \times 100 \times 3}$$

$$= \frac{N}{600} (7 \times 18 - 5 \times 23)$$

$$= \frac{N}{600} (126 - 115) = \frac{11N}{600}$$

5. (a); Income of G in 2015 = $\frac{5x}{100} \times 44$

$$\text{Income of G in 2016} = \frac{5x}{100} \times 44 \times \frac{12}{11}$$

$$\text{Percentage distribution of G for 2016}$$

$$= \frac{\frac{5x}{100} \times 12 \times 4}{7x} \times 100 = \frac{240}{7}\%$$

$$\text{Percentage distribution of F for 2016}$$

$$= 100 - \left(\frac{240}{7} + 11 + 4 + 8 + 6 + 24 \right)$$

$$= 100 - \left(\frac{240}{7} + 53 \right) = \frac{89}{7}\%$$

6. (d); Number of female students in Chemical Engineering = 18% of 2400 = 432

$$\text{Number of male students in Civil Engineering}$$

$$= 16\% \text{ of } 5400 - 12\% \text{ of } 2400$$

$$= 864 - 288 = 576$$

$$\text{Required \%} = \frac{432}{576} \times 100 = 75\%$$

7. (b); Number of female students in Mechanical and Computer Engineering together

$$= (14 + 26)\% \text{ of } 2400 = 40\% \text{ of } 2400 = 960$$

$$\text{Number of male students in Electronics and Civil Engineering together}$$

$$= (26 + 16)\% \text{ of } 5400 - (30 + 12)\% \text{ of } 2400$$

$$= 42\% \text{ of } 5400 - 42\% \text{ of } 2400$$

$$= 2268 - 1008 = 1260$$

$$\text{Required ratio} = \frac{960}{1260} = \frac{16}{21}$$

8. (d); Number of female students in Biotechnology

$$= \frac{6}{11} \times \frac{11}{12} \times \frac{12}{100} \times 5400 = 324$$

Number of female students in Chemical Engineering = 18% of 2400 = 432
Required Difference = 432 - 324 = 108

9. (c); Total number of male students in Computer, Electronics and Chemical Engineering
= (28 + 26 + 12)% of 5400 - (26 + 30 + 18)% of 2400
= 66% of 5400 - 74% of 2400
= 3564 - 1776 = 1788

10. (a); Number of male students in Mechanical and Electronics Engineering together
= (18 + 26)% of 5400 - (14 + 30)% of 2400
= 44% of 5400 - 44% of 2400
= 2376 - 1056 = 1320
Number of male students in Computer, Civil and Chemical Engineering together
= (28 + 16 + 12)% of 5400 - (26 + 12 + 18)% of 2400
= 56% of 5400 - 56% of 2400
= 3024 - 1344 = 1680
Difference between averages = $\frac{1320}{2} - \frac{1680}{3}$
= 660 - 560 = 100

11. (b); Required difference

$$= \left[\left(100 - 44\frac{4}{9} \right) \% \text{ of } 4590 - \left(1 - \frac{5}{14} \right) \text{ of } 1456 \right]$$

$$= 2550 - 936 = 1614$$

12. (d); Required % = $\frac{(4590+5610)-(1904+672)}{1904+672} \times 100$
= $\frac{7624}{2576} \times 100 \approx 296\%$

13. (c); Required fraction = $\frac{18870}{2688} \approx 7.02$

14. (a); Required Ratio = (2040 + 3570) : (1456 + 2128)
= 5610 : 3584 = 2805 : 1792

15. (e); Required difference = (1904 + 2040) - $\frac{20}{100} \times 6630$
= 3944 - 1326 = 2618

16. (a); No. of persons who booked rooms in Kasauli Continental
= $300 \times \frac{100}{30} \times \frac{25}{100} = 250$
No. of persons who showed up in Kasauli Continental = 240

No. of persons who booked rooms in Whispering woods = $300 \times \frac{100}{30} \times \frac{20}{100} = 200$

No. of persons who showed up in Whispering woods = $240 \times \frac{100}{30} \times \frac{17.5}{100} = 140$

$$\text{Req. Ratio} = \frac{250-240}{200-140} = \frac{10}{60} = \frac{1}{6}$$

17. (b); No. of persons who booked in Himalayan Inn = 100

No. of persons who showed up Himalayan Inn
= $240 \times \frac{100}{30} \times \frac{7}{100} = 56$

Profit made on account of those who didn't show up = (100 - 56) × 3000 = Rs. 132000

18. (c); No. of persons who didn't show up in Whispering woods = 200 - 140 = 60

No. of couples = $\frac{60}{2} = 30$

No. of persons who didn't show up in Pinewood

$$= 1000 \times \frac{15}{100} - 800 \times \frac{8}{100}$$

$$= 150 - 64 = 86$$

$$\text{Req. \%} = \frac{30}{86} \times 100 \approx 35\%$$

19. (d); Overall revenue for Exotica

$$= \frac{3}{10} \times 200 \times 5000 + \frac{7}{10} \times 200 \times 5500$$

$$= \text{Rs. } 10,70,000$$

20. (c); No. of person who booked hotel in Pinewood

$$= \frac{300}{30} \times 15 = 150$$

$$\text{Required percentage} = \frac{\frac{240}{30} \times 15}{250} \times 100 = \frac{12000}{250} = 48\%$$

21. (a); Required ratio = $\frac{\text{Percentage of total student}}{\text{Percentage of girls}}$

$$\text{For science} = \frac{11}{22} = 0.5$$

$$\text{For computer} = \frac{8}{12} = 0.66$$

$$\text{For Maths} = \frac{13}{23} = 0.565$$

$$\text{For English} = \frac{15}{8} = 1.875$$

$$\text{For Hindi} = \frac{32}{19} = 1.684$$

$$\text{For Sanskrit} = \frac{21}{16} = 1.3125$$

∴ Ratio for science is minimum

22. (c); Total no. of girls studying = $\frac{3}{8} \times 48 = 18$ thousands

Difference between no. of girls interested in studying computer and that of science.
= 10% of 18 thousand = 1.8 thousand

23. (a); Boys interested in computer

$$= \frac{8}{100} \times 48 - \frac{12}{100} \times 18 = 1.68 \text{ thousand}$$

Boys interested in English

$$\frac{15}{100} \times 48 - \frac{8}{100} \times 18 = 5.76 \text{ thousand}$$

Girls interested in Sanskrit

$$= \frac{16}{100} \times 18 = 2.88 \text{ thousand}$$

$$\text{Girls interested in Maths} = \frac{23}{100} \times 18 \\ = 4.14 \text{ thousands}$$

$$\therefore \text{Required ratio} = \frac{5.76+1.68}{2.88+4.14} = \frac{124}{117}$$

$$24. (b); \text{Required ratio} = \frac{21+13}{11+32} = 34 : 43$$

$$25. (a); \text{No. of boys studying Hindi} = \frac{32}{100} \times 48 - \frac{19}{100} \times 18 \\ = 15.36 - 3.42 = 11.94$$

$$\text{No. of boys studying English} = \frac{15}{100} \times 48 - \frac{8}{100} \times 18 \\ = 7.20 - 1.44 = 5.76$$

\therefore required percentage

$$= \frac{4.86}{17.7} \times 100 \approx 27.457\% \approx 27\%$$

26. (b): let total voters from village Z2 & Z4 is $3x^\circ$ & $7x^\circ$ respectively

$$\text{Total voters from village Z3} = (252^\circ - 10x^\circ)$$

$$\text{ATQ, } 252^\circ - 10x^\circ > 3x^\circ$$

Check using options

Only at 54° , above equations satisfies

$$\text{Z2 (registered voters)} = 54^\circ$$

$$\text{Z3 (registered voters)} = 72^\circ$$

$$\text{Z4 (registered voters)} = 126^\circ$$

$$27. (e): \text{ATQ, } 54^\circ = 10800$$

$$\text{Valid votes in Z2} = \frac{98}{100} \times 10800 = 10584$$

$$\text{Z4} = 126^\circ = 25200$$

Since valid votes in Z4 can either be 480 more or less than that of from Z2

$$\text{Valid votes from Z4} = 480 + 10584 = 11064$$

$$\text{Valid votes from Z4} = 10584 - 480 = 10104$$

$$\text{Invalid votes from Z4} = 25200 - 11064 = 14136$$

$$\text{Or, } 25200 - 10104 = 15096$$

$$\text{Total registered voters} = 360^\circ = 72000$$

$$\text{Total invalid votes} = 20\% \text{ of total registered votes} \\ = 14400$$

Since invalid votes from Z4 should be less than total registered votes

$$\text{So, valid votes Z4} = 11064$$

$$\text{Invalid votes from Z4} = 14136$$

$$\text{Required difference} = 14136 - 11064 = 3072$$

$$28. (d): \text{total voters from Z3} = 72^\circ$$

Central angle corresponding to valid votes of Z3 < central angle corresponding to total voters Z3

Only satisfying value = 60°

$$29. (a): \text{invalid voters from Z1} = 2200$$

$$\text{Invalid voters from Z2} = 1800$$

$$\text{Total registered voters from Z2} = \frac{100}{20} \times 1800 = 9000$$

$$54^\circ = 9000$$

$$\text{Required valid voters from Z3} = \frac{60}{54} \times 9000 = 10000$$

$$30. (c): \text{let valid voters from Z1 be } a$$

Valid voters from Z4 are more than that of Z2

$$\text{So, valid voters from Z4} = 480 + 3600 = 4080$$

$$a + 4080 = 10800$$

$$a = 6720$$

$$\text{valid voters from Z3} = \frac{4}{3}(b - a) = \frac{4}{3}(6720 - 3600) \\ = 4160$$

Sol. (31 -35):

For total cookies produced pie chart

$$2N\% + (N + 5)\% + N\% + (N + 20)\% = 100\%$$

$$(5N + 25)\% = 100\%$$

$$5N = 75$$

$$N = 15$$

Let total cookies produced by all four companies = $100x$

$$\text{So, total cookies produced by A} = 100x \times \frac{(15+5)}{100} = 20x$$

$$\text{Total cookies produced by B} = 100x \times \frac{15}{100} = 15x$$

$$\text{Total cookies produced by C} = 100x \times \frac{(15+20)}{100} = 35x$$

$$\text{Total cookies produced by D} = 100x \times \frac{2 \times 15}{100} = 30x$$

Similarly, for total chocolate cookies produced pie chart

$$(M + 10)\% + M\% + 20\% + 40\% = 100\%$$

$$(2M + 70)\% = 100\%$$

$$2M = 30$$

$$M = 15$$

Let total chocolate cookies produced by all four companies = $100y$

$$\text{So, total chocolate cookies produced by A} = 100y \times \frac{15}{100} = 15y$$

$$\text{Total chocolate cookies produced by B} = 100y \times \frac{20}{100} = 20y$$

$$\text{Total chocolate cookies produced by C} = 100y \times \frac{40}{100} = 40y$$

$$\text{And total chocolate cookies produced by D} = 100y \times \frac{(15+10)}{100} = 25y$$

Give,

$$20x - 15y = 110$$

$$\text{Or, } 4x - 3y = 22 \text{ ----- (i)}$$

$$\text{And, } 15x - 20y = 30$$

$$3x - 4y = 6 \text{ ----- (ii)}$$

From (i) and (ii) we get –

$$x = 10, y = 6$$

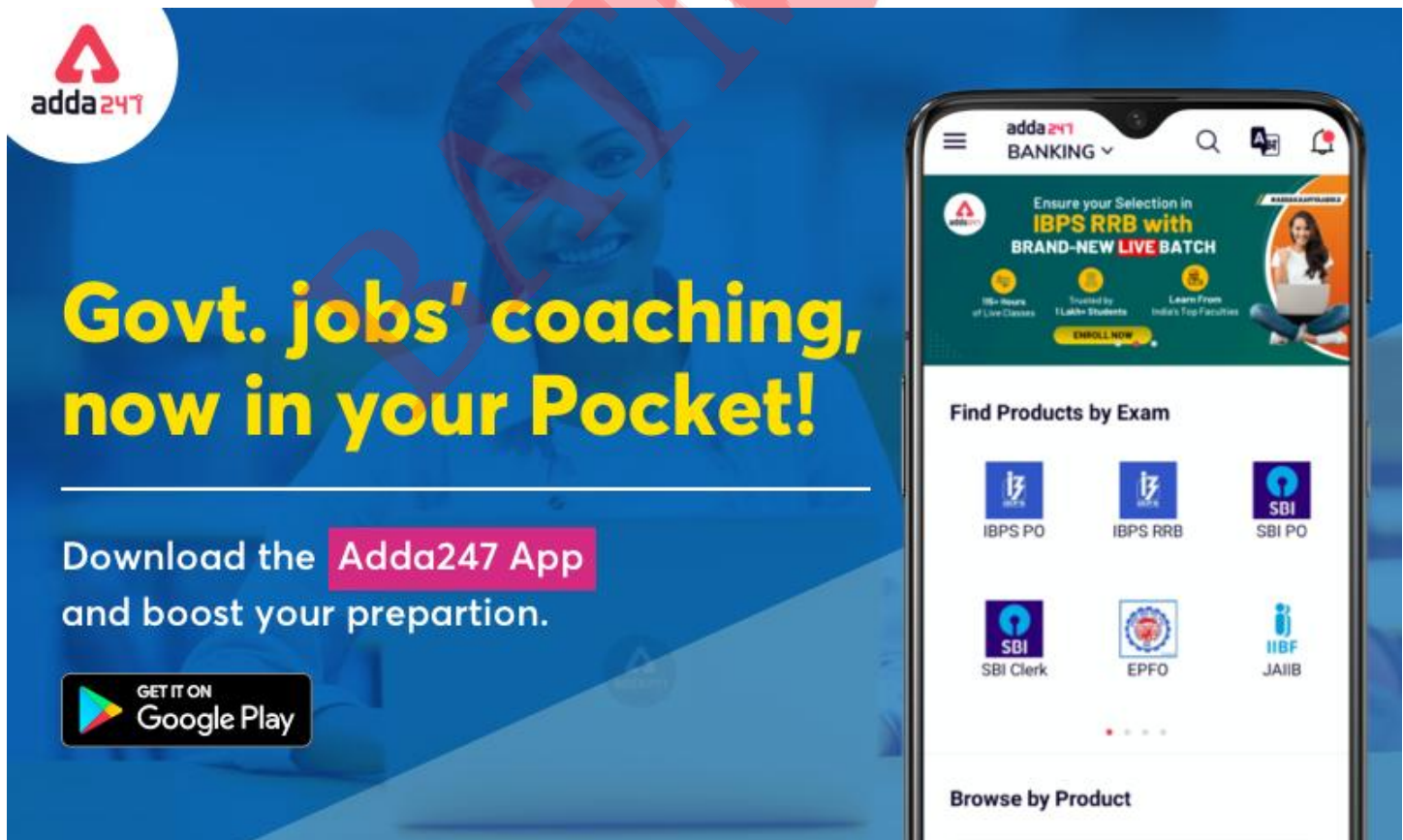
- 31. (a):** Required difference
 $= (30 \times 10 - 25 \times 6) - (35 \times 10 - 40 \times 6)$
 $= 150 - 110$
 $= 40$
- 32. (b):** Required ratio $= (100 \times 10 - 100 \times 6) : 100 \times 6$
 $= 400 : 600$
 $= 2 : 3$
- 33. (c):** Total butter cookies produced by all four companies $= 100 \times 10 - 100 \times 6 = 400$
 Total butter cookies produced by company C $= (35 \times 10 - 40 \times 6) = 110$
 Required angle $= \frac{110}{400} \times 100 \times 3.6 = 99^\circ$
- 34. (d):** Total chocolate cookies produced by

$$B = 20 \times 6 = 120$$

Total butter cookies produced by
 $D = (30 \times 10 - 25 \times 6) = 150$
 Required difference $= 150 - 120 = 30$

- 35. (e):** Total butter cookies produced by company
 $C = (35 \times 10 - 40 \times 6) = 110$
 Total butter cookies produced by
 $D = (30 \times 10 - 25 \times 6) = 150$
 Total revenue got by company
 $C = 110 \times \frac{60}{100} \times 12 = 792$
 Total revenue got by company
 $D = 150 \times \frac{80}{100} \times 15 = 1800$
 Required percentage $= \frac{1800 - 792}{1800} \times 100 = 56\%$

.....



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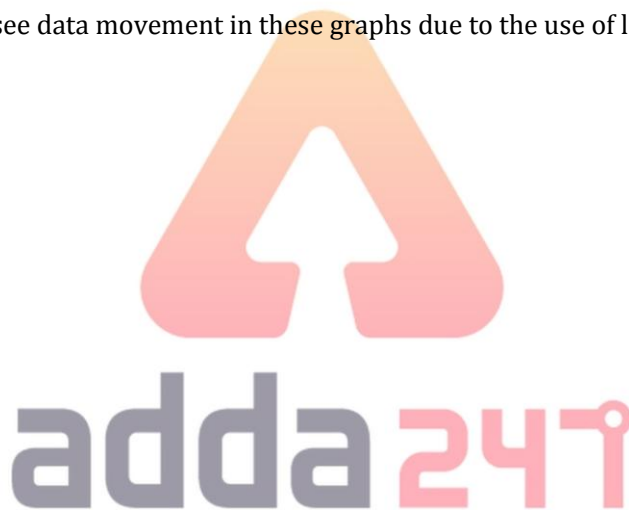
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Chapter 04

Line Graph

Line Graphs are very useful in representing the data related to time-series and frequency distribution. These graphs are also very useful in determining trends, rate of change and for illustrating comparisons with respect to some time series. A time series is an arrangement of data in chronological order. Line graphs are drawn by lines connecting the dots which show the value of a variable. It indicates the variation of one parameter with respect to another. It determines trends and rate of change over the time. These graphs are easier to interpret as we can easily see data movement in these graphs due to the use of lines.



This chapter contains:

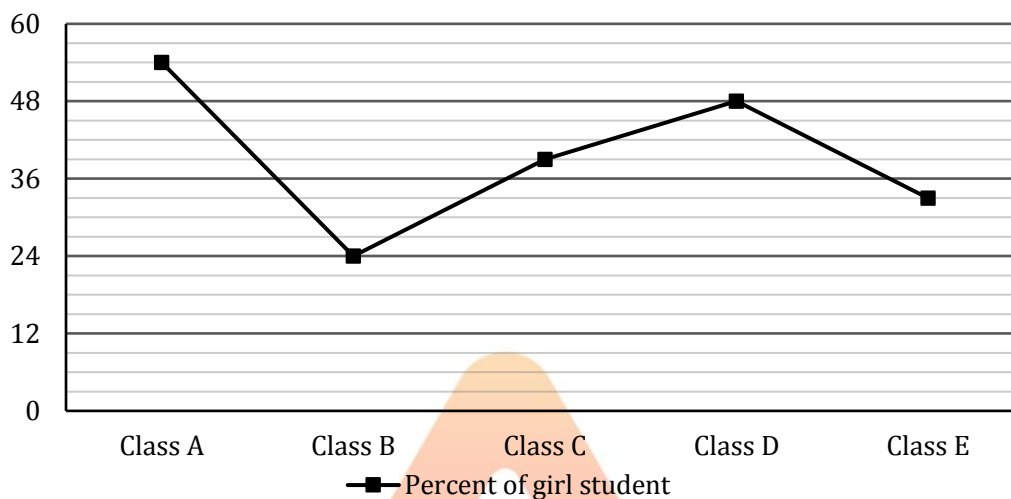
- Concept with Solved Examples
- Practice MCQs for Prelims
- Practice MCQs for Mains
- Previous Years' Questions of Prelims
- Previous Years' Questions of Mains

Solved Examples

Direction (1-5): Line graph given below shows percentage of girls out of total students in 5 different classes (A, B, C, D, and E). Study the graph carefully and answer the questions given below.

Total number of students in each class is 300.

Total number of students in any class = total number of (boy + girl) student in that class.



- The number of girls in class D is how many more or less than the number of girls in class E?
(a) 51 (b) 52 (c) 44 (d) 45 (e) 48
- Find the average number of boys in class A, B and D?
(a) 159 (b) 180 (c) 165 (d) 195 (e) 174
- In which class the number of girls is lowest?
(a) Class C (b) Class B (c) Class D (d) Class A (e) Class E
- Total girls in class E is approx. what percent of the number of boys in class A?
(a) 72% (b) 80% (c) 59% (d) 65% (e) 75%
- Find out the difference between the total number of boys and total number of girls in all the classes together?
(a) 300 (b) 312 (c) 332 (d) 348 (e) 306

1. **(d):** Required difference = $\frac{48-33}{100} \times 300 = 45$

2. **(e):** Required average = $\frac{1}{3} \left(300 \times \frac{100-54}{100} + 300 \times \frac{100-24}{100} + 300 \times \frac{100-48}{100} \right)$
 $= \frac{1}{3} (138 + 228 + 156) = 174$

3. **(b):** From graph it is clear that in class B, there is lowest number of girls, which is 24%.
 (as number of total students are same in each class):

4. **(a):** Required percentage = $\frac{300 \times \frac{33}{100}}{300 \times \frac{100-54}{100}} \times 100 = 71.74\% = 72\%$ (approx.):

5. **(b):** Total number of girls in all the classes together = $300 \times \frac{54}{100} + 300 \times \frac{24}{100} + 300 \times \frac{39}{100} + 300 \times \frac{48}{100} + 300 \times \frac{33}{100}$
 $= 594$

So, total number of boys in all the classes together = $1500 - 594 = 906$

So, Required difference = $906 - 594 = 312$

Directions (6-10): Study the line graph given below and answer the following questions.

Line graph shows the number of pens sold by 4 different shopkeepers (A, B, C & D) in 2015 and 2016.



6. Find average number of pens sold by C & D in both the years.
 (a) 354 (b) 344 (c) 352 (d) 342 (e) 337
7. Find ratio of pens sold by B & C together in 2015 to pens sold by B & C together in 2016.
 (a) 1: 1 (b) 2 : 3 (c) 8 : 9 (d) 5 : 6 (e) 5 : 4
8. Number of pens sold by A & C together in 2016 are what percent more than those sold by B in 2015?
 (a) $116\frac{2}{3}\%$ (b) 110% (c) 125% (d) 112.5% (e) 120%
9. Number of pens sold by A, C & D together in 2015 are how much more or less than pens sold by these shopkeepers together in 2016?
 (a) 4 (b) 6 (c) 8 (d) 12 (e) 9
10. Find the total number of pens sold by all shopkeepers in 2016?
 (a) 672 (b) 674 (c) 682 (d) 688 (e) 692

6. **(b):** Required average = $\frac{(190+172)+(162+164)}{2}$
 = 344

7. **(a):** Required ratio = $\frac{160+190}{178+172}$
 = $\frac{350}{350} = 1: 1$

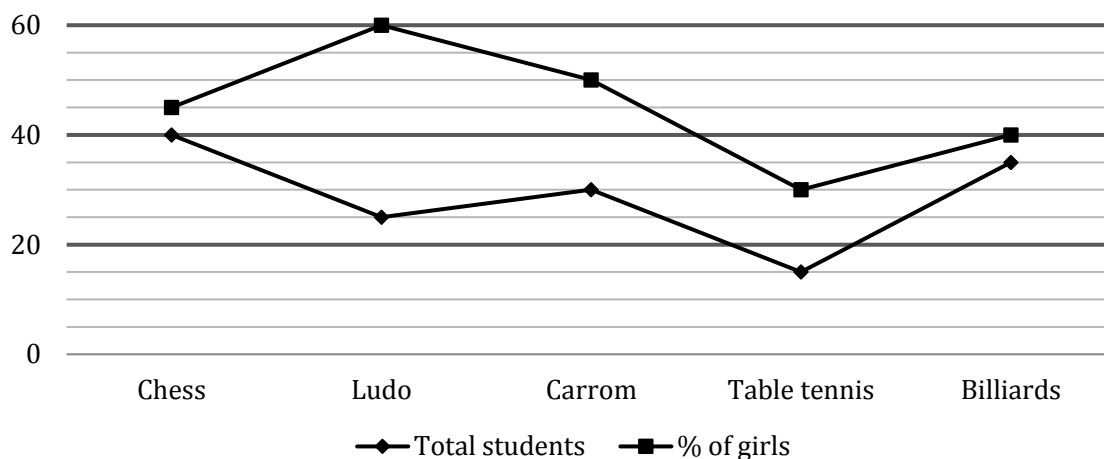
8. **(d):** Required % = $\frac{\{(168+172)-160\}}{160} \times 100$
 = 112.5 %

9. **(b):** Required difference = $(158 + 190+162) - (168 + 172+164) = 510 - 504 = 6$

10. **(c):** Required total number of pens = $168+178+172+164=682$

Directions (11-15): Study the line chart given below and answer the following questions.

Line chart shows the total number of students (in '00) who play 5 different games (Chess, Ludo, Carrom, Table tennis and Billiards) and percentage of girls playing these 5 games.



Note - % of girls playing any game = $\frac{\text{Number of girls playing that game}}{\text{Number of total students playing that game}} \times 100$

11. Boys playing Chess are what percent of girls playing Ludo & Carrom together?
 (a) $62\frac{2}{3}\%$ (b) $73\frac{1}{3}\%$ (c) $78\frac{2}{3}\%$ (d) $68\frac{1}{3}\%$ (e) $75\frac{2}{3}\%$
12. Find ratio of boys playing Carrom and Billiards together to girls playing Table tennis.
 (a) 8 : 1 (b) 3 : 1 (c) 5 : 1 (d) 9 : 1 (e) 6 : 1
13. Average number of girls playing Chess, Ludo & Table tennis is what percent more or less than boys playing Ludo & Carrom together?
 (a) 70% (b) 30% (c) 90% (d) 50% (e) 80%
14. If total students playing Cards are 60% more than total students playing Ludo and ratio of boys to girls playing Cards is 7 : 3, then find boys playing Cards and Ludo together are how much more or less than girls playing Cards and Chess together?
 (a) 200 (b) 1600 (c) 1300 (d) 500 (e) 800
15. Boys playing Chess, Ludo and Table tennis together are how much more or less than girls playing Carrom and Billiards together?
 (a) 1600 (b) 1250 (c) 1350 (d) 1900 (e) 1850

11. (b): Boys playing Chess = $4000 \times \frac{100-45}{100} = 2200$

Girls playing Ludo & Carrom together = $2500 \times \frac{60}{100} + 3000 \times \frac{50}{100}$
 $= 1500 + 1500 = 3000$

Required % = $\frac{2200}{3000} \times 100 = 73\frac{1}{3}\%$

12. (a): Boys playing Carrom and Billiards together = $3000 \times \frac{100-50}{100} + 3500 \times \frac{100-40}{100}$
 $= 1500 + 2100 = 3600$

Girls playing Table tennis = $1500 \times \frac{30}{100} = 450$

Required ratio = $\frac{3600}{450} = 8 : 1$

13. (d): Average number of girls playing Chess, Ludo & Table tennis

$= \frac{1}{3} \times \left(\left(4000 \times \frac{45}{100} \right) + \left(2500 \times \frac{60}{100} \right) + \left(1500 \times \frac{30}{100} \right) \right)$

$$= \frac{1}{3} \times (1800 + 1500 + 450) = 1250$$

$$\text{Boys playing Ludo \& Carrom together} = 2500 \times \frac{100-60}{100} + 3000 \times \frac{100-50}{100}$$

$$= 1000 + 1500 = 2500$$

$$\text{Required \%} = \frac{2500-1250}{2500} \times 100 = 50\%$$

14. (e): Total students playing Cards = $\frac{160}{100} \times 2500 = 4000$

$$\text{Boys playing Cards and Ludo together} = 4000 \times \frac{7}{10} + 2500 \times \frac{100-60}{100}$$

$$= 2800 + 1000 = 3800$$

$$\text{Girls playing Cards and Chess together} = 4000 \times \frac{3}{10} + 4000 \times \frac{45}{100}$$

$$= 1200 + 1800 = 3000$$

$$\text{Required difference} = 3800 - 3000 = 800$$

15. (c): Boys playing Chess, Ludo and Table tennis together

$$= \left(4000 \times \frac{100-45}{100}\right) + \left(2500 \times \frac{100-60}{100}\right) + \left(1500 \times \frac{100-30}{100}\right)$$

$$= 2200 + 1000 + 1050 = 4250$$

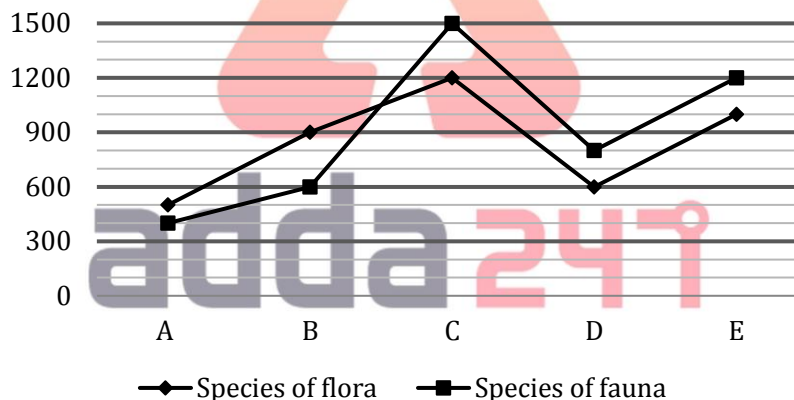
$$\text{Girls playing Carrom and Billiards together} = \left(3000 \times \frac{50}{100}\right) + \left(3500 \times \frac{40}{100}\right)$$

$$= 1500 + 1400 = 2900$$

$$\text{Required difference} = 4250 - 2900 = 1350$$

Directions (16-20): Study the line chart given below and answer the following questions.

Line chart shows the number of species of flora and species of fauna in 5 different jungles (A, B, C, D & E) in 2018.



16. Species of flora in B & D together in 2018 is what percent more/less than species of fauna in A & E together in 2018?

- (a) $25\frac{3}{4}\%$ (b) $38\frac{1}{4}\%$ (c) $45\frac{3}{4}\%$ (d) $6\frac{1}{4}\%$ (e) $18\frac{1}{4}\%$

17. If species of flora in A & in C in 2019 are increased by 40% and 25% respectively as compared to 2018, then find species of flora in A & C together in 2019 are how much more/less than species of fauna in C & D together in 2018?

- (a) 100 (b) 500 (c) 200 (d) 400 (e) 300

18. Average of species of fauna in A, B, D & E in 2018 is what percent of species of flora in C in 2018?

- (a) 50% (b) 75% (c) 62.5% (d) 87.5% (e) 37.5%

19. Find ratio of species of flora in A, B & D together in 2018 to species of fauna in C & E together in 2018.

- (a) 25 : 32 (b) 20 : 27 (c) 2 : 3 (d) 5 : 9 (e) 4 : 5

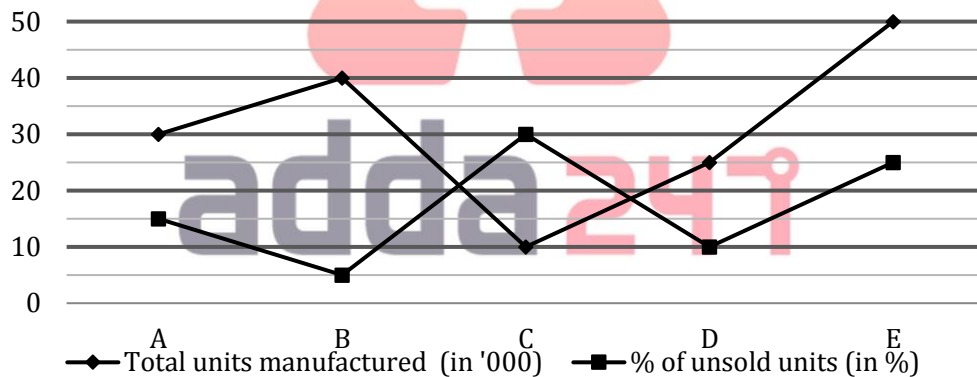
20. In 2018, if species of flora in F are $33\frac{1}{3}\%$ less than that of in B and species of fauna in F are 25% more than that of in D, then find species of flora and fauna together in F in 2018 are how much more/less than species of flora and fauna together in B in 2018?

- (a) 800 (b) 500 (c) 200 (d) 400 (e) 100

16. (d): Species of flora in B & D together in 2018 = $900 + 600 = 1500$
Species of fauna in A & E together in 2018 = $400 + 1200 = 1600$
Required % = $\frac{1600-1500}{1600} \times 100 = 6\frac{1}{4}\%$
17. (a): Species of flora in A & C together in 2019 = $\left(\frac{140}{100} \times 500\right) + \left(\frac{125}{100} \times 1200\right) = 2200$
Species of fauna in C & D together in 2018 = $1500 + 800 = 2300$
Required difference = $2300 - 2200 = 100$
18. (c): Average of species of fauna in A, B, D & E in 2018 = $\frac{400+600+800+1200}{4} = 750$
Required % = $\frac{750}{1200} \times 100 = 62.5\%$
19. (b): Species of flora in A, B & D together in 2018 = $500 + 900 + 600 = 2000$
Species of fauna in C & E together in 2018 = $1500 + 1200 = 2700$
Required ratio = $\frac{2000}{2700} = 20 : 27$
20. (e): Sol. Species of flora and fauna together in F in 2018 = $\left(\frac{200}{300} \times 900\right) + \left(\frac{125}{100} \times 800\right) = 1600$
Species of flora and fauna together in B in 2018 = $900 + 600 = 1500$
Required difference = $1600 - 1500 = 100$

Directions (21-25): Study the line chart given below and answer the following questions.

Line chart shows the total (sold + unsold) number of units manufactured (in '000) of 5 different products (A, B, C, D & E) and percentage of unsold units of these products.

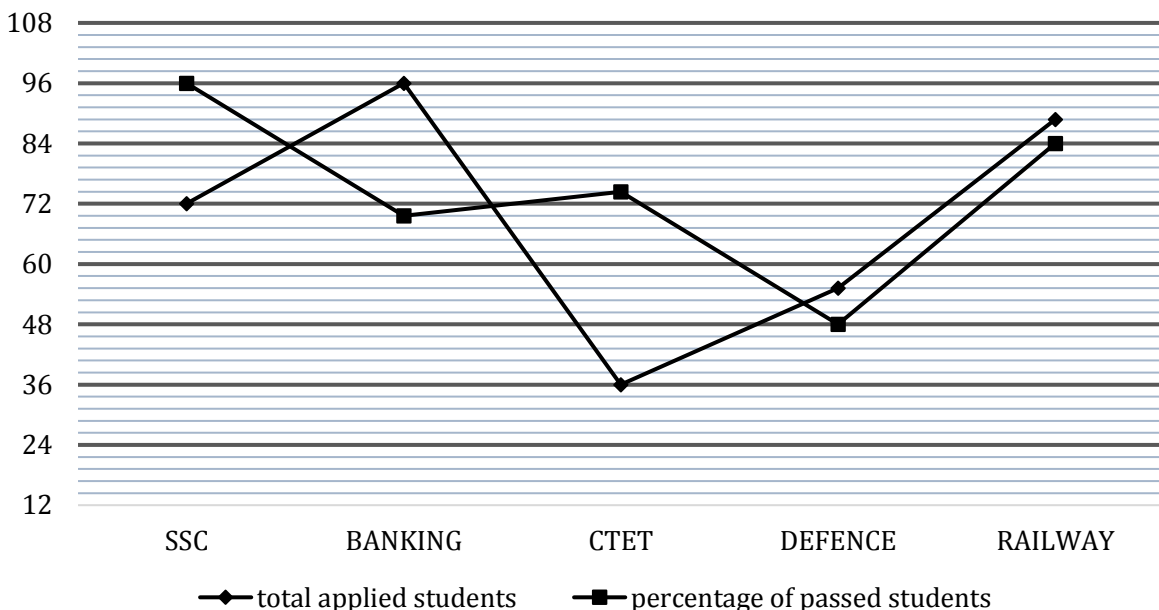


Note – Percentage of unsold units of any product = $\frac{\text{Total unsold units of that product}}{\text{Total manufactured units of that product}} \times 100$

21. Sold units of B & C together are what percent of total units manufactured of E?
(a) 70% (b) 50% (c) 90% (d) 80% (e) 60%
22. Find ratio of sold units of D & E together to unsold units of A & B together.
(a) 13 : 120 (b) 132 : 17 (c) 109 : 11 (d) 120 : 13 (e) 17 : 132
23. Find the average of unsold units of C, D & E.
(a) 6000 units (b) 8000 units (c) 5500 units (d) 4000 units (e) 3500 units
24. Total units manufactured of B & C together are what percent more or less than total units manufactured of A & E together?
(a) 75% (b) 50% (c) 62.5% (d) 87.5% (e) 37.5%
25. Find total units sold of A, B, C, D & E together.
(a) 128500 units (b) 134500 units (c) 116500 units (d) 124500 units (e) 130500 units

21. (c): Sold units of B & C together = $\left(40000 \times \frac{100-5}{100}\right) + \left(10000 \times \frac{100-30}{100}\right)$
 $= 38000 + 7000 = 45000$ units
Required % = $\frac{45000}{50000} \times 100 = 90\%$
22. (d): Sold units of D & E together = $\left(25000 \times \frac{100-10}{100}\right) + \left(50000 \times \frac{100-25}{100}\right)$
 $= 22500 + 37500$
 $= 60000$ units
Unsold units of A & B together = $\left(30000 \times \frac{15}{100}\right) + \left(40000 \times \frac{5}{100}\right)$
 $= 4500 + 2000$
 $= 6500$ units
Required ratio = $\frac{60000}{6500} = 120 : 13$
23. (a): Required average = $\frac{1}{3} \times \left(\left(10000 \times \frac{30}{100}\right) + \left(25000 \times \frac{10}{100}\right) + \left(50000 \times \frac{25}{100}\right)\right)$
 $= \frac{1}{3} \times (3000 + 2500 + 12500)$
 $= 6000$ units
24. (e): Total units manufactured of B & C together = $40000 + 10000$
 $= 50000$
Total units manufactured of A & E together = $30000 + 50000$
 $= 80000$
Required % = $\frac{80000-50000}{80000} \times 100 = 37.5\%$
25. (e): Required units = $\left(30000 \times \frac{100-15}{100}\right) + \left(40000 \times \frac{100-5}{100}\right) + \left(10000 \times \frac{100-30}{100}\right) + \left(25000 \times \frac{100-10}{100}\right) + \left(50000 \times \frac{100-25}{100}\right)$
 $= 25500 + 38000 + 7000 + 22500 + 37500$
 $= 130500$ units

Directions (26-30): Line chart given below gives information about total no. of students (in '00) applied for various exams in a city and percentage of students who passed exam out of total appeared students.

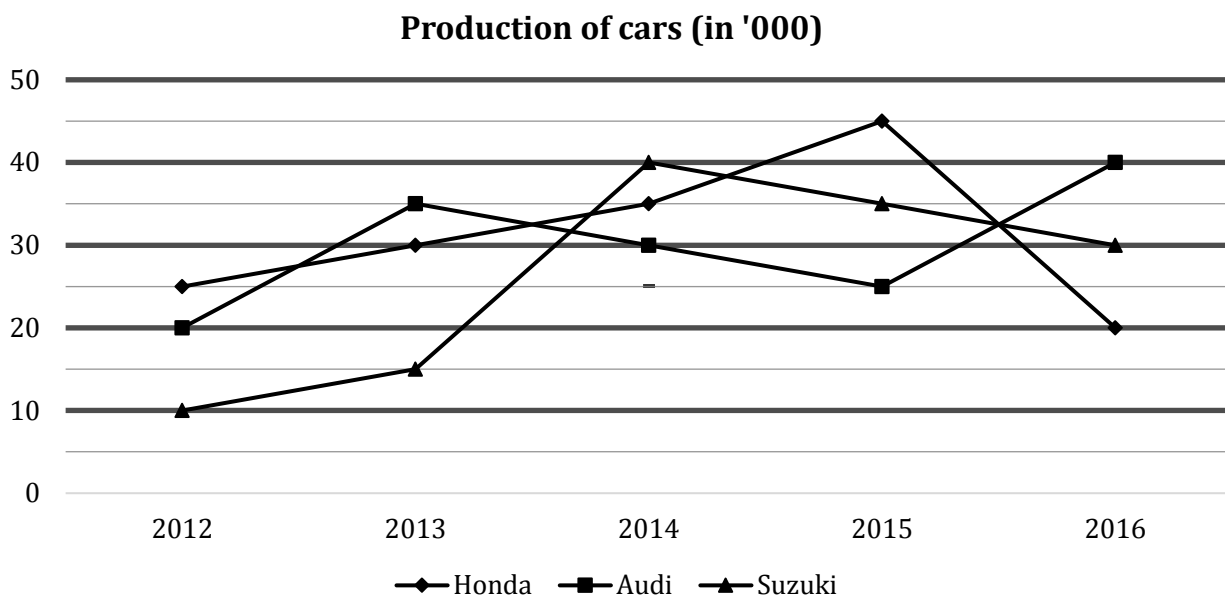


- 26.** If in RAILWAY exams non-appeared students are $5\frac{5}{7}\%$ of total appeared students, then find total students who passed in RAILWAY exams.
 (a) 7046 (b) 8000 (c) 8400 (d) 7056 (e) 8006
- 27.** In SSC exam, out of total applied students 720 students were not able to reach the exam center and another 1080 students didn't take the exam. Find percentage of passed students out of total applied students.
 (a) 72% (b) 75% (c) 84% (d) 48% (e) $83\frac{1}{3}\%$
- 28.** In BANKING exam $83\frac{1}{3}\%$ of total applied students appeared in exam. Find total students who passed BANKING exam.
 (a) 5184 (b) 8008 (c) 5000 (d) 7058 (e) 5568
- 29.** If in DEFENCE exam total 2400 students passed the examination, then find total appeared students in DEFENCE exam is what percent of total no. of applied students in DEFENCE exam. (approx.):
 (a) 95% (b) 91% (c) 96% (d) 92% (e) 89%
- 30.** In CTET exam, 83.2% of appeared boys and 70% of appeared girls passed the exam. If ratio of appeared girls to appeared boys is 2:1 and total 2232 students passed in CTET exam, then find ratio of total applied students to total appeared girls in CTET exam.
 (a) 9:5 (b) 18:1 (c) 6:5 (d) 18:5 (e) 9:4

- 26. (d):** Total applied students in RAILWAY exam = 8880
 Let no. of students who appeared in RAILWAY exam be $70x$
 Then no. of students who did not appeared in exam = $70x \times \frac{40}{700} = 4x$
 ATQ
 $70x + 4x = 8880$
 $x = 120$
 So, $70x = 8400$
 Total students who passed RAILWAY exam = $8400 \times \frac{84}{100} = 7056$
- 27. (a):** Total students applied in SSC exam = 7200
 Total no. of students who appeared in SSC exam = $7200 - 720 - 1080 = 5400$
 Total students who passed SSC exam = $5400 \times \frac{96}{100} = 54 \times 96$
 Required percentage = $\frac{(54 \times 96)}{7200} \times 100 = 72\%$
- 28. (e):** Total no. of students applied in BANKING exam = 9600
 Required no. of students = $9600 \times \frac{250}{300} \times \frac{69.6}{100} = 5568$
- 29. (b):** Total students who applied in DEFENCE exam = 5520
 Total appeared students in DEFENCE exam = $\frac{2400}{48} \times 100 = 5000$
 Required percentage = $\frac{5000}{5520} \times 100 \approx 90\%$
- 30. (a):** total no. of students applied in CTET exam = 3600
 Let total no. of girls who appeared in CTET exam be $2x$
 Then total no. of boys who appeared in CTET exam = x
 ATQ
 $2x \times \frac{70}{100} + x \times \frac{83.2}{100} = 2232$
 $2232x = 2232000$
 $x = 1000$
 Required ratio = $\frac{3600}{2 \times x} = \frac{3600}{2000}$
 $\Rightarrow 9:5$

Directions (31-35): Study the following line-graph carefully to answer the following questions.

Line-graph shows the production of cars i.e. Honda, Audi and Suzuki cars (in thousands) in 5 different years.



31. In year 2017, if demand of Audi and Suzuki cars increases by 4% and 5% respectively as compared to year 2015, due to which production of Audi and Suzuki cars also increases by same percentage and overall cars produced in year 2017 is same as overall cars produced in year 2015. Then find the no. of Honda cars produced in year 2017?
 (a) 48250 (b) 52250 (c) 42250 (d) None of these (e) 42750
32. Total production of Audi cars in 2013, 2014 and 2015 together is what percent more or less than total production of Honda cars in same years together?
 (a) $18\frac{2}{11}\%$ less (b) $20\frac{2}{11}\%$ more (c) $18\frac{2}{11}\%$ more (d) $22\frac{2}{9}\%$ less (e) $22\frac{2}{9}\%$ more
33. If 20%, 25% and 40% Suzuki cars are defective in year 2013, 2014 and 2016 respectively, then find total Suzuki cars which are not defective in all these years together?
 (a) None of these (b) 50000 (c) 40000 (d) 60000 (e) 45000
34. If selling price of each Honda car and Suzuki car is Rs. 3.5 lakh and Rs. 4.5 lakh respectively. Then, find difference (in lakh) between total revenue generated from the sales of Honda cars and Suzuki cars in year 2012, 2013 and 2014 together. (all the cars produced were sold by these two companies):
 (a) Rs. 14500 lakh (b) Rs. 22500 lakh (c) Rs. 26500 lakh (d) Rs. 24500 lakh (e) None of these lakh
35. Find the difference between average of cars produced by Audi and Suzuki in all the five years.
 (a) 2000 (b) 3000 (c) 2500 (d) 4000 (e) 4500

31. (c): In 2017,

$$\text{Production of Audi cars} = 25,000 \times \frac{104}{100}$$

$$= 26,000$$

$$\text{Production of Suzuki cars} = 35,000 \times \frac{105}{100}$$

$$= 36,750$$

$$\text{Total cars produced in 2015} = 45,000 + 35,000 + 25,000$$

$$= 105,000$$

$$\therefore \text{No. of Honda cars produced in 2017} = 105,000 - 26,000 - 36,750$$

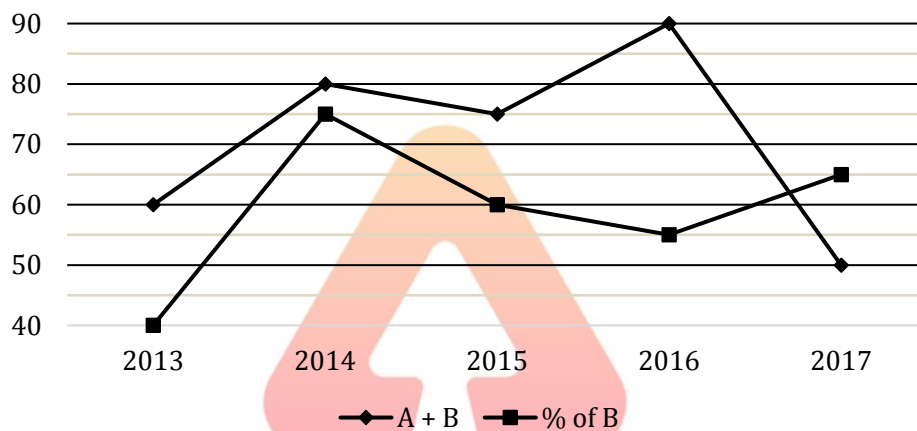
$$= 42,250$$

32. (a): Required percentage = $\frac{(30+35+45)-(35+30+25)}{(30+35+45)} \times 100$

$$= \frac{110-90}{110} \times 100 = 18\frac{2}{11}\% \text{ less}$$

33. (d): Required total = $\frac{80}{100} \times 15,000 + \frac{75}{100} \times 40,000 + \frac{60}{100} \times 30,000$
 $= 12,000 + 30,000 + 18,000$
 $= 60,000$
34. (b): Required difference = $3.5[25 + 30 + 35] \times 1000 - 4.5[10 + 15 + 40] \times 1000$
 $= 315000 - 292500$
 $= \text{Rs. } 22500 \text{ Lakh}$
35. (d): Required difference = $\left[\frac{20+35+30+25+40}{5} - \frac{(10+15+40+35+30)}{5} \right] \times 1000$
 $= 30,000 - 26,000 = 4000$

Directions (36-40): Line graph given below shows total number of books (in hundred) printed by two different publishers A and B together and shows percentage of books printed by publisher B out of total books printed. Read data carefully and answer the following questions:



36. Total books printed by publisher B in year 2015 and 2016 together is what percent more than total books printed by publisher A in year 2013?
 (a) 162.5% (b) 160.25% (c) 164.25% (d) 158.25% (e) 166.25%
37. What is the average number of books printed by publisher A in 2013, 2015 & 2016?
 (a) 3250 (b) 3750 (c) 3500 (d) 3550 (e) 3600
38. Books printed by A in year 2018 is half of the total books printed by both in year 2014 and ratio of books printed by publisher A to B in year 2018 is 5 : 3. Then books printed by publisher B in the year 2018 is how much less than books printed by A in year 2015?
 (a) 800 (b) 400 (c) 600 (d) 200 (e) 500
39. If books printed in 2016 by publisher A is sold at the profit of 25% and selling price of each book is Rs 350, then find the total cost price of all the books which is sold by publisher A in 2016(in Rs.) (A sold all books)?
 (a) 11,36,000 (b) 11,42,000 (c) 11,48,000 (d) 11,32,000 (e) 11,34,000
40. What is the ratio of books printed by publisher A in 2014 and 2017 together to books printed by publisher B in the year 2016?
 (a) 25 : 29 (b) 25 : 27 (c) 25 : 31 (d) 25 : 33 (e) 25 : 36
36. (a): Books printed by publisher B in year 2015 and 2016 = $7500 \times \frac{60}{100} + 9000 \times \frac{55}{100}$
 $= 4500 + 4950 = 9450$
 Total books printed by publisher A in year 2013 = $6000 \times \frac{60}{100} = 3600$
 Required percentage = $\frac{9450-3600}{3600} \times 100$
 $= 162.5\%$

37. (d): Books printed by publisher A in year 2013, 2015 and 2016

$$= 6000 \times \frac{60}{100} + 7500 \times \frac{40}{100} + 9000 \times \frac{45}{100}$$

$$= 3600 + 3000 + 4050$$

$$= 10650$$

$$\text{Required average} = \frac{10650}{3} = 3550$$

38. (c): Total books printed by A in the year 2018 = $8000 \times \frac{1}{2} = 4000$

$$\text{Books printed by B in the year 2018} = 4000 \times \frac{3}{5} = 2400$$

$$\text{Books printed by A in the year 2015} = 7500 \times \frac{40}{100} = 3000$$

$$\text{Required difference} = 3000 - 2400 = 600$$

39. (e): Cost of one book printed in 2016 by publisher A = $350 \times \frac{4}{5} = 280$ Rs.

$$\text{Total cost price of all the books which is sold by publisher A in 2016} = 9000 \times \frac{45}{100} \times 280$$

$$= 11,34,000 \text{ Rs.}$$

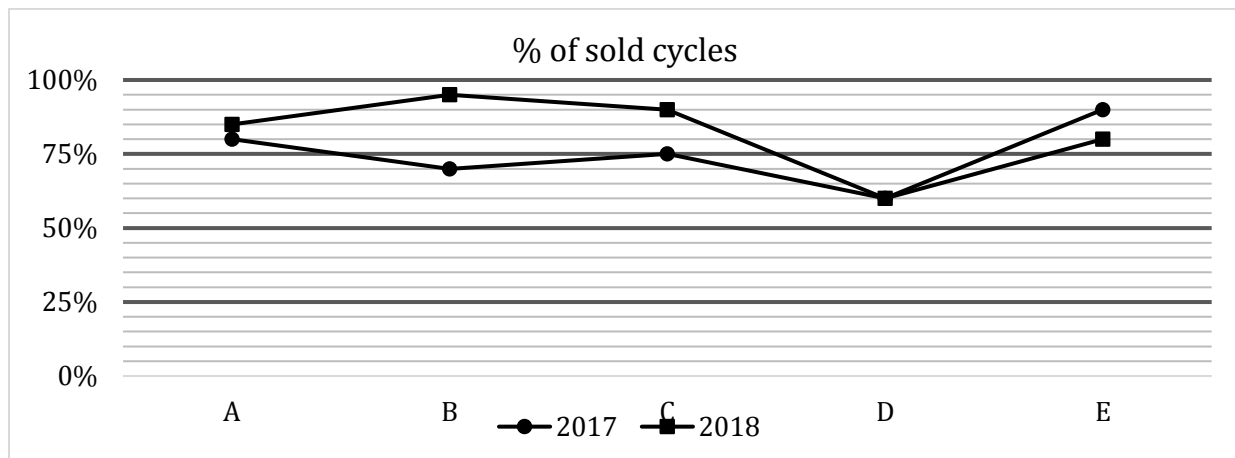
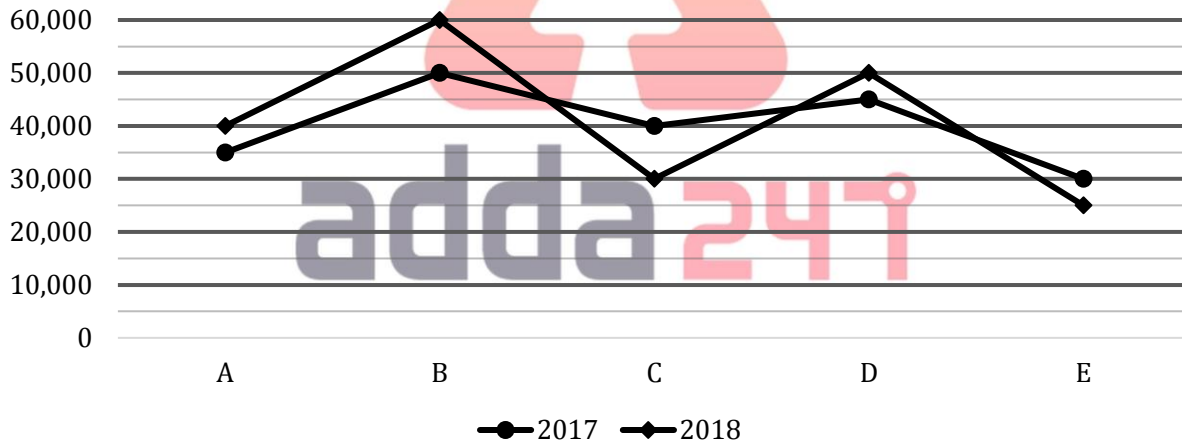
40. (d): Total books printed by publisher A in 2014 and 2017 = $8000 \times \frac{25}{100} + 5000 \times \frac{35}{100}$

$$= 2000 + 1750 = 3750$$

$$\text{Total books printed by publisher B in the year 2016} = 9000 \times \frac{55}{100} = 4950$$

$$\text{Required ratio} = \frac{3750}{4950} = 25 : 33$$

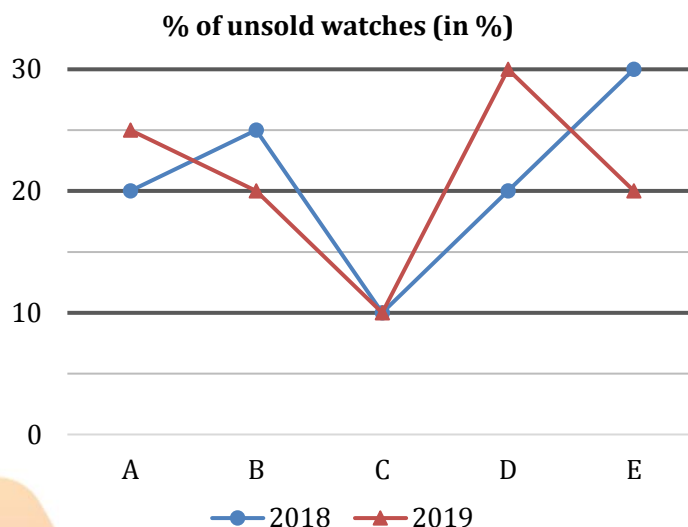
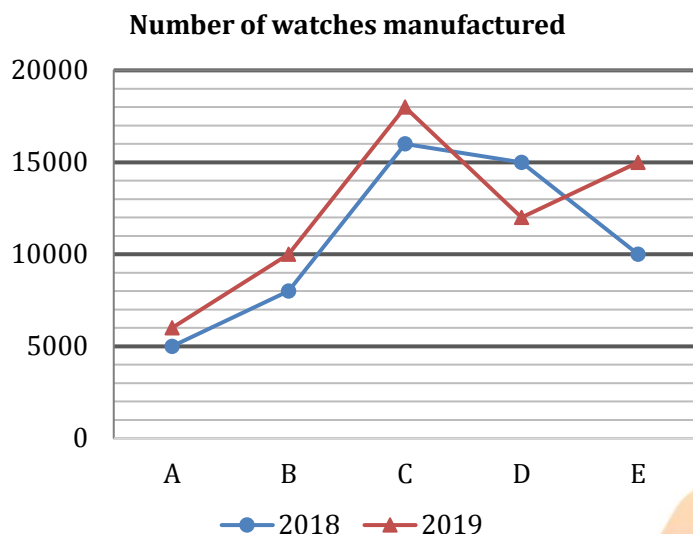
Directions (41-45): Line chart (I) shows the total number of cycles manufactured by five different companies in 2017 & 2018 and line chart (II) shows the percentage of cycles sold out of the total manufactured cycles of these five companies in 2017 & 2018. Study the line chart & bar chart given below and answer the following questions.



- 41.** Cycles sold by companies – B & C together in 2017 are what percent of cycles sold by companies – D & E together in 2018?
 (a) 160% (b) 150% (c) 130% (d) 120% (e) 140%
- 42.** Average number of unsold cycles by companies – B, D & E in 2017 are what percent of total unsold cycles by companies – D & E together in 2018?
 (a) 68% (b) 56% (c) 34% (d) 72% (e) 48%
- 43.** Cycles sold by companies – A & D together in 2017 are how much more or less than cycles sold by companies – B & C together in 2018?
 (a) 29,000 (b) 36,000 (c) 34,000 (d) 31,000 (e) 24,000
- 44.** Find the ratio of cycles sold by company – B in 2017 & 2018 together to cycles sold by companies – A & E together in 2018 respectively.
 (a) None of the below. (b) 46:27 (c) 46:33
 (d) 27:46 (e) 33:46
- 45.** Total unsold cycles by companies – A & C together in 2017 are how much more or less than total unsold cycles by companies – A, B & C together in 2018?
 (a) 9,000 (b) 5,000 (c) 3,000 (d) 6,000 (e) 8,000
- 41. (c):** Cycles sold by companies – B & C together in 2017 = $\left(50,000 \times \frac{70}{100}\right) + \left(40,000 \times \frac{75}{100}\right)$
 = 35,000 + 30,000 = 65,000
 Cycles sold by companies – D & E together in 2018 = $\left(50,000 \times \frac{60}{100}\right) + \left(25,000 \times \frac{80}{100}\right)$
 = 30,000 + 20,000 = 50,000
 Required percentage = $\frac{65,000}{50,000} \times 100 = 130\%$
- 42. (e):** Average number of unsold cycles of companies – B, D & E in 2017 = $\frac{1}{3} \times \left(\left(50,000 \times \frac{100-70}{100}\right) + \left(45,000 \times \frac{100-60}{100}\right) + \left(30,000 \times \frac{100-90}{100}\right) \right)$
 = $\frac{1}{3} \times (15,000 + 18,000 + 3,000) = 12,000$
 Total unsold cycles of companies – D & E together in 2018 = $\left(50,000 \times \frac{100-60}{100}\right) + \left(25,000 \times \frac{100-80}{100}\right)$
 = 20,000 + 5,000 = 25,000
 Required percentage = $\frac{12,000}{25,000} \times 100 = 48\%$
- 43. (a):** Cycles sold by companies – A & D together in 2017 = $\left(35,000 \times \frac{80}{100}\right) + \left(45,000 \times \frac{60}{100}\right)$
 = 28,000 + 27,000 = 55,000
 Cycles sold by companies – B & C together in 2018 = $\left(60,000 \times \frac{95}{100}\right) + \left(30,000 \times \frac{90}{100}\right)$
 = 57,000 + 27,000 = 84,000
 Required difference = 84,000 – 55,000 = 29,000
- 44. (b):** Cycles sold by company – B in 2017 & 2018 together = $\left(50,000 \times \frac{70}{100}\right) + \left(60,000 \times \frac{95}{100}\right)$
 = 35,000 + 57,000 = 92,000
 Cycles sold by companies – A & E together in 2018 = $\left(40,000 \times \frac{85}{100}\right) + \left(25,000 \times \frac{80}{100}\right)$
 = 34,000 + 20,000 = 54,000
 Required ratio = $\frac{92,000}{54,000} = 46:27$
- 45. (b):** Total unsold cycles by companies – A & C together in 2017 = $\left(35,000 \times \frac{100-80}{100}\right) + \left(40,000 \times \frac{100-75}{100}\right)$
 = 7,000 + 10,000 = 17,000
 Total unsold cycles of companies – A, B & C together in 2018 = $\left(40,000 \times \frac{100-85}{100}\right) + \left(60,000 \times \frac{100-95}{100}\right) + \left(30,000 \times \frac{100-90}{100}\right)$
 = 6,000 + 3,000 + 3,000 = 12,000
 Required difference = 17,000 – 12,000 = 5,000

Directions (46-50): Study the line charts given below and answer the following questions.

Line chart shows the total number of watches manufactured by 5 different companies (A, B, C, D & E) in 2018 & 2019 and percentage of unsold watches out of total watches manufactured by these 5 companies in these 2 years. All these 5 companies destroy all the unsold watches in every year.



46. Unsold watches of companies A, B & E together in 2019 are what percent more or less than sold watches of companies B & E together in 2018?
 (a) 50% (b) 30% (c) 20% (d) 40% (e) 60%
47. Average watches sold of company B, C & D in 2018 are how much more or less than unsold watches of company B, D & E together in 2019?
 (a) 2,400 (b) 2,500 (c) 2,800 (d) 2,200 (e) 2,700
48. Watches sold of company B, C & D together in 2019 are what percent of unsold watches of company B, D & E together in 2018?
 (a) 432.5% (b) 407.5% (c) 487.5% (d) 356.5% (e) 378.5%
49. Find ratio of sold watches of company A, B & D together in 2018 to sold watches of company A, B & E together in 2019.
 (a) 6:7 (b) 44:49 (c) 7:8 (d) 15:16 (e) None of the above.
50. Unsold watches of company C in 2018 & 2019 and company A in 2018 together are how much less than average of watches manufactured by company A, B, D & E in 2018?
 (a) 6,900 (b) 5,500 (c) 6,300 (d) 7,600 (e) 5,100

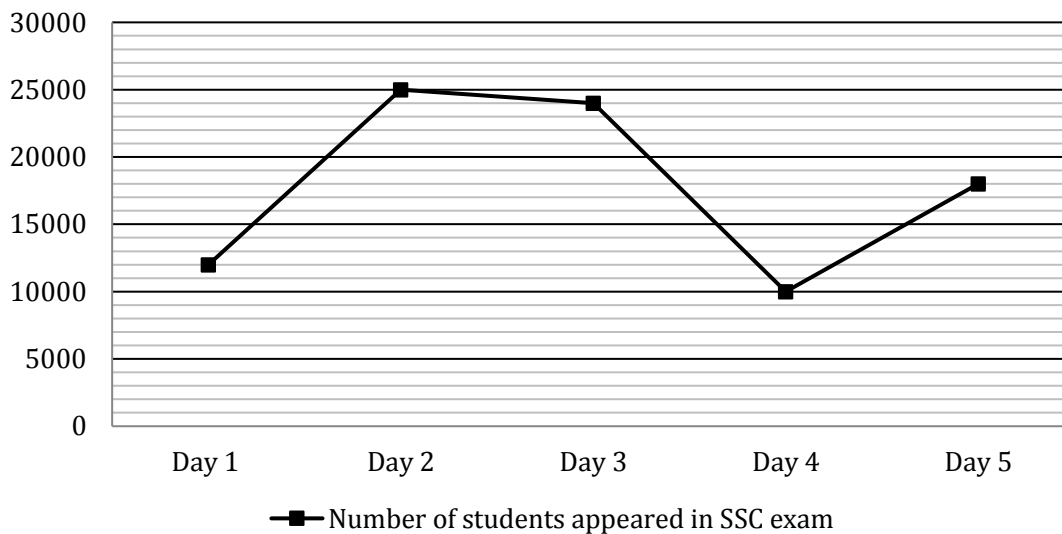
46. (a): Unsold watches of company A, B & E together in 2019 = $\left(6,000 \times \frac{25}{100}\right) + \left(10,000 \times \frac{20}{100}\right) + \left(15,000 \times \frac{20}{100}\right)$
 $= 1,500 + 2,000 + 3,000 = 6,500$
 Sold watches of company B & E together in 2018 = $\left(8,000 \times \frac{100-25}{100}\right) + \left(10,000 \times \frac{100-30}{100}\right)$
 $= 6,000 + 7,000 = 13,000$
 Required % = $\frac{13,000 - 6,500}{13,000} \times 100 = 50\%$

47. (d): Average watches sold of company B, C & D in 2018 = $\frac{1}{3} \times \left(\left(8,000 \times \frac{100-25}{100}\right) + \left(16,000 \times \frac{100-10}{100}\right) + \left(15,000 \times \frac{100-20}{100}\right) \right)$
 $= \frac{1}{3} \times (6,000 + 14,400 + 12,000) = 10,800$
 Unsold watches of company B, D & E together in 2019 = $\left(10,000 \times \frac{20}{100}\right) + \left(12,000 \times \frac{30}{100}\right) + \left(15,000 \times \frac{20}{100}\right)$
 $= 2,000 + 3,600 + 3,000 = 8,600$
 Required difference = $10,800 - 8,600 = 2,200$

- 48. (b):** Watches sold of company B, C & D together in 2019 = $\left(10,000 \times \frac{100-20}{100}\right) + \left(18,000 \times \frac{100-10}{100}\right) + \left(12,000 \times \frac{100-30}{100}\right)$
 $= 8,000 + 16,200 + 8,400 = 32,600$
 Unsold watches of company B, D & E together in 2018 = $\left(8,000 \times \frac{25}{100}\right) + \left(15,000 \times \frac{20}{100}\right) + \left(10,000 \times \frac{30}{100}\right)$
 $= 2,000 + 3,000 + 3,000 = 8,000$
 Required % = $\frac{32,600}{8,000} \times 100 = 407.5\%$
- 49. (b):** Sold watches of company A, B & D together in 2018 = $\left(5,000 \times \frac{100-20}{100}\right) + \left(8,000 \times \frac{100-25}{100}\right) + \left(15,000 \times \frac{100-10}{100}\right)$
 $= 4,000 + 6,000 + 12,000 = 22,000$
 Sold watches of company A, B & E together in 2019 = $\left(6,000 \times \frac{100-25}{100}\right) + \left(10,000 \times \frac{100-20}{100}\right) + \left(15,000 \times \frac{100-20}{100}\right)$
 $= 4,500 + 8,000 + 12,000$
 $= 24,500$
 Required ratio = $\frac{22,000}{24,500} = 44:49$
- 50. (e):** Average of watches manufactured by companies A, B, D & E in 2018 = $\frac{1}{4} \times (5,000 + 8,000 + 15,000 + 10,000)$
 $= \frac{1}{4} \times 38,000 = 9,500$
 Unsold watches of company C in 2018 & 2019 and that of company A in 2018 together = $\left(16,000 \times \frac{10}{100}\right) + \left(18,000 \times \frac{10}{100}\right) + \left(5,000 \times \frac{20}{100}\right)$
 $= 1,600 + 1,800 + 1,000 = 4,400$
 Required difference = $9,500 - 4,400 = 5,100$

Practice MCQs for Prelims

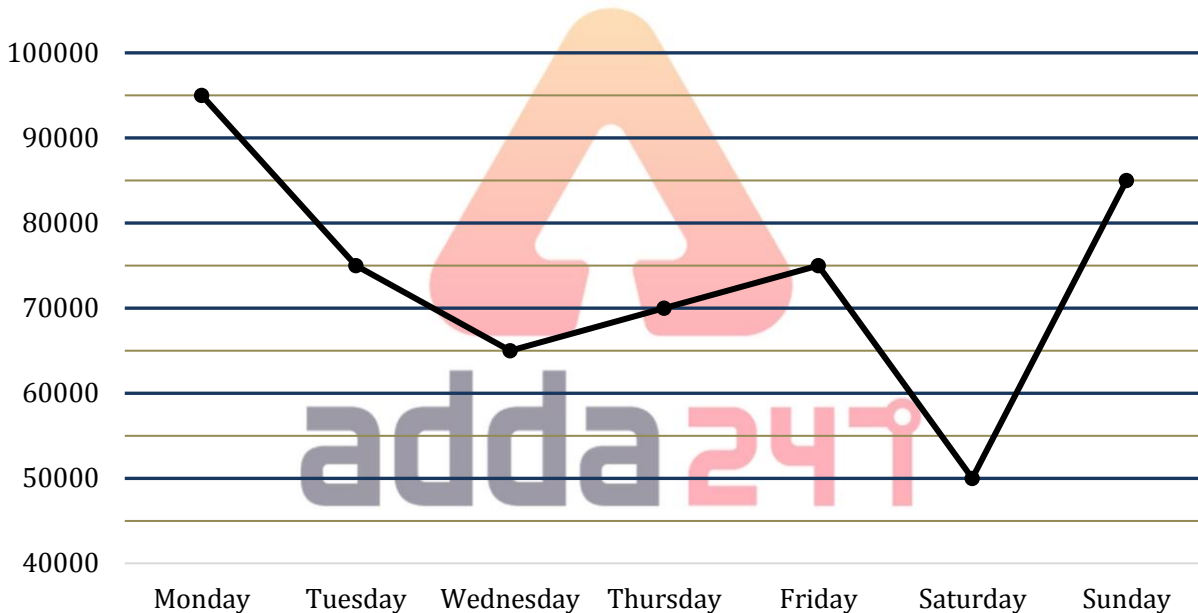
Directions (1-5) Line graph given below gives information about total no. of students appeared in SSC exam held on five different days (Day1, Day2, Day3, Day4 & Day5).



- 1.** If no. of student who appeared on day 1 for SSC exam are 5% of total no. of students who applied for SSC exam, then find no. of students who appeared on day 4 for SSC exam are what percent of total no. of students who applied for SSC exam?
- (a) $4\frac{1}{6}\%$ (b) $4\frac{1}{3}\%$ (c) 2% (d) 3% (e) 4.67%

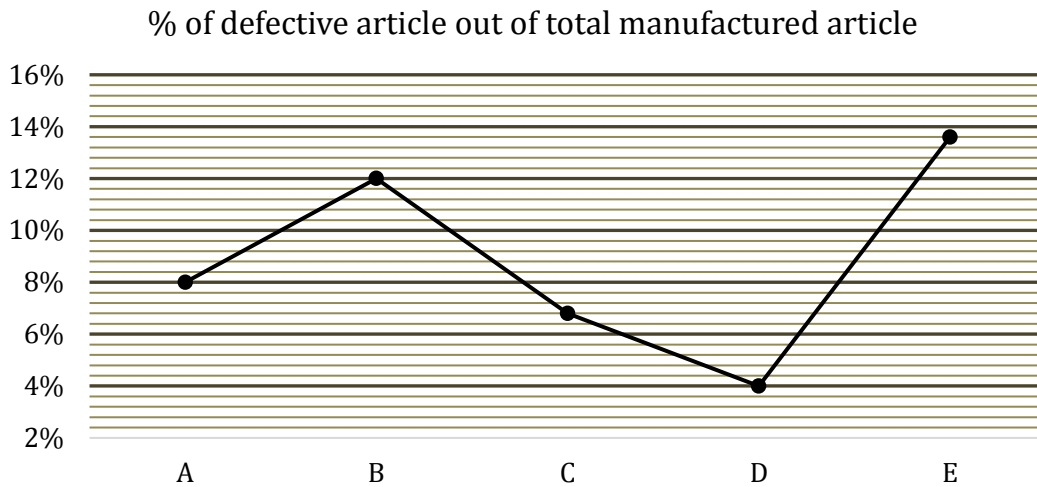
2. If ratio of no. of girls to boys appeared on day 2 and day 3 for SSC exam are 3:2 and 5:3 respectively, find no. of girls appeared on day 3 for SSC exam are how much more/less than no. of boys appeared on day 2 for SSC exam?
 (a) 2000 (b) 2500 (c) 3700 (d) 5000 (e) 2800
3. No. of students appeared on day 1 for SSC exam are what percent more or less than no. of students appeared on day 4 for SSC exam?
 (a) 20% (b) 12.5% (c) 25% (d) 14.28% (e) 7.14%
4. What is the ratio of average no. of student appeared for SSC exam on day1, day2 and day5 to that of on day3 and day4?
 (a) 147:110 (b) 55:49 (c) 49:55 (d) 55:51 (e) None of these.
5. Difference between no. of students appeared for SSC exam on day 1 and day 3 is 12.5% of total no. of students applied for SSC exam. Find total no. of students applied for SSC exam are how much more than no. of students appeared on day 2 for SSC exam?
 (a) 75000 (b) 71000 (c) 81000 (d) 80000 (e) 85000

Directions (6-10):- The line graph shows the no. of passengers who travels from Metro in 7 days of a given week. Study the graph carefully and answer the following question.



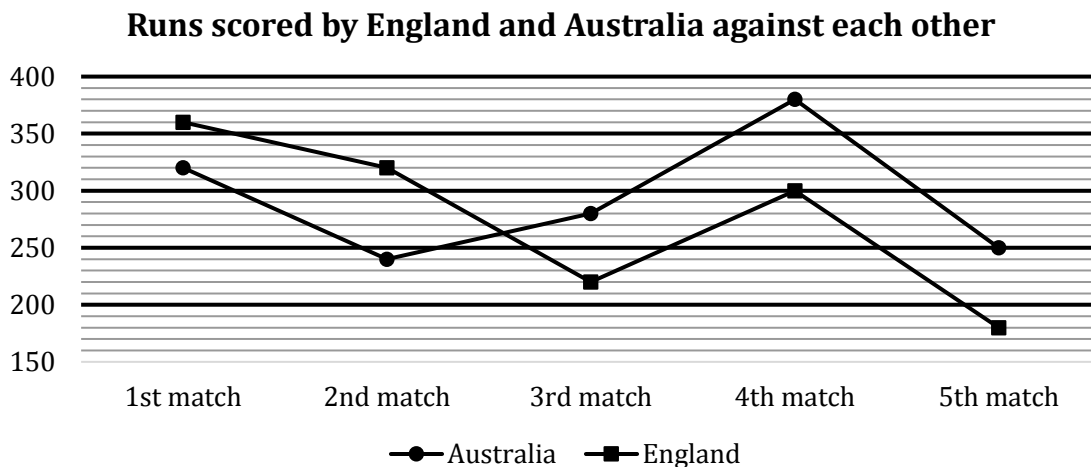
6. What is the average no. of passenger travels from Tuesday to Saturday?
 (a) 64000 (b) 67000 (c) 72000 (d) 70000 (e) 75000
7. Passenger who travels on Thursday are what percentage of passengers who travels on Saturday?
 (a) 120% (b) 71.4% (c) 140% (d) 87.5% (e) 175%
8. Find the ratio of no. of passenger travels on Monday and Thursday together to Tuesday and Sunday together.
 (a) 33 : 32 (b) 33 : 34 (c) 17 : 16 (d) 1 : 1 (e) 3 : 2
9. Passengers travels on Tuesday are what percentage more/less than that on Wednesday?
 (a) $13\frac{1}{13}\%$ (b) $16\frac{2}{3}\%$ (c) $14\frac{8}{13}\%$ (d) $15\frac{5}{13}\%$ (e) $12\frac{4}{13}\%$
10. Passenger travels on Wednesday and Friday together are how much more or less than that on Sunday and Monday together?
 (a) 30000 (b) 50000 (c) 35000 (d) 40000 (e) 45000

Direction (11-15): - Line graph given below shows percentage of defective article out of total manufactured article in five different company i.e. (A, B, C, D and E).



11. If ratio between total no. of article manufactured in company C to company E is 1:2. Find ratio of defective article manufactured in E to that of C?
 (a) 2:1 (b) 4:1 (c) 8:3 (d) 4:3 (e) 3:2
12. If no. of article manufactured in each company are equal, find no. of non-defective article manufactured in company D are how much percent more/less than no. of non-defective article manufactured in company B?
 (a) $11\frac{1}{9}\%$ (b) $9\frac{1}{11}\%$ (c) $14\frac{2}{7}\%$ (d) $7\frac{1}{7}\%$ (e) $37\frac{1}{5}\%$
13. No. of defective article manufactured by company A is 96. Find total no. of article manufactured by company A?
 (a) 9600 (b) 1200 (c) 1600 (d) 8000 (e) 3200
14. If ratio of defective article of company C to that of D is 2:3. Find ratio between total no. of article manufactured by company C to that of company D?
 (a) 20:7 (b) 3:7 (c) 20:51 (d) 25:21 (e) Can't be determine.
15. If difference between no. of article manufactured by company A and D is 200 and ratio of no. of article manufactured by A to D is 7:6. Find no. of non-defective article manufactured by A?
 (a) 1288 (b) 1308 (c) 1402 (d) 1512 (e) 1198

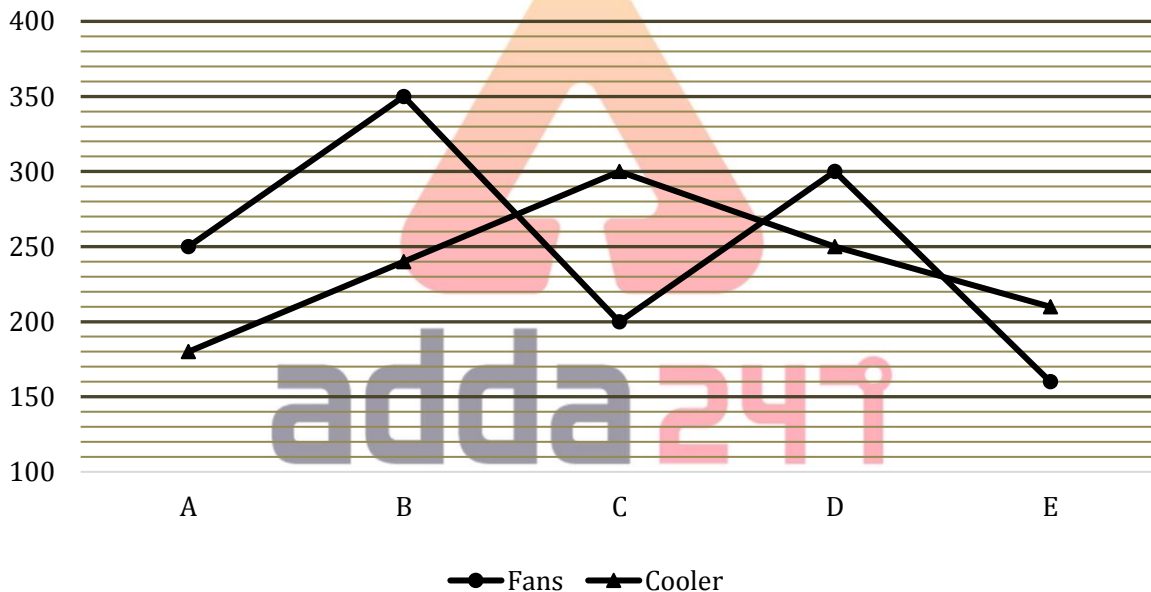
Directions (16-21): - Study the line graph carefully and answer the following questions.
 The line graph shows the runs scored by two different teams in a series of 5 cricket matches.



16. Runs scored by Australia in first and third match together is what percent of runs scored by England in second and fifth match together?
 (a) 100% (b) 125% (c) $83\frac{1}{3}\%$ (d) 120% (e) 75%
17. Find the difference between maximum runs scored by England and minimum runs scored by Australia.
 (a) 120 runs (b) 80 runs (c) 150 runs (d) 200 runs (e) 180 runs
18. What is the ratio between total runs scored by Australia to that of England in all matches?
 (a) 25 : 23 (b) 46 : 47 (c) 43 : 46 (d) 49 : 46 (e) 23 : 43
19. Runs scored by Australia in second match is what percent more or less than runs scored by England in fourth match?
 (a) 25% (b) 20% (c) 35% (d) 10% (e) 50%
20. Australia won how many matches out of all the five matches?
 (a) 1 (b) 4 (c) 3 (d) 5 (e) 2
21. What are the average runs scored by England in first four matches?
 (a) 250 (b) 280 (c) 345 (d) 320 (e) 300

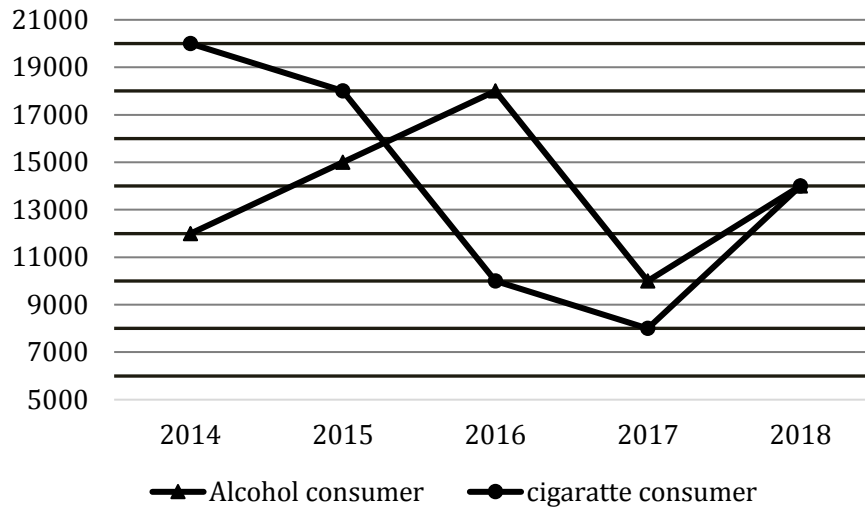
Directions (22-26) :- Study the given line graph and answer the following questions.

The given line graph shows the no. of units of fans and cooler sold by 5 different stores.



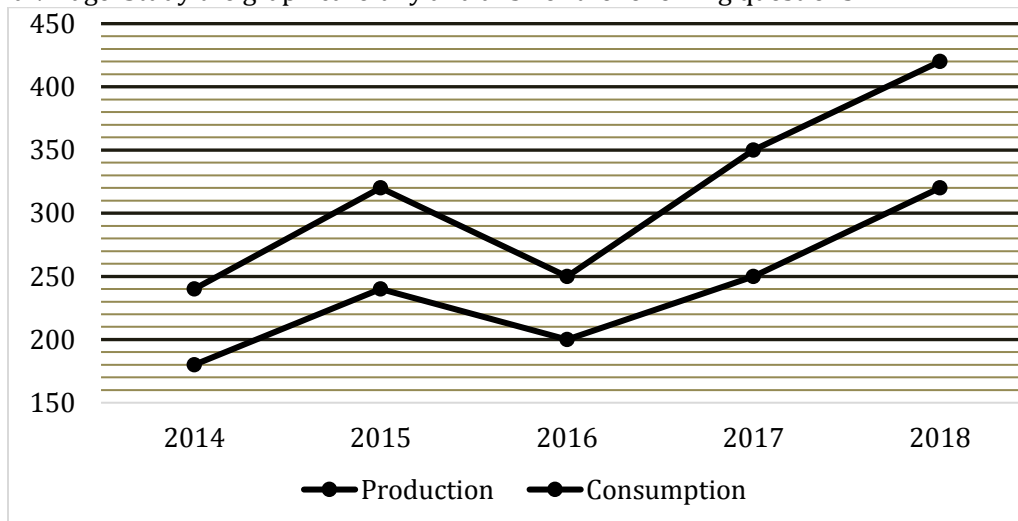
22. No. of units of cooler sold by store A and C together is what percent of that of B, D and E together? (approximately)
 (a) 65% (b) 75% (c) 69% (d) 60% (e) 80%
23. What is the average no. of coolers sold by all the stores?
 (a) 252 (b) 244 (c) 246 (d) 236 (e) 263
24. Find the ratio between no. of fans sold by A and C together to no. of cooler sold by B and C together.
 (a) 5 : 9 (b) 6 : 5 (c) 11 : 9 (d) 5 : 6 (e) 6 : 7
25. If 20% of the total sold fans of store B are defective and 75% of the total sold fans of store D are non-defective, then finds the non-defective sold fans of store B are how much more/less than that of store D?
 (a) 55 (b) 30 (c) 5 (d) 65 (e) 45
26. If per unit selling price of fan and cooler is Rs 350 and Rs 800 respectively for every store. Find total revenue of store C is how much more/less than that of store D.
 (a) Rs 4000 (b) Rs 5500 (c) Rs 4500 (d) Rs 6500 (e) Rs 5000

Directions (27-31) :- The line graph shows the no. of consumers of alcohol and cigarettes in a state in 5 different years. Study the graph carefully and answer the following questions.



27. Find the ratio between alcohol consumers in 2014 and 2016 together to the cigarette consumers in 2016 and 2017 together.
 (a) 5 : 6 (b) 5 : 3 (c) 10 : 9 (d) 5 : 4 (e) 7 : 6
28. Find the no. of alcohol consumers increased or decreased in 2018 over 2014.
 (a) 4000 (b) 3000 (c) 2000 (d) 5000 (e) 6000
29. What is the average no. of cigarette consumers over all the years?
 (a) 12000 (b) 15000 (c) 13000 (d) 14000 (e) 16000
30. Cigarette consumers is what percent of alcohol consumers in 2015?
 (a) 120% (b) 83.33% (c) 125% (d) 150% (e) 78%
31. Alcohol consumers in 2015 and 2017 together is what percent more/less than cigarette consumers in 2014 and 2016 together?
 (a) 16.67% (b) 23.25% (c) 17.25% (d) 20% (e) 12.5%

Direction (32-35): The line graph given below shows the production and consumption (in quintal) of Wheat in a 5 different years of a village. Study the graph carefully and answer the following questions.



32. What is the average consumption of Wheat all over the years?
 (a) 245 Quintals (b) 254 Quintals (c) 316 Quintals (d) 238 Quintals (e) 278 Quintals
33. Production of wheat in 2015 is what percentage more/less than that in 2016?
 (a) 28% (b) 33% (c) 30% (d) 25% (e) 23%
34. What is the ratio between the consumption of wheat in 2016 and 2017 together to the production of wheat in 2014 and 2015 together?
 (a) 45 : 53 (b) 45 : 56 (c) 12 : 17 (d) 15 : 17 (e) 30 : 53
35. If in 2019 the ratio between the production and consumption of wheat is 7 : 5 and total production of wheat is 280 Quintal, then consumption of wheat in 2019 is how much more/less than previous year?
 (a) 150 quintals (b) 180 quintals (c) 140 quintals (d) 120 quintals (e) 220 quintals

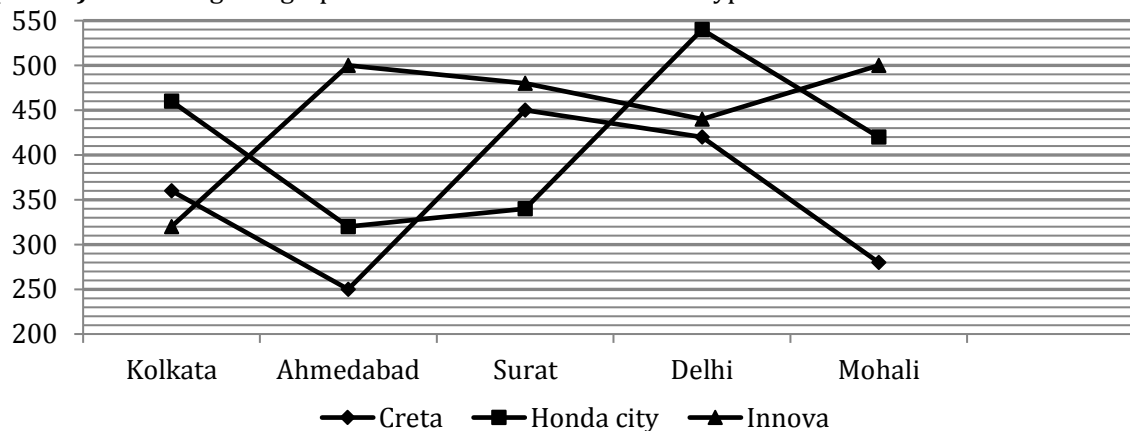
Directions (36-39): Study the line graph given below and answer the following questions.

Line graph shows the number of pens sold by 4 different shopkeepers (A, B, C & D) in 2015 and 2016.



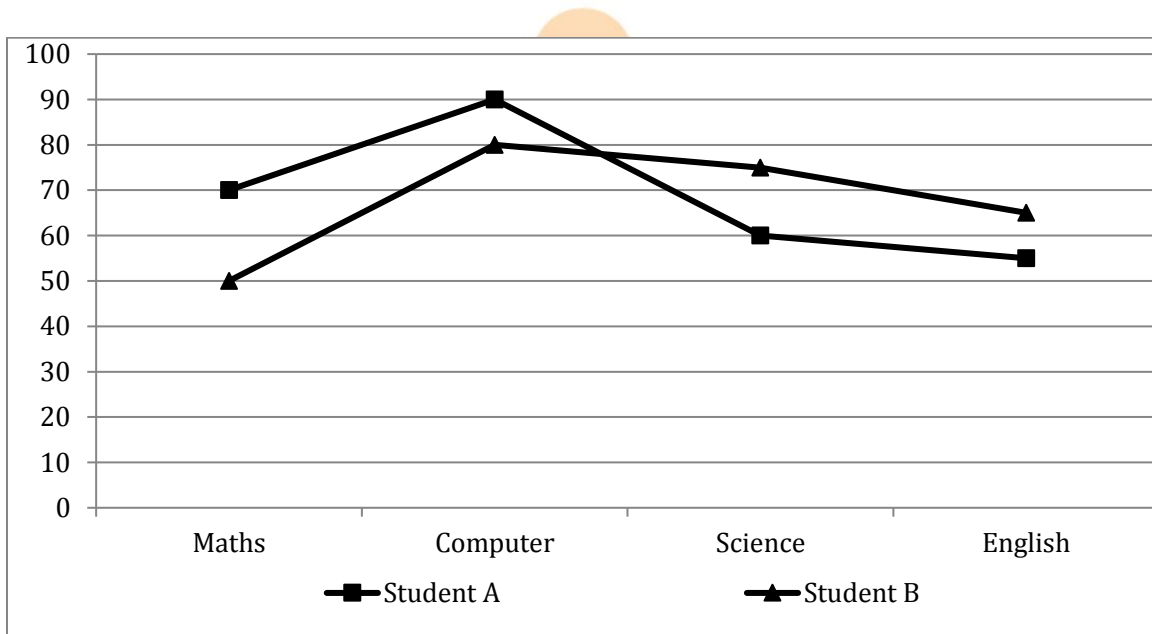
36. Find average number of pens sold by C & D in both the years.
 (a) 354 (b) 344 (c) 352 (d) 342 (e) 337
37. Find ratio of pens sold by B & C together in 2015 to pens sold by B & C together in 2016.
 (a) 1 : 1 (b) 2 : 3 (c) 8 : 9 (d) 5 : 6 (e) 5 : 4
38. Number of pens sold by A & C together in 2016 are what percent more than those sold by B in 2015?
 (a) $116\frac{2}{3}\%$ (b) 110% (c) 125% (d) 112.5% (e) 120%
39. Number of pens sold by A, C & D together in 2015 are how much more or less than pens sold by these shopkeepers together in 2016?
 (a) 4 (b) 6 (c) 8 (d) 12 (e) 9

Directions (40-44):- following line graph shows the data of 3 different types of cars sold in 5 different cities.



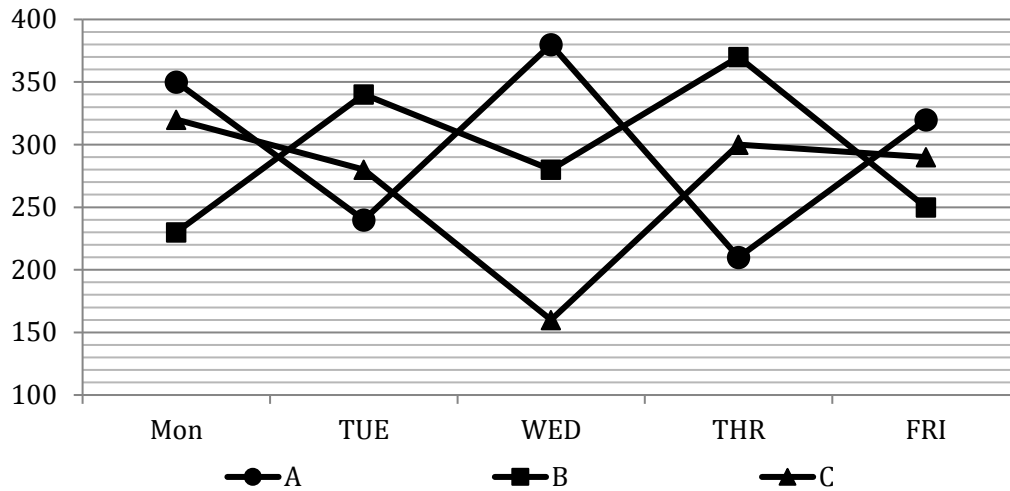
- 40.** Number of Honda city car sold in Ahmedabad is what percent of total Innova car sold in Surat?
 (a) 50% (b) $66\frac{2}{3}\%$ (c) 70 % (d) $57\frac{1}{7}\%$ (e) 80 %
- 41.** Find the respective ratio of Creta car sold in Delhi and Mohali together to the total of Innova car sold in Kolkata and Ahmedabad together?
 (a) 41:35 (b) 46:53 (c) 26:35 (d) 35:41 (e) 35:54
- 42.** Find the total number of cars sold in Kolkata?
 (a) 1140 (b) 1170 (c) 1250 (d) 1300 (e) 1080
- 43.** Find the difference between number of Honda city cars sold in delhi and number of creta cars sold in surat?
 (a) 70 (b) 110 (c) 80 (d) 100 (e) 90
- 44.** Find the average number of Honda city car sold in all the cities?
 (a) 420 (b) 426 (c) 416 (d) 430 (e) 435

Direction (45-49): Following Line Graph shows the marks scored by Student A and Student B in high school in different Subjects. (Maximum Marks is 100 for each subject). Study the data carefully and answer the following questions.



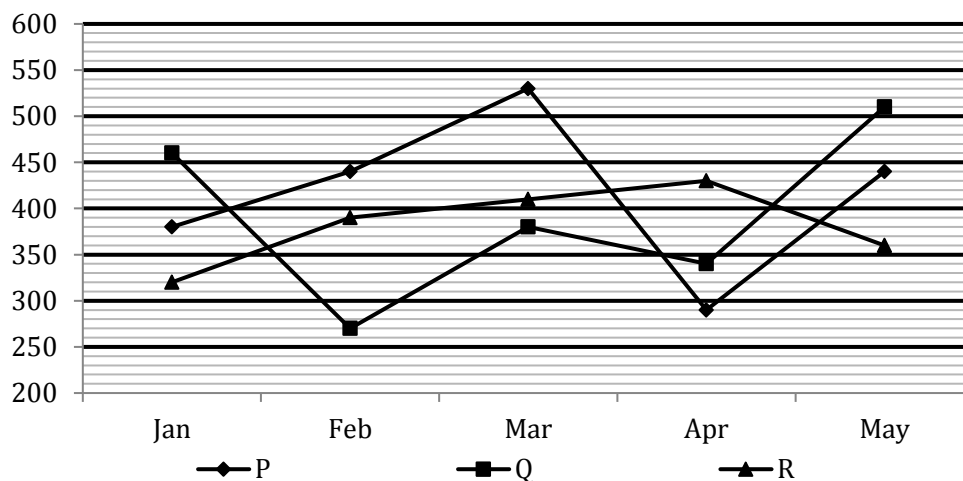
- 45.** What is difference between average marks scored by Student A and Student B in all subjects?
 (a) 1.75 (b) 1.45 (c) 1.50 (d) 1.25 (e) 1
- 46.** What is Ratio of marks obtained by Student A in Maths and Computer together to the marks obtained by Student B in Science and English together?
 (a) 7:5 (b) 7:8 (c) 8:7 (d) 8:5 (e) 5:7
- 47.** What is the overall percentage marks scored by Student B?
 (a) 68.75 % (b) 67.5 % (c) 68% (d) 67% (e) 69.25%
- 48.** Marks Scored by Student A in Math is what percent of marks scored by Student B in Science and English together?
 (a) 40% (b) 60% (c) 50% (d) 70% (e) 80%
- 49.** If passing marks for each subject is 40% of 120, then what is the difference between passing marks and marks scored by Student B in Computer?
 (a) 30 (b) 32 (c) 36 (d) 40 (e) 45

Directions (50-54):- Given line graph shows the number of mangoes sold by three different sellers A, B and C on five different days. Read the line graph carefully and answer the questions accordingly.



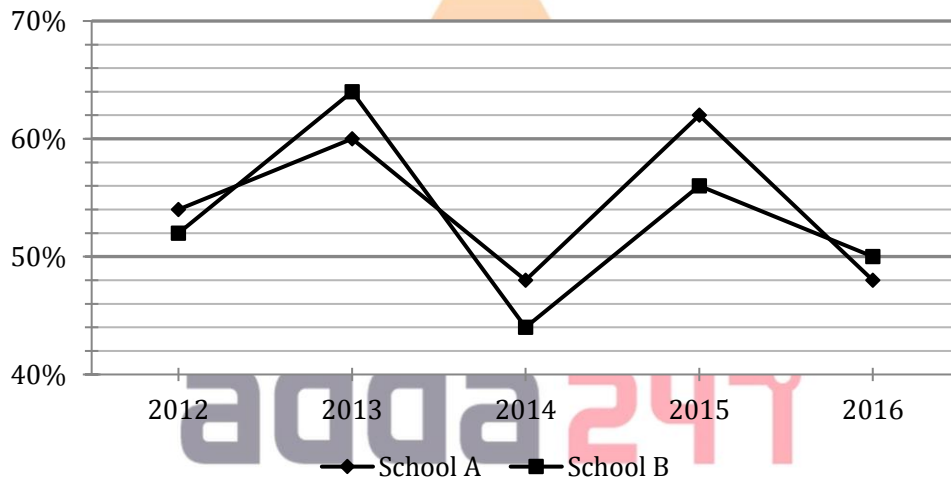
50. Find the difference between average number of mangoes sold by A on all the five days together and average no. of mangoes sold by seller C on all the five days together?
 (a) 20 (b) 50 (c) 40 (d) 30 (e) 45
51. Find the respective ratio of mangoes sold by A and B on Monday and Tuesday together to the mangoes sold by B and C sold on Wednesday and Friday together?
 (a) 55:47 (b) 58:49 (c) 47:55 (d) 49:58 (e) 47:57
52. Total number of mangoes sold by seller B and C together on Friday is what percentage of mangoes sold by seller A, B and C together on Monday?
 (a) 70% (b) 65% (c) 60% (d) 55% (e) 75%
53. Find the average number of mangoes sold by seller B on all the days together?
 (a) 294 (b) 300 (c) 325 (d) 280 (e) 275
54. Total Mangoes sold by seller B and C together on Monday is how much more/less than total mangoes sold by seller B and C together on Thursday?
 (a) 140 (b) 100 (c) 120 (d) 110 (e) 150

Directions (55-59):- Given line graph shows the details of number of cars sold by three different Showrooms P, Q and R in five different months and answer the questions accordingly.



55. Total cars sold by showroom Q in February and March together is what percent of cars sold by showroom R in February and March together?
 (a) 72.5% (b) 76.25% (c) 81.25% (d) 84.75% (e) 77.5%
56. Find the difference between average numbers of cars sold by the showroom P in all months together to the average number of cars sold by the showroom Q in all the months together?
 (a) 38 (b) 32 (c) 34 (d) 28 (e) 24
57. Find the average number of cars sold by all the 3 showrooms in March month?
 (a) 460 (b) 440 (c) 480 (d) 420 (e) 490
58. Find the respective ratio of total numbers of cars sold by showroom P in March, April and May together to the total number of cars sold by showroom R in January, February and March together?
 (a) 7 : 8 (b) 8 : 9 (c) 8 : 7 (d) 9 : 8 (e) 9 : 7
59. If in June, numbers of cars sold by showrooms P, Q and R is 20% , 25% and 30% respectively more than that of cars sold in march by all the respective showrooms, then find total cars sold by all the 3 showrooms together in June ?
 (a) 1644 (b) 1686 (c) 1584 (d) 1728 (e) 1782

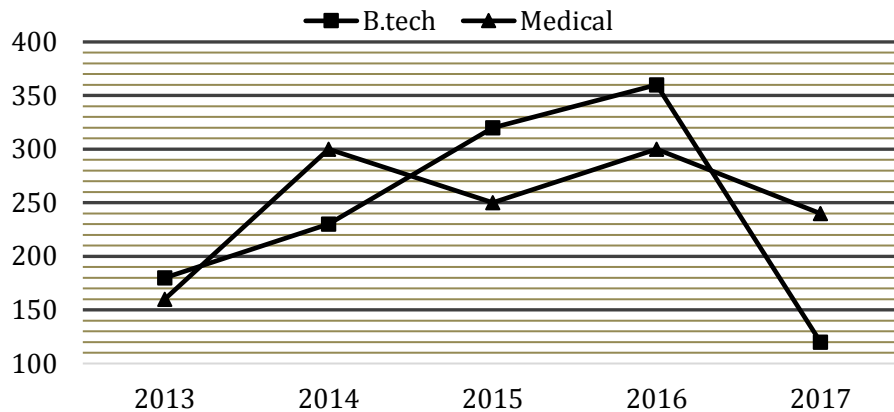
Directions (60-64): Given below is the line graph which shows the percentage of boys in two school A and B in 5 different years.



Total students in any school = Total boys + Total girls in each school

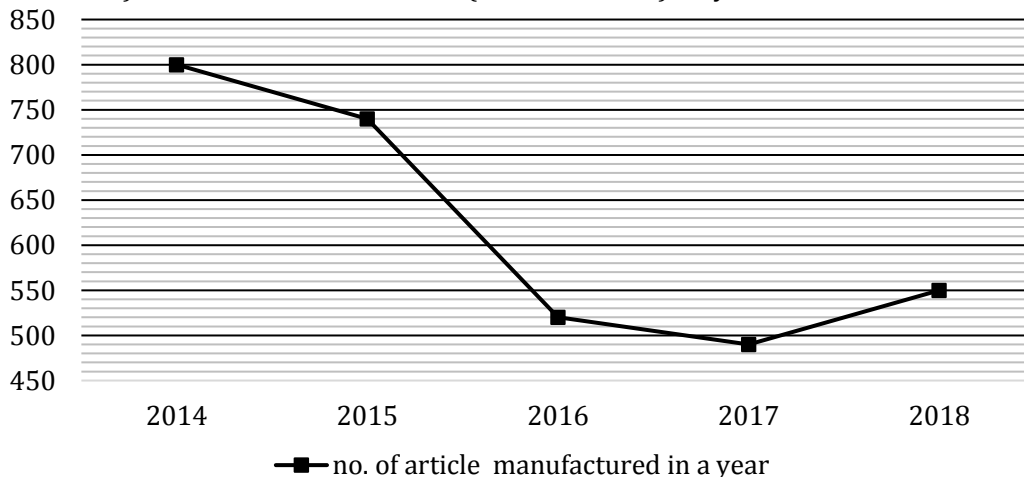
60. In 2012, ratio of boys in school A to school B is 45 : 52 and total students in both school in 2012 is 1100. Find the total number of girls in both school in same year.
 (a) 568 (b) 528 (c) 518 (d) 418 (e) 488
61. If in 2014, boys in school A and B are 288 and 264 respectively then, find total number of girls in both school in 2014.
 (a) 594 (b) 640 (c) 564 (d) 648 (e) 630
62. If boys in school A in 2014 and girls in school B in 2012 are equal then boys in school B in 2012 are what percent of girls in school A in 2014.
 (a) 85% (b) 95% (c) 90% (d) 80% (e) 100%
63. In 2016, girls in school A are $16\frac{4}{5}\%$ less than girls in school B. Find the ratio of boys in school A to that of school B in 2016.
 (a) 100 : 123 (b) 98 : 117 (c) 98 : 125 (d) 92 : 117 (e) 96 : 125
64. If total students in school A in 2015 and total student in B in 2013 are 700 and 400 respectively, then find the average number of boys in school A in 2015 and boys in school B in 2013.
 (a) 344 (b) 345 (c) 348 (d) 368 (e) 358

Direction (65-69): The following line graph shows the number of students enrolled in two different courses (B.Tech, & Medical) in a college during 2013 to 2017. Study the given graph carefully and answer the following questions.



65. What was the percent increase/decrease in number of students in medical in the year 2017 as compared to previous year?
 (a) 12.5% (b) 25% (c) 20% (d) 22.5 (e) 33.33%
66. Number of students enrolled in B.Tech in the year 2014 and 2015 together was what percent of the total number of students enrolled in Medical in the year 2015?
 (a) $\frac{500}{11}\%$ (b) 120% (c) 150% (d) 220% (e) 70%
67. Find the average no. of students enrolled in B.Tech all over the years.
 (a) 242 (b) 422 (c) 264 (d) 342 (e) 282
68. What is the ratio between students enrolled in B.Tech in year 2014 and 2016 together to that of Medical in year 2017 and 2016 together?
 (a) 54 : 59 (b) 9 : 10 (c) 55 : 58 (d) 59 : 54 (e) 57 : 59
69. Total number of students enrolled in year 2016 is how much percentage more or less than total no. of students enrolled in year 2017? (total students = medical + B-tech)
 (a) $83\frac{1}{3}\%$ (b) $85\frac{1}{3}\%$ (c) $87\frac{2}{3}\%$ (d) 90% (e) $93\frac{1}{3}\%$

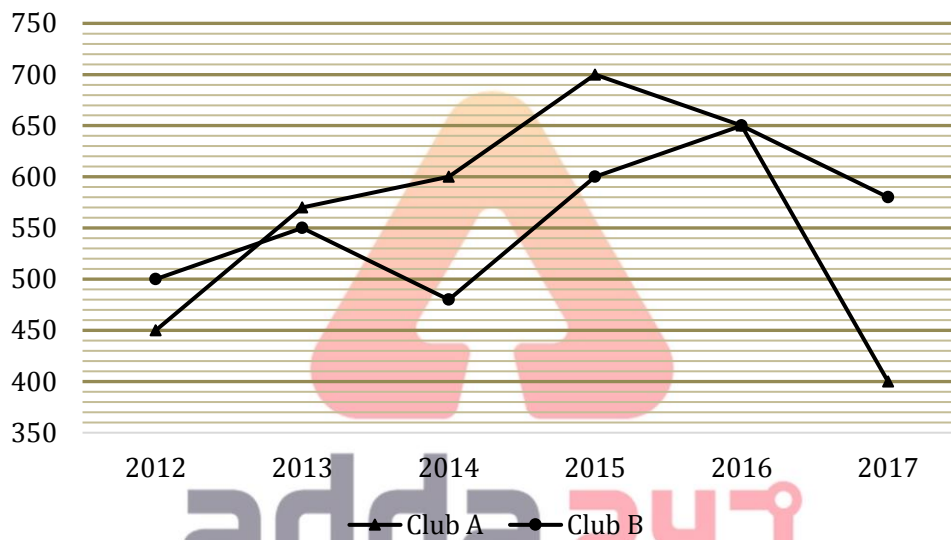
Directions (70-74) – Line chart given below gives information about no. of article manufactured every year. Total no. of article for selling in a year are sum of article unsold in previous year and no. of articles manufactured in that year. In each year (2014, 2015 and 2018) 80% of article were sold in (2016 and 2017) only 70% article were sold.



Note – Company starts manufacturing articles from 2014.

70. No. of article sold in year 2015 are how much more than no. of article sold in 2014?
 (a) 80 (b) 70 (c) 90 (d) 84 (e) 64
71. In which year no. of article sold are equal to no. of article sold in year 2016?
 (a) 2014 (b) 2015 (c) 2017 (d) 2018 (e) None of these.
72. No. of article manufactured in year 2017 are what percent of no. of article sold in same year?
 (a) 50% (b) 100% (c) 75% (d) 150% (e) 80%
73. What is the sum of no. of article manufactured in year 2016 & 2018?
 (a) 1250 (b) 1070 (c) 1190 (d) 1110 (e) 1020
74. What is the ratio of no. of article sold in 2015 to no. of article available for selling in year 2018?
 (a) 11:12 (b) 18:19 (c) 17:19 (d) 17:21 (e) None of these.

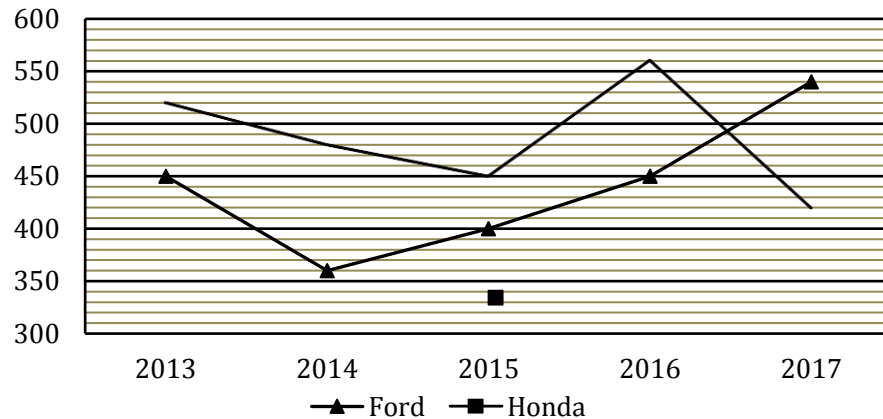
Direction (75-79): The given line chart shows the number of members enrolled into membership of two clubs A and B in different years from 2012 to 2017. Study the line chart carefully and answer the following questions.



75. Find the difference between average members enrolled into club B all over the years and members enrolled in club A in year 2013.
 (a) 30 (b) 20 (c) 10 (d) 40 (e) 60
76. Members enrolled into club B in year 2012 and 2015 together is what percent of members enrolled into club A in year 2014 and 2017 together?
 (a) 110% (b) 125% (c) 90.9% (d) 87.5% (e) 75%
77. Find the ratio between number of members enrolled into club A during 2012 to 2014 and number of members enrolled in club B during 2012 to 2014.
 (a) 17:18 (b) 54:53 (c) 19:17 (d) 18:17 (e) 13:18
78. If the membership fee of club A is Rs 1200 for a member and of club B is Rs 1500 for a member, then revenue of club A is how much more/less than that of club B all over the year?
 (a) Rs 9,69,000 (b) Rs 9,96,000 (c) Rs 9,06,000 (d) Rs 8,69,000 (e) Rs 9,60,000
79. If in 2018, number of members enrolled into club A is increased by $7\frac{9}{13}\%$ with respect to year 2016 and number of members enrolled into club B is increased by $8\frac{1}{3}\%$ with respect to year 2014, then find the sum of total members enrolled in year 2018.
 (a) 1320 (b) 1230 (c) 1120 (d) 1410 (e) 1220

Directions (80-84): The following line graph shows the production of cars (in '00) of two companies Ford and Honda from year 2013 to 2017.

Read the graph carefully and answer the following questions.

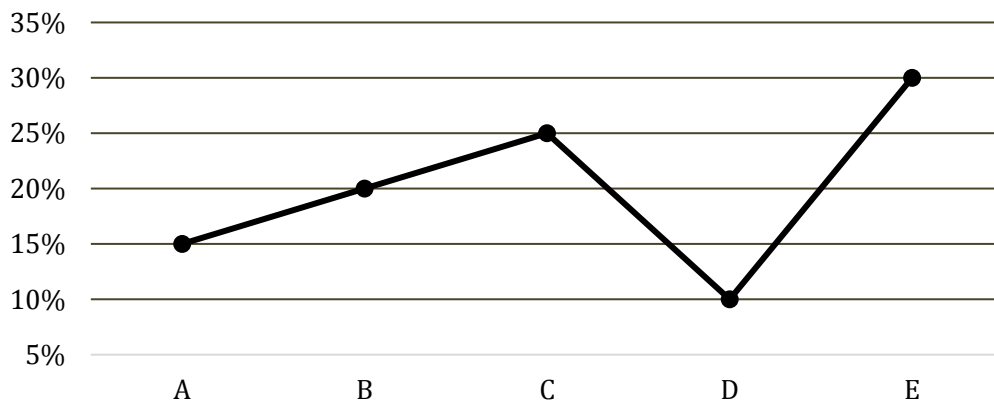


- 80.** Find the ratio between the total productions of Ford cars during 2013-2015 to that of Honda during 2015-2017.
 (a) $\frac{13}{11}$ (b) $\frac{10}{13}$ (c) $\frac{9}{11}$ (d) $\frac{11}{13}$ (e) $\frac{11}{14}$
- 81.** Find the difference between average of production of Ford cars in all over the years and average of production of Honda cars from year 2013-2016.
 (a) 3215 (b) 6520 (c) 3125 (d) 6250 (e) 5260
- 82.** The total production of Honda cars in 2013 and 2015 together is how much percent (approximate) more/less than the total production of Ford cars in 2014 and 2016 together?
 (a) 20% (b) 30% (c) 23% (d) 28% (e) 18%
- 83.** If in year 2013, the production of Ford cars is 12.5% more than previous year and production of Honda cars is 20% less than previous year. What is the total production of cars in year 2012?
 (a) 115000 (b) 105000 (c) 95000 (d) 102000 (e) 120000
- 84.** The ratio of sold cars of Honda in year 2015 to that of Ford cars in year 2017 is 9 : 10. If only 70% of Honda cars in year 2015 are sold, then how many Ford cars in year 2017 are unsold?
 (a) 17000 (b) 35000 (c) 31500 (d) 21500 (e) 19000

Directions (85-89): The given line graph shows the percentage distribution of students in 5 universities viz. A, B, C, D and E of a city.

Study the graph carefully and answer the following questions,

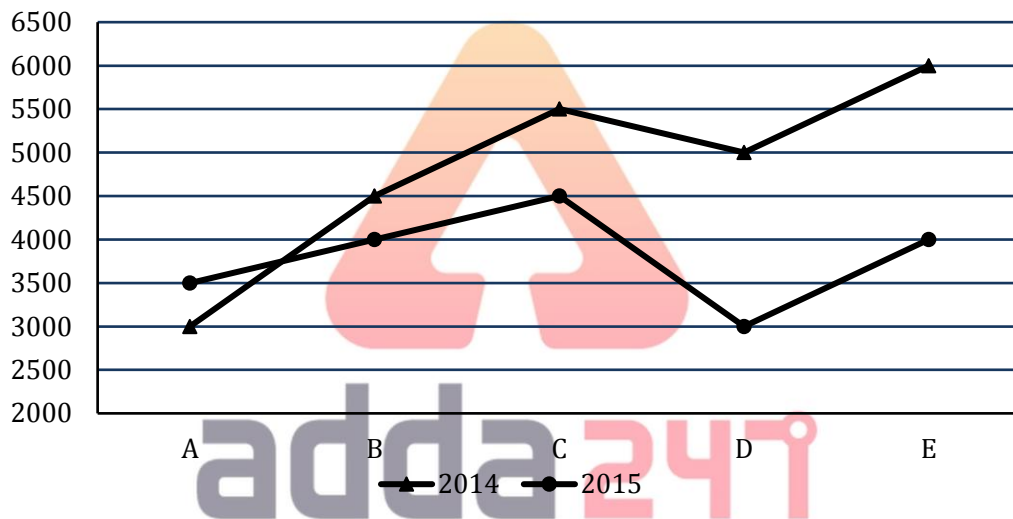
Total number of students = 56000



- 85.** What is the average no. of students in universities of A, B, C and D.
 (a) 13066 (b) 8600 (c) 9800 (d) 9600 (e) 7840
- 86.** Find the difference between number of students of universities A and C together and B and D together.
 (a) 6200 (b) 2800 (c) 8400 (d) 5600 (e) 11200
- 87.** If the ratio between number of boys and girls in universities A and E is 7 : 8 and 5 : 7 respectively, then find the no. of girls in E is how much percentage more/less than no. of boys in A.
 (a) 120% (b) 60% (c) 90% (d) 150% (e) 160%
- 88.** In which university no. of students is equal to average no. of students of all universities?
 (a) A (b) C (c) E (d) B (e) D
- 89.** If in university X, number of students are 14100, then find the ratio between no. of students of X and E.
 (a) $\frac{55}{48}$ (b) $\frac{47}{56}$ (c) $\frac{56}{43}$ (d) $\frac{56}{47}$ (e) $\frac{43}{49}$

Directions (90-94): The given bar show shows the no. of Laptops sold by five companies (A, B, C, D and E) in two different years.

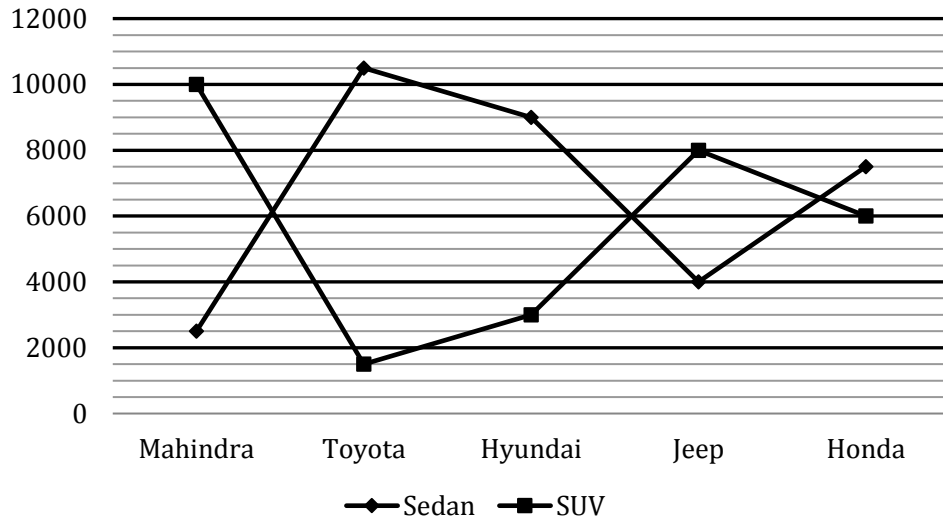
Study the given graph carefully and answer the following questions.



- 90.** Find the average number of laptops sold in year 2014 by all the five companies?
 (a) 4800 (b) 5200 (c) 5500 (d) 5600 (e) 5800
- 91.** Laptops sold by company A in 2014 and B in 2015 together in what percent of laptops sold by company D and E together in 2015?
 (a) 0% (b) 50% (c) 75% (d) 100% (e) 125%
- 92.** What is the ratio between the laptops sold by company A, C and D in 2014 to that of company B and D in 2015?
 (a) $\frac{23}{14}$ (b) $\frac{27}{14}$ (c) $\frac{2}{1}$ (d) $\frac{29}{14}$ (e) $\frac{14}{27}$
- 93.** Laptops sold by C and D together in 2014 is what percentage more than laptops sold by A and B in 2015?
 (a) $44\frac{1}{3}\%$ (b) $41\frac{2}{3}\%$ (c) 40% (d) $47\frac{1}{3}\%$ (e) $46\frac{1}{3}\%$
- 94.** Total laptops sold in year 2014 is how much more/less than total laptops sold in year 2015?
 (a) 2000 (b) 4000 (c) 6000 (d) 3000 (e) 5000

Directions (95-99): Study the line chart given below carefully and answer the following questions.

Line chart shows the number of sedans and SUVs manufactured by five different companies (Mahindra, Toyota, Hyundai, Jeep and Honda) in 2018.

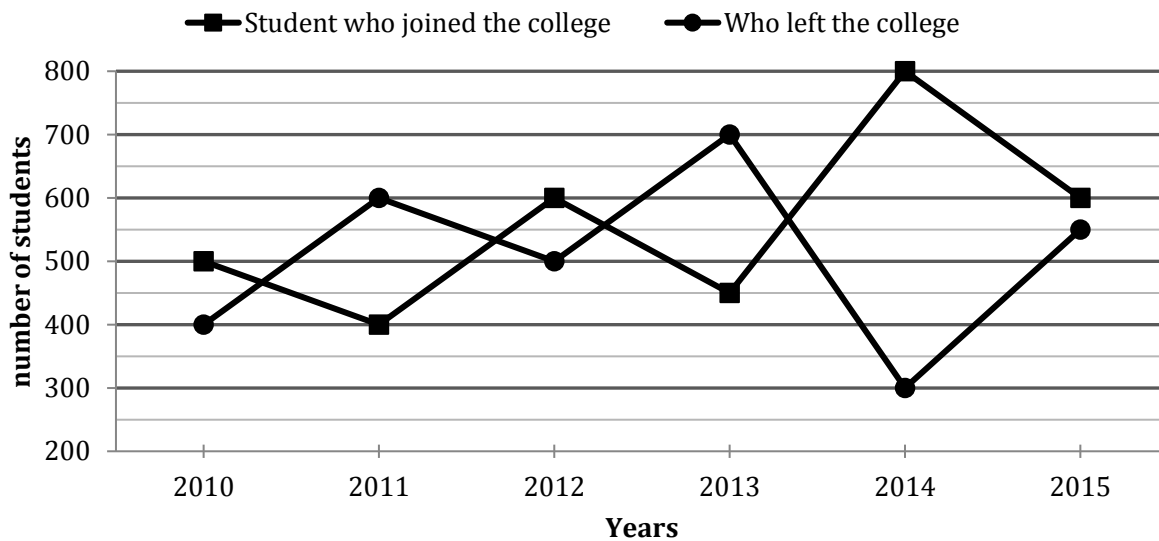


Note – Total cars manufactured by any company = Total (sedans + SUVs) manufactured by that company.

95. Sedans manufactured by Mahindra and Honda together are what percent of total cars manufactured by Mahindra?
 (a) 110% (b) 100% (c) 120% (d) 90% (e) 80%
96. If Hyundai sold 90% of the cars manufactured by it and ratio of sedans sold by Hyundai to SUVs sold by Hyundai is 20 : 7, then find unsold SUVs of Hyundai are what percent of unsold sedans of Hyundai?
 (a) 28% (b) 20% (c) 44% (d) 35% (e) 39%
97. If revenue of Toyota and Hyundai from sales of SUVs is Rs.150 crores and Rs.180 crores, then find difference between selling price of each SUVs of Toyota and Hyundai. (Consider both companies sold all SUVs manufactured by them).
 (a) 0.08 crores (b) 0.05 crores (c) 0.03 crores (d) 0.04 crores (e) None of the above.
98. For how many companies, sedans sold by them are more than average number of sedans sold by all 5 companies?
 (a) 1 (b) 2 (c) 3 (d) 4 (e) 5
99. Find ratio of SUVs sold by Jeep and Honda together to sedans sold by Toyota and Honda together.
 (a) 3 : 4 (b) 7 : 9 (c) 11 : 15 (d) 5 : 8 (e) 1 : 2

Directions (100-104): Study the following line graph which shows the number of students who joined and left the college in the beginning of year for six consecutive years from 2010 to 2015.

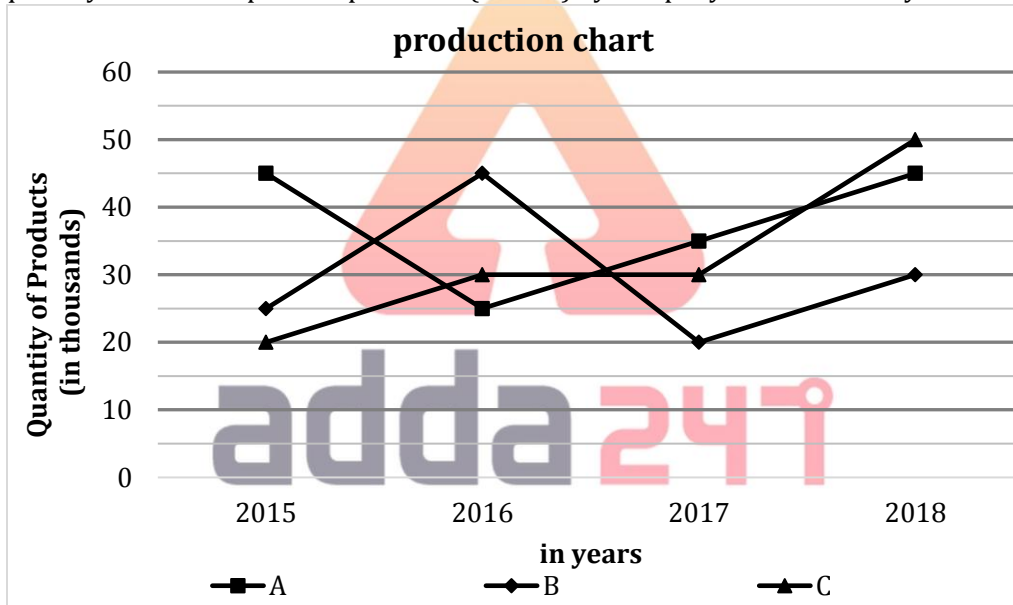
Initial strength of college in 2009 = 5000



- 100.** The number of students who joined the college in year 2013 and 2014 together is what percent more or less than the total number of students who left the college in year 2012 and 2013 together.
 (a) $5\frac{1}{6}\%$ (b) $4\frac{1}{6}\%$ (c) $5\frac{1}{2}\%$ (d) 5% (e) 4%
- 101.** For which year, the percentage rise/fall in the number of students who left the college compared to the previous year is maximum?
 (a) 2011 (b) 2012 (c) 2013 (d) 2014 (e) 2015
- 102.** Find the average of all the students who joined the college in all the given six years.
 (a) $558\frac{1}{3}$ (b) 580 (c) $578\frac{2}{3}$ (d) $578\frac{1}{6}$ (e) $558\frac{1}{6}$
- 103.** Find the percentage increase/decrease in the number of students studying in college from year 2012 to 2013.
 (a) 4% (b) $4\frac{1}{2}\%$ (c) 5% (d) $5\frac{1}{2}\%$ (e) 6%
- 104.** Find the difference between the total number of students who have joined the college for six years and the number of students who left the college during all the six years?
 (a) 250 (b) 300 (c) 200 (d) 270 (e) 280

Directions (105-110): Study the line chart given below and answer the following questions.

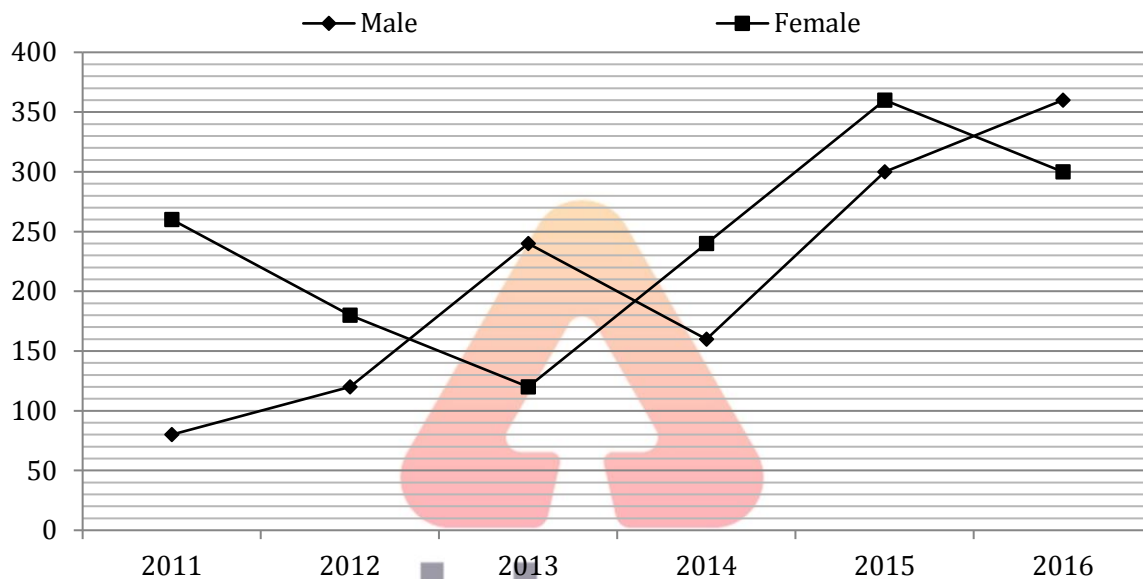
Line chart shows quantity of different product produced (in '000) by company 'X' in different years.



- 105.** Find the difference between the average of product A produced in 2015 and 2017 and average of product B produced in 2016 and 2018?
 (a) 4500 (b) 3500 (c) 2500 (d) 1500 (e) 5000
- 106.** The product C produced in 2015 and 2018 together is approximately what percent of product B produced in 2016 and 2017 together?
 (a) 105% (b) 108% (c) 110% (d) 128% (e) 115%
- 107.** In 2019 if production of product A & B shows an increment of 20% and 25% respectively in their production while production of product C decreased by 10% with respect to previous year, then find the ratio of product A & B produced together in 2019 to that of product C produced in 2019.
 (a) $\frac{19}{30}$ (b) $\frac{43}{30}$ (c) $\frac{47}{30}$ (d) $\frac{41}{30}$ (e) $\frac{61}{30}$
- 108.** The product A and B produced in 2015, 2016 & 2017 together is what percent more/less product C produced in 2017 & 2018 together?
 (a) 250% (b) 200% (c) 143.75% (d) 133.33% (e) 125%

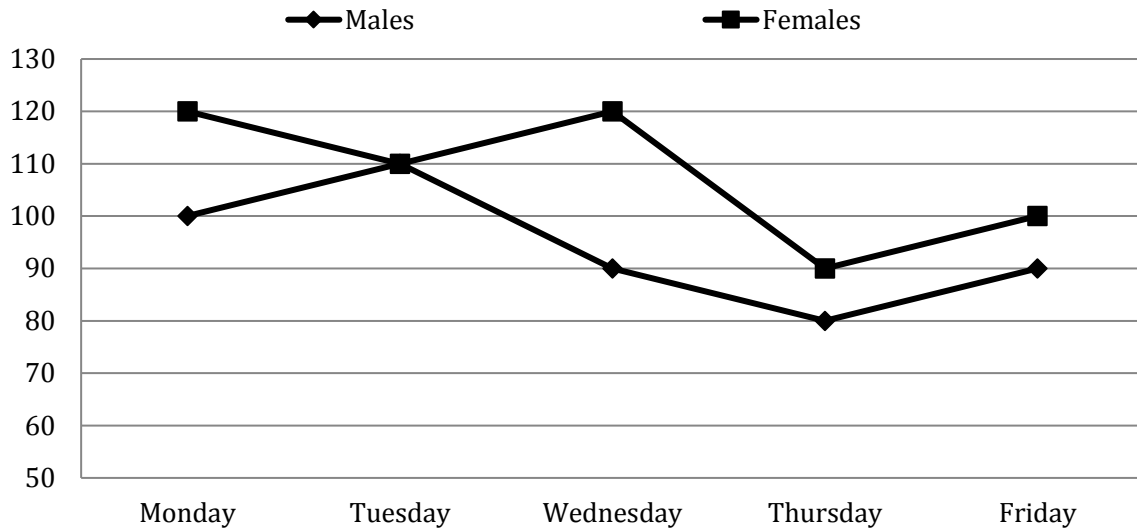
- 109.** If the product B produced in 2016 remains 15% unsold and 95% sold in 2017 as well as in 2018, then find the ratio of product B sold in 2016 & 2017 together to that of sold in 2018? (total produced = sold + unsold)
 (a) $\frac{109}{114}$ (b) $\frac{259}{114}$ (c) $\frac{119}{109}$ (d) $\frac{229}{109}$ (e) $\frac{229}{114}$
- 110.** After 2015, From the given product (A,B,C) which product shows maximum % increase /decrease in their production as compared to previous year and in which year?
 (a) Product B, 2017 (b) Product A, 2016 (c) Product C, 2018 (d) product B, 2016 (e) product C, 2017

Directions (111-115): The Line graph given below provides the information of employees (males + females) who works for an institution in six different years. Read the information carefully and answer the following questions according to it.



- 111.** Find the difference between average number of male labours from 2012, 2013 and 2015 together to the average number of female labours from 2011 and 2013 together?
 (a) 50 (b) 40 (c) 30 (d) 60 (e) 80
- 112.** Find the ratio of total male labours from 2014 and 2015 together to the total female labours from 2012 and 2013 together?
 (a) 15:23 (b) 23:15 (c) 15:17 (d) 11:23 (e) None of these
- 113.** Average number of total male labours from all the given years together is what percent more/less than the average number of female labours from 2014, 2015 and 2016 together?
 (a) 25 % (b) 50 % (c) 45 % (d) 30 % (e) 35 %
- 114.** Total male labours from 2011, 2012 and 2016 together is how much more/less than total female labours from 2011, 2013 and 2014 together?
 (a) 60 (b) 70 (c) 80 (d) 90 (e) 100
- 115.** If in 2017, total male labours and female labours is increased by 10 % and 15% respectively as compared to male and female population in 2015, then find the total numbers of male and female labours together in 2017?
 (a) 690 (b) 780 (c) 720 (d) 650 (e) 744

Directions (116-120): Given line graph shows the number of males & females visited in a shopping mall on 5 different days of a week. Study the graph carefully & answer the following questions.



- 116.** Total visitors on Tuesday are what percent of total visitors on Friday? (approx)
 (a) 86% (b) 116% (c) 110% (d) 95% (e) 125%
- 117.** What is ratio of males visited on Tuesday & Wednesday together to females visited on Monday & Friday together?
 (a) 19:22 (b) 11:10 (c) 10:11 (d) 10:23 (e) 11:23
- 118.** What is difference of average no. of males visited on Thursday & Friday together and average visitors on Tuesday?
 (a) 45 (b) 30 (c) 15 (d) 35 (e) 25
- 119.** Average no. of male visitors on all days are what percent more/less than average no. of female visitors on all days?
 (a) $12\frac{26}{27}\%$ (b) $10\frac{26}{27}\%$ (c) $9\frac{20}{27}\%$ (d) $8\frac{20}{27}\%$ (e) $15\frac{26}{27}\%$
- 120.** Total visitors on Monday & Tuesday together are how many times the total visitors on Thursday & Friday together? (approx.)
 (a) 1.08 (b) 1.65 (c) 1.35 (d) 1.22 (e) None of these

Practice MCQs for Prelims (Solutions)

- (a):** required percentage = $\frac{5}{12000} \times 10000 = 4\frac{1}{6}\%$
- (d):** required difference = $24000 \times \frac{5}{8} - 25000 \times \frac{2}{5} = 5000$
- (a):** required percentage = $\frac{12000-10000}{10000} \times 100 = 20\%$
- (d):** required ratio = $\frac{12000+25000+18000}{3} : \frac{24000+10000}{2} = 55:51$
- (b):** total no. of students who applied for SSC exam = $\frac{24000-12000}{12.5} \times 100 = 96000$
 Required difference = $96000 - 25000 = 71000$
- (b):** Required average = $\frac{(75+65+70+75+50) \times 1000}{5} = \frac{335000}{5} = 67000$
- (c):** Required percentage = $\frac{70000}{50000} \times 100 = 140\%$
- (a):** Required ratio = $\frac{95000+70000}{75000+85000} = \frac{165000}{160000} = 33:32$
- (d):** Required percentage = $\frac{75000-65000}{65000} \times 100 = \frac{10000}{65000} \times 100 = 15\frac{5}{13}\%$
- (d):** Required difference = $(95000 + 85000) - (65000 + 75000) = 180000 - 140000 = 40000$
- (b):** let total no. of article manufactured by company C and E are m and 2m respectively
 Required ratio = $\frac{(2m \times \frac{13.6}{100})}{m \times \frac{6.8}{100}} = 4:1$
- (b):** let total article manufactured in each company = 100m
 Non-defective article manufactured in company D = $100m \times \frac{96}{100} = 96m$

Non-defective article manufactured in company B
 $= 100m \times \frac{88}{100} = 88m$

Required percentage $= \frac{96m-88m}{88m} \times 100 = 9\frac{1}{11}\%$

13. (b): Total no. of article manufactured by company A =
 $\frac{96}{8} \times 100 = 1200$

14. (c): let total no. of article manufactured by company C and company D are c and d respectively.

ATQ

$$\frac{6.8\% \times c}{4\% \times d} = \frac{2}{3}$$

$$\frac{c}{d} = \frac{2}{3} \times \frac{40}{68}$$

$$c:d = 20:51$$

15. (a): non-defective article manufactured by company A
 $= \frac{200}{7-6} \times 7 \times \frac{92}{100} = 1288$

16. (d): required percentage $= \frac{320+280}{320+180} \times 100$
 $= \frac{600}{500} \times 100 = 120\%$

17. (a): required difference $= 360 - 240 = 120$ runs

18. (d): required ratio $= \frac{320+240+280+380+250}{360+320+220+300+180} = \frac{1470}{1380}$
 $= \frac{49}{46}$

19. (b): required percentage $= \frac{300-240}{300} \times 100 = 20\%$

20. (c): from graph, it is clearly visible that Australia won 3 matches i.e. third, fourth and fifth match.

21. (e): required average $= \frac{360+320+220+300}{4} = \frac{1200}{4}$
 $= 300$ runs

22. (c): required percentage $= \frac{180+300}{240+250+210} \times 100$
 $= \frac{480}{700} \times 100 = 68.57 \approx 69\%$

23. (d): required average $= \frac{180+240+300+250+210}{5}$
 $= \frac{1180}{5} = 236$

24. (d): required ratio $= \frac{250+200}{240+300} = \frac{450}{540}$
 $= 5:6$

25. (a): required difference $= 350 \times \frac{80}{100} - 300 \times \frac{3}{4}$
 $= 280 - 225 = 55$

26. (e): required difference $= (350 \times 200 + 800 \times 300) - (350 \times 300 + 800 \times 250)$
 $= 310000 - 305000 = \text{Rs } 5000$

27. (b): Required ratio $= \frac{12000+18000}{10000+8000} = \frac{30}{18}$
 $= 5:3$

28. (c): Required difference $= 14000 - 12000$
 $= 2000$

29. (d): Required average
 $= \frac{20000+18000+10000+8000+14000}{5} = \frac{70000}{5}$
 $= 14000$

30. (a): Required percentage $= \frac{18000}{15000} \times 100$
 $= 120\%$

31. (a): Required percentage
 $= \frac{(20000+10000)-(15000+10000)}{20000+10000} \times 100$
 $= \frac{30000-25000}{30000} \times 100$
 $= \frac{5000}{30000} \times 100 = \frac{50}{3}\% = 16.67\%$

32. (d): Required average $= \frac{180+240+200+250+320}{5}$
 $= \frac{1190}{5} = 238$ Quintal

33. (a): Required percentage $= \frac{320-250}{250} \times 100$
 $= \frac{70}{250} \times 100 = 28\%$

34. (b): Required ratio $= \frac{200+250}{240+320} = \frac{450}{560}$
 $= 45:56$

35. (d): Required difference $= 320 - 280 \times \frac{5}{7} = 320 - 200$
 $= 120$ quintals

36. (b): Required average $= \frac{(190+172)+(162+164)}{2} = 344$

37. (a): Required ratio $= \frac{160+190}{178+172}$
 $= \frac{350}{350} = 1:1$

38. (d): Required % $= \frac{\{(168+172)-160\}}{160} \times 100$
 $= 112.5\%$

39. (b): Required difference $= (158 + 190+162) - (168 + 172+164)$
 $= 510 - 504$
 $= 6$

40. (b): Number of Honda city car sold in Ahmedabad=320
 Number of Innova car sold in Surat=480
 Required percentage $= \frac{320}{480} \times 100 = 66\frac{2}{3}\%$

41. (d): Total Creta car sold in Delhi and Mohali together=420+280=700
 Total Innova car sold in Kolkata and Ahmedabad together=320+500=820
 Required ratio $= \frac{700}{820} = 35:41$

42. (a): total number of cars sold in Kolkata = 320 + 360 + 460 = 1140

43. (e): Total number of Honda city cars sold in delhi=540
 Total number of creta cars sold in surat=450
 Required difference=540 -450=90

44. (c): Total number of Honda city car sold in all the cities together = $460 + 320 + 340 + 540 + 420 = 2080$
 Average = $\frac{2080}{5} = 416$

45. (d): required difference = average marks scored by Student A - Average marks scored by Student B
 $\therefore \frac{70+90+60+55}{4} - \frac{50+80+75+65}{4} = \frac{5}{4} = 1.25$

46. (c): marks obtained by student A in Math and Computer together = $70 + 90 = 160$
 marks obtained by student B in Science and English together = $75 + 65 = 140$
 required ratio = $160:140 = 8:7$

47. (b): Overall percentage marks of Student B = $\frac{50+80+75+65}{400} \times 100 = 67.5$

48. (c): Marks Scored by Student A in Math = 70
 Marks Scored by Student B in Science and English = $75 + 65 = 140$
 Required % = $\frac{70}{140} \times 100 = 50\%$

49. (b): A.T.Q, passing marks = $\frac{40}{100} \times 120 = 48$
 \therefore required difference = $80 - 48 = 32$

50. (d): Average number of mangoes sold by A on all the days together = $\frac{350+240+380+210+320}{5} = 300$
 Average number of mangoes sold by C on all the days together = $\frac{320+280+160+300+290}{5} = 270$
 Required difference = $300 - 270 = 30$

51. (b): Total mangoes sold by A and B on Monday and Tuesday together = $350 + 230 + 240 + 340 = 1160$
 Total mangoes sold by B and C on Wednesday and Friday together = $280 + 160 + 250 + 290 = 980$
 Required ratio = $\frac{1160}{980} = 58:49$

52. (c): Total number of mangoes sold by seller B and C together on Friday = $250 + 290 = 540$
 Total number of mangoes sold by seller A, B and C together on Monday = $350 + 230 + 320 = 900$
 Required percentage = $\frac{540}{900} \times 100 = 60\%$

53. (a): Average number of mangoes sold by seller B on all the days together = $\frac{230+340+280+370+250}{5} = 294$

54. (c): Total Mangoes sold by seller B and C on Monday together = $230 + 320 = 550$
 Total mangoes sold by seller B and C on Thursday together = $370 + 300 = 670$
 Required difference = $670 - 550 = 120$

55. (c): Total cars sold by showroom Q in February and March together = $270 + 380 = 650$
 Total cars sold by showroom R in February and March together = $390 + 410 = 800$
 Required percentage = $\frac{650}{800} \times 100 = 81.25\%$

56. (e): Average numbers of cars sold by the showroom P in all months together = $\frac{380+440+530+290+440}{5} = 416$
 Average number of cars sold by the showroom Q in all the months together = $\frac{460+270+380+340+510}{5} = 392$
 Required difference = $416 - 392 = 24$

57. (b): Average number of cars sold by all the 3 showrooms in March month = $\frac{530+380+410}{3} = 440$

58. (d): Total numbers of cars sold by showroom P in March, April and May together = $530 + 290 + 440 = 1260$
 Total number of cars sold by showroom R in January, February and March together = $320 + 390 + 410 = 1120$

Required ratio = $\frac{1260}{1120} = 9:8$

59. (a): Total cars sold by all the 3 showrooms together in June = $530 \times \frac{120}{100} + 380 \times \frac{125}{100} + 410 \times \frac{130}{100} = 636 + 475 + 533 = 1644$

60. (c): Let total boys in school A = $45x$ and total boys in school B = $52x$
 So, girls in school A = $\frac{45x}{54} \times 46 = \frac{5x}{6} \times 46 = \frac{115x}{3}$
 And girls in school B = $\frac{52x}{52} \times 48 = 48x$
 So,
 $45x + 52x + \frac{115}{3}x + 48x = 1100$
 $135x + 156x + 115x + 144x = 3300$
 $x = 6$
 Required total number of girls = $\frac{115}{3} \times 6 + 48 \times 6 = 230 + 288 = 518$

61. (d): Girls in school A in 2014 = $\frac{288}{48} \times 52 = 312$

Girls in school B in 2014 = $\frac{264}{44} \times 56 = 336$

Required sum = $312 + 336 = 648$

62. (e): Let total boys in school A in 2014 = $4800x$

So total girls in school B in 2012 = $4800x$

Therefore, total boys in school B in 2012 = $5200x$

Girls in school A in 2014 = $\frac{4800}{48} \times 5200 = 5200x$

Required % = $\frac{5200x}{5200x} \times 100 = 100\%$

63. (e): Let girls in school B in 2016 = $50x$

So girls in school A in 2016 = $50x \times$

$\left(100\% - 16\frac{4}{5}\%\right)$

$= 50x \left(\frac{500-84}{5 \times 100}\right)$

$= \frac{208}{5}x$

Boys in school A in 2016 = $\frac{208x}{5 \times 52} \times 48$

$= \frac{192}{5}x$

Boys in school B in 2016 = $50x$

Required ratio = $\frac{192}{5 \times 50} = \frac{96}{125}$

64. (b): Boys in school A in 2015 = $700 \times \frac{62}{100} = 434$

Boys in school B in 2013 = $400 \times \frac{64}{100} = 256$

Required average = $\frac{434+256}{2} = 345$

65. (c): Required percentage = $\frac{300-240}{300} \times 100$

$= \frac{60}{300} \times 100 = 20\%$

66. (d): Required percentage = $\frac{230+320}{250} \times 100$

$= 220\%$

67. (a): Required average = $\frac{180+230+320+360+120}{5}$

$= \frac{1210}{5} = 242$

68. (d): Required ratio = $\frac{230+360}{300+240} = \frac{590}{540}$

$= 59 : 54$

69. (a): Required percentage = $\frac{(360+300)-(120+240)}{(120+240)} \times 100$

$= \frac{660-360}{360} \times 100 = \frac{300}{360} \times 100$

$= \frac{250}{3} \% = 83\frac{1}{3} \%$

Sol (70-74):

For 2014

No. of article manufactured = 800

No. of article sold = $800 \times \frac{80}{100} = 640$

For 2015

No. of article manufactured = 740

No. of article available for selling = $740 + 800 \times \frac{20}{100} = 900$

No. of article sold = $900 \times \frac{80}{100} = 720$

No. of article unsold = $900 \times \frac{20}{100} = 180$

For 2016

No. of article manufactured = 520

No. of article available for selling = $520 + 180 = 700$

No. of article sold = $700 \times \frac{70}{100} = 490$

No. of article unsold = $700 \times \frac{30}{100} = 210$

For 2017

No. of article manufactured = 490

No. of article available for selling = $490 + 210 = 700$

No. of article sold = $700 \times \frac{70}{100} = 490$

No. of article unsold = $700 \times \frac{30}{100} = 210$

For 2018

No. of article manufactured = 550

No. of article available for selling = $550 + 210 = 760$

No. of article sold = $760 \times \frac{80}{100} = 608$

No. of article unsold = $760 - 608 = 152$

70. (a): required difference = $720 - 640 = 80$

71. (c): in year 2017 no. of article sold are equal to no. of article sold in 2016.

72. (b): required percentage = $\frac{490}{490} \times 100 = 100\%$

73. (b): required sum = $520 + 550 = 1070$

74. (b): required ratio = $720 : 760$
 $= 18 : 19$

75. (c): Required difference

$= 570 - \frac{(500+550+480+600+650+580)}{6}$

$= 570 - 560 = 10$

76. (a): Required percentage = $\frac{(500+600)}{(600+400)} \times 100$

$= \frac{1100}{1000} \times 100 = 110\%$

77. (d): Required ratio = $\frac{(450+570+600)}{(500+550+480)} = \frac{1620}{1530}$

$= \frac{18}{17}$

78. (b): Required amount = $3360 \times 1500 - 3370 \times 1200$
 $= \text{Rs } 996000$

79. (e): Required sum = $650 \times \frac{14}{13} + 480 \times \frac{13}{12}$
 $= 700 + 520 = 1220$

80. (d): Required ratio = $\frac{(450+360+400) \times 100}{(450+560+420) \times 100} = \frac{1210}{1430} = \frac{11}{13}$

81. (d): required difference = $\frac{(520+480+450+560) \times 100}{4} - \frac{(450+360+400+450+540) \times 100}{5}$
 $= 50250 - 44000$
 $= 6250$

- 82. (a):** Required percentage

$$= \frac{(520+450) \times 100 - (360+450) \times 100}{(360+450) \times 100} \times 100$$

$$= \frac{970-810}{810} \times 100$$

$$= \frac{1600}{81} \approx 20\%$$
- 83. (b):** total production of cars in year 2012 = $(450 \times \frac{100}{112.5} + 520 \times \frac{100}{80}) \times 100$

$$= (400 + 650) \times 100$$

$$= 105000$$
- 84. (e):** Unsold Ford cars in year 2017 = $(540 - \frac{70}{100} \times 450 \times \frac{10}{9}) \times 100$

$$= 54000 - 35000$$

$$= 19000$$
- 85. (c):** required average = $\frac{56000 - \frac{30}{100} \times 56000}{4} = \frac{39200}{4}$

$$= 9800$$
- 86. (d):** required difference = $\frac{(15+25)-(20+10)}{100} \times 56000$

$$= 5600$$
- 87. (d):** required percentage = $\frac{30 \times \frac{7}{12} - 15 \times \frac{7}{15}}{15 \times \frac{7}{15}} \times 100$

$$= \frac{2100}{14} \% = 150\%$$
- 88. (d):** average no. of students is 20% of the total students, so from graph, university B have 20% students.
- 89. (b):** required ratio = $\frac{14100}{\frac{30}{100} \times 56000} = \frac{141}{168} = \frac{47}{56}$
- 90. (a):** required average = $\frac{3000+4500+5500+5000+6000}{5}$

$$= \frac{24000}{5} = 4800$$
- 91. (d):** required percentage = $\frac{3000+4000}{3000+4000} \times 100 = 100\%$
- 92. (b):** required ratio = $\frac{3000+5500+5000}{4000+3000} = \frac{13500}{7000} = \frac{27}{14}$
- 93. (c):** required percentage = $\frac{(5500+5000)-(3500+4000)}{(3500+4000)} \times 100$

$$= \frac{3000}{7500} \times 100 = 40\%$$
- 94. (e):** required difference

$$= (3000 + 4500 + 5500 + 5000 + 6000) -$$

$$(3500 + 4000 + 4500 + 3000 + 4000)$$

$$= 24000 - 19000 = 5000$$
- 95. (e):** Required % = $\frac{2500+7500}{2500+10000} \times 100 = 80\%$
- 96. (b):** Sedans sold by Hyundai = $\frac{90}{100} \times (9000 + 3000) \times \frac{20}{27}$

$$= 8000$$

- SUVs sold by Hyundai = $\frac{90}{100} \times (9000 + 3000) \times \frac{7}{27}$

$$= 2800$$
- Required % = $\frac{3000-2800}{9000-8000} \times 100$

$$= 20\%$$
- 97. (d):** Selling price of each SUVs of Toyota = $\frac{150}{1500} = 0.1$ crores
 Selling price of each SUVs of Hyundai = $\frac{180}{3000} = 0.06$ crores
 Required difference = $0.1 - 0.06 = 0.04$ crores
- 98. (c):** Average number of sedans sold by all 5 companies

$$= \frac{2500+10500+9000+4000+7500}{5}$$

$$= \frac{33500}{5} = 6700$$
 So, required number of companies = 3
- 99. (b):** Required ratio = $\frac{8000+6000}{10500+7500}$

$$= \frac{14000}{18000} = 7 : 9$$
- 100. (b):** Number of students who joined the college in year 2013 and 2014 together

$$= 450 + 800 = 1250$$
 Number of students who left the college in year 2012 and 2013 together

$$= 500 + 700$$

$$= 1200$$
 Required percentage = $\frac{1250-1200}{1200} \times 100$

$$= \frac{50}{1200} \times 100$$

$$= 4\frac{1}{6} \%$$
- 101. (e):** For year 2011 = $\frac{600-400}{400} \times 100 = 50\%$
 For year 2012 = $\frac{100}{600} \times 100 = 16\frac{2}{3} \%$
 For year 2013 = $\frac{200}{500} \times 100 = 40\%$
 For year 2014 = $\frac{400}{700} \times 100 = \frac{400}{7} \% = 57\frac{1}{7} \%$
 For year 2015 = $\frac{250}{300} \times 100 = \frac{250}{3} \% = 83\frac{1}{3} \%$
 Answer \rightarrow 2015
- 102. (a):** Required average = $\frac{500+400+600+450+800+600}{6} = 558\frac{1}{3}$
- 103. (c):** Number of students studying in year 2012

$$= 5000 + 500 + 400 + 600 - 400 - 600 - 500$$

$$= 5000$$
 Number of students studying in year 2013

$$= 5000 + 450 - 700 = 4750$$
 Required % = $\frac{(5000-4750)}{5000} \times 100$

$$= \frac{250}{5000} \times 100$$

$$= 5\%$$

104. (b): Total number of students who joined the college in all the six years = 3350
 And, the total number of students who left the college in all the six years
 $= 400 + 600 + 500 + 750 + 300 + 550$
 $= 3050$
 Required difference = $3350 - 3050 = 300$

105. (c): The average of product A in 2015 & 2017 = $\frac{45000+35000}{2} = 40000$
 The average of product B in 2016 & 2018 = $\frac{45000+30000}{2} = 37500$
 So required difference = $40000 - 37500 = 2500$

106. (b): Product C produced in 2015 and 2018 together = $20000 + 50000 = 70000$
 Product B produced in 2016 and 2017 together = $45000 + 20000 = 65000$
 Required % = $\frac{70000}{65000} \times 100 \approx 108\%$

107. (e): For 2019
 Product A produced = $45000 \times \frac{120}{100} = 54000$
 Product B produced = $30000 \times \frac{125}{100} = 37500$
 Product C produced = $50000 \times \frac{90}{100} = 45000$
 Required ratio = $\frac{54000+37500}{45000} = \frac{61}{30}$

108. (c): Product A & B produced in 2015, 2016, 2017 together = $(45 + 25 + 35 + 25 + 45 + 20) \times 1000 = 195000$
 Product C produced in 2017 & 2018 together = $(50 + 30) \times 1000 = 80000$
 Required % = $\frac{(195000 - 80000)}{80000} \times 100 = 143.75\%$

109. (e): Product B sold in 2016 = $45000 \times \frac{85}{100} = 38250$
 Product B sold in 2017 = $20000 \times \frac{95}{100} = 19000$
 Product B sold in 2018 = $30000 \times \frac{95}{100} = 28500$
 Required ratio = $\frac{38250+19000}{28500} = \frac{229}{114}$

110. (d): Going as per the option we have
 For product B in 2017 = (% decrease = $\frac{45-20}{45} \times 100 = 55.55\%$)
 For product A in 2016 = (% decrease = $\frac{45-25}{45} \times 100 = 44.44\%$)
 For product C in 2018 = (% increase = $\frac{50-30}{30} \times 100 = 66.67\%$)
 For product B in 2016 = (% increase = $\frac{45-25}{25} \times 100 = 80\%$)
 For product C in 2017 = No change.
 So, the maximum % increase or decrease can only be seen in product B in 2016 = 80%

111. (c): Average number of male labours from 2012, 2013 and 2015 together = $\frac{120+240+300}{3} = 220$
 Average number of female labours from 2011 and 2013 together = $\frac{260+120}{2} = 190$
 Required difference = $220 - 190 = 30$

112. (b): total male labours from 2014 and 2015 together = $300 + 160 = 460$
 total female labours from 2012 and 2013 together = $180 + 120 = 300$
 Required ratio = $\frac{460}{300} = \frac{23}{15} = 23:15$

113. (d): Average number of total male labours from all the given years together = $\frac{80+120+240+160+300+360}{6} = 210$
 average number of female labours from 2014, 2015 and 2016 together = $\frac{240+360+300}{3} = 300$
 Required percentage = $\frac{300-210}{300} \times 100 = 30\%$

114. (a): Total male labours from 2011, 2012 and 2016 together = $80 + 120 + 360 = 560$
 total female labours from 2011, 2013 and 2014 together = $260 + 120 + 240 = 620$
 Required difference = $620 - 560 = 60$

115. (e): total male labours in 2017 = $300 \times \frac{110}{100} = 330$
 total female labours in 2017 = $360 \times \frac{115}{100} = 414$
 total numbers of male and female labours together in 2017 = $330 + 414 = 744$

116. (b): required % = $\frac{110+110}{90+100} \times 100 = 115.79\% \approx 116\%$

117. (c): required ratio = $\frac{110+90}{120+100} = 10:11$

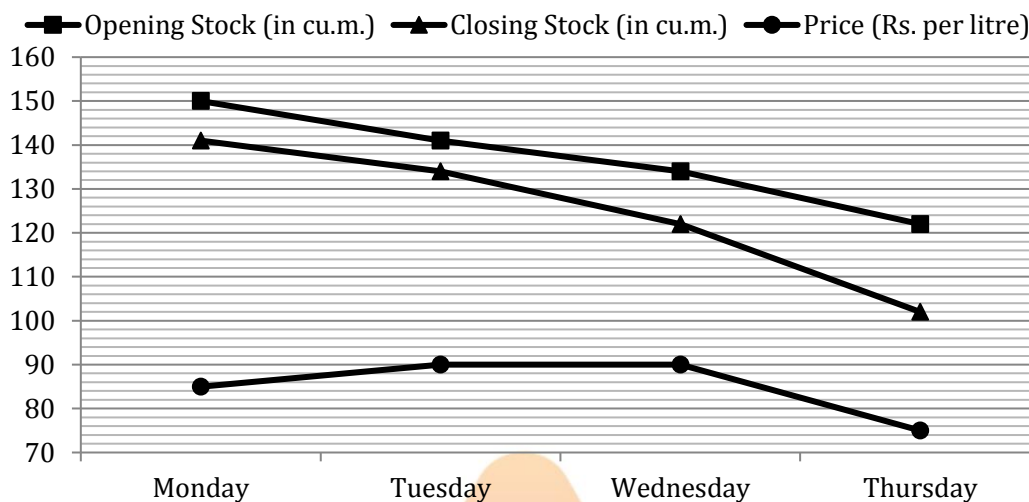
118. (e): required difference = $\frac{110+110}{2} - \frac{80+90}{2} = 25$
 (since difference is asked so only magnitude is counted)

119. (a): average male visitors on all days = $\frac{100+110+90+80+90}{5} = 94$
 Average Female visitors on all days = $\frac{120+110+120+90+100}{5} = 108$
 Required % = $\frac{108-94}{108} \times 100 = 12\frac{26}{27}\%$

120. (d): Total visitors on Monday & Tuesday = $100 + 120 + 110 + 110 = 440$
 Total visitors on Thursday & Friday = $80 + 90 + 90 + 100 = 360$
 Required answer = $\frac{440}{360} = 1.22$ times

Practice MCQs for Mains

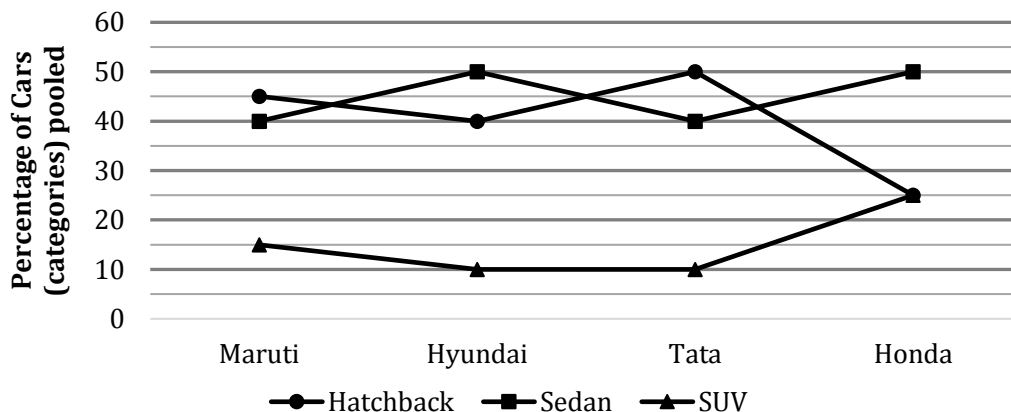
Directions (1-5):- Given line graph shows the opening & closing stock of a District Oil Distributor Centre and the price of oil for 4 different days. Study the graph carefully and answer the questions.



Note:- 1 cubic meter=1000 litre

- Find the amount earned on Thursday. (in lakh)
 (a) 14 (b) 17 (c) 18 (d) 15 (e) 16
- Volume of oil sold on Monday & Tuesday together is what percent more/less than average volume of oil sold on all days together?
 (a) $66\frac{2}{3}\%$ (b) 40 (c) $33\frac{2}{3}\%$ (d) $66\frac{1}{3}\%$ (e) $33\frac{1}{3}\%$
- What is total earning for all the mentioned days? (in lakhs)
 (a) 3.9 (b) 0.39 (c) 38.75 (d) 0.039 (e) 39.75
- If on Friday, the sale decreases by 10% as compared to that on Thursday but the price increased by 20%. Find ratio of earning on Wednesday & Friday together to that on Monday, Tuesday & Thursday together.
 (a) 577:740 (b) 540:579 (c) 740:577 (d) 579:740 (e) None of these
- On how many days, does the earning exceeds the average earning of the week if sale occurred on Friday is also counted. (Use sale data on Friday from previous question)
 (a) 3 days (b) 4 days (c) 2 days (d) 5 days (e) 1 days

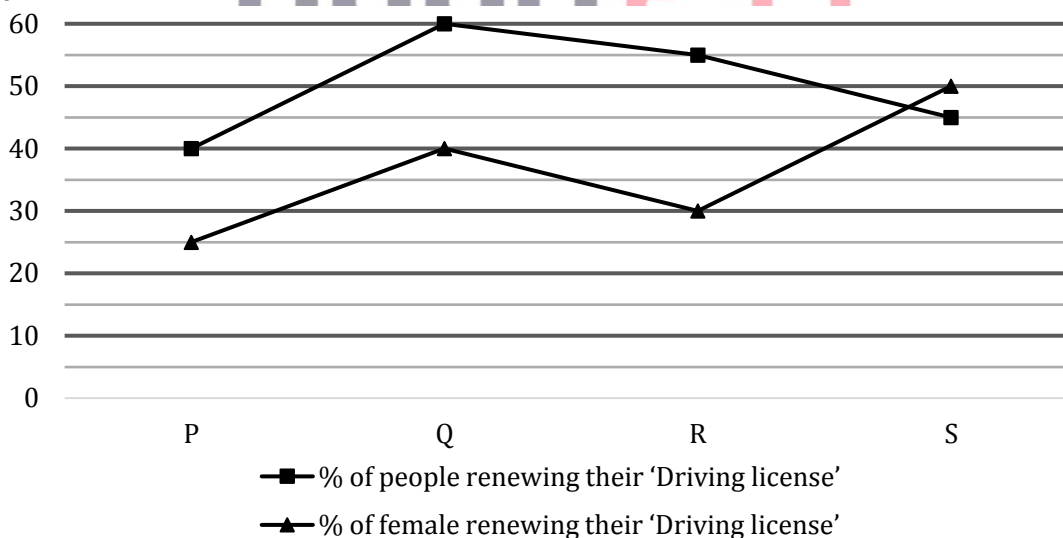
Directions (6 – 11): Given line chart shows the percentage of various categories (hatchback, sedan & suv) of cars of 4 manufacturers pooled as taxi in Gurgaon city. Read the data carefully & answer the questions.



6. If ratio of Maruti & Hyundai cars is 4 : 3 then by what percent sedan cars of Maruti are more/less than Hatchback cars of Hyundai?
 (a) $33\frac{1}{3}\%$ (b) 25 % (c) 10% (d) $13\frac{1}{3}\%$ (e) $16\frac{2}{3}\%$
7. No. of Hatchback cars of Maruti & Hyundai together is 50 more than no. of hatchback cars of Tata. Total cars of Maruti, Hyundai, Tata & Honda is in ratio 4 : 3 : 5 : 2 respectively. What is difference between sedan cars of Tata & hatchback cars of Honda?
 (a) 145 (b) 165 (c) 155 (d) 150 (e) 160
8. If there are total 700 cars of Tata & Honda together then how many sedan cars of Tata are there? (Consider SUV cars of both manufacturers are same).
 (a) 280 (b) 150 (c) 200 (d) 250 (e) 170
9. If SUV cars of Maruti are twice that of Hyundai and Hyundai cars (total) are 50% more than Honda cars (total). What is ratio of total number of Hatchback & Sedan cars of Maruti to that of Sedan & SUV cars of Honda?
 (a) 22 : 15 (b) 17 : 15 (c) Cannot be determined (d) 9 : 5 (e) 34 : 15
10. There are equal no. of SUV cars of Tata & Honda in the city. By what percent Honda cars (total) are more/less than Tata cars (total)?
 (a) 55% (b) 60% (c) 150%
 (d) Cannot be determined (e) None of these
11. In city, the ratio of Hatchback cars (Maruti & Hyundai) to SUV cars (Maruti & Hyundai) is 10 : 3. Then, what could be difference of Sedan cars of Maruti & Hyundai? (difference of SUV cars of Maruti & Hyundai is divisible by both 2 & 5)
 (a) 15 (b) 20 (c) 35
 (d) 10 (e) 5 (f) 30
 (a) B, D, F (b) C, E (c) A, B, D, F
 (d) A, B, D, E (e) Cannot be determined

Direction (12 – 15): Line graph given below shows percentage of people renewing their 'Driving license' in four Different RTO offices and also shows percentage of female renewing their 'Driving license' in these four RTO offices. Read the data carefully and answer the questions.

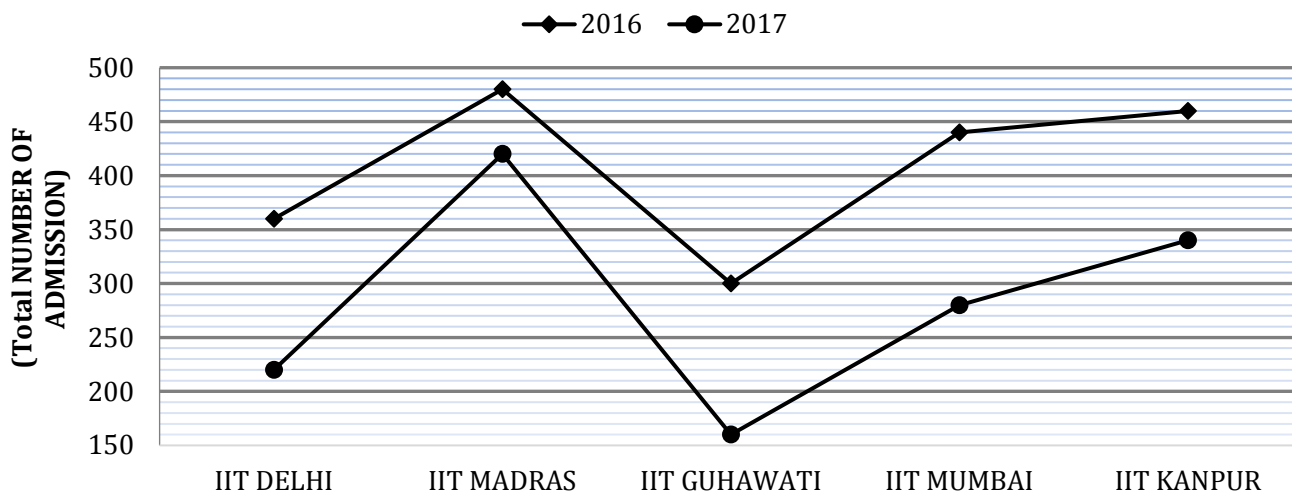
Note – Total people visited to RTO offices = Total people renewing their 'Driving license' + Total people applying for new 'Driving license'.



12. Total male visited office P for renewing their 'Driving license' is 1800 and total female visited office Q for applying new 'Driving license' is 1280. If total female visited office Q for applying new 'Driving license' is 64% of total people applying for new 'Driving license' in Q, then find ratio of total people visited office P to that of office Q?
 (a) 6 : 5 (b) 5 : 6 (c) 2 : 3 (d) 3 : 2 (e) 1 : 3

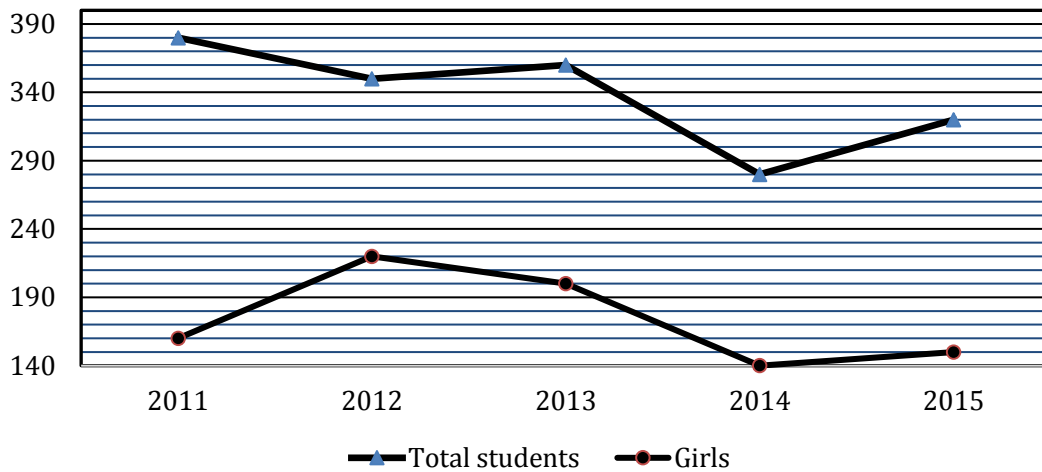
13. Total male applying for new 'Driving license' in office Q is 60% of total people applying for new 'Driving license' in that office and total male renewing their 'Driving license' in same office is 2880. Total male applying for new 'Driving license' in R is 384 more than total female renewing their 'Driving license' in same office. Find difference between total female visited Q & R for applying for new 'Driving license', if male applying for new 'Driving license' in R is 58% of total people applying for new 'Driving license' in R.
 (a) 548 (b) 506 (c) 512 (d) 524 (e) 536
14. If total number of female renewing their 'Driving license' in office S is 2250 and ratio between male to female applying for new 'Driving license' in same office is 7 : 3, then find difference between number of male & female applying for new 'Driving license' from S?
 (a) 1800 (b) 2200 (c) 2400 (d) 1600 (e) 2000
15. If difference between male and female renewing their 'Driving license' from P is 1200 and total male renewing their 'Driving license' from S is 2700, then find total people visited in office P is what percent less than total people applying for new 'Driving license' in S?
 (a) 10% (b) 12.5% (c) $4\frac{1}{11}\%$ (d) $9\frac{1}{11}\%$ (e) $11\frac{1}{9}\%$

Directions (16-19): Given below line graph shows total number of students take admission for B.TECH course in five different IIT's in the 2016 & 2017. Read the graph carefully and answer the questions :



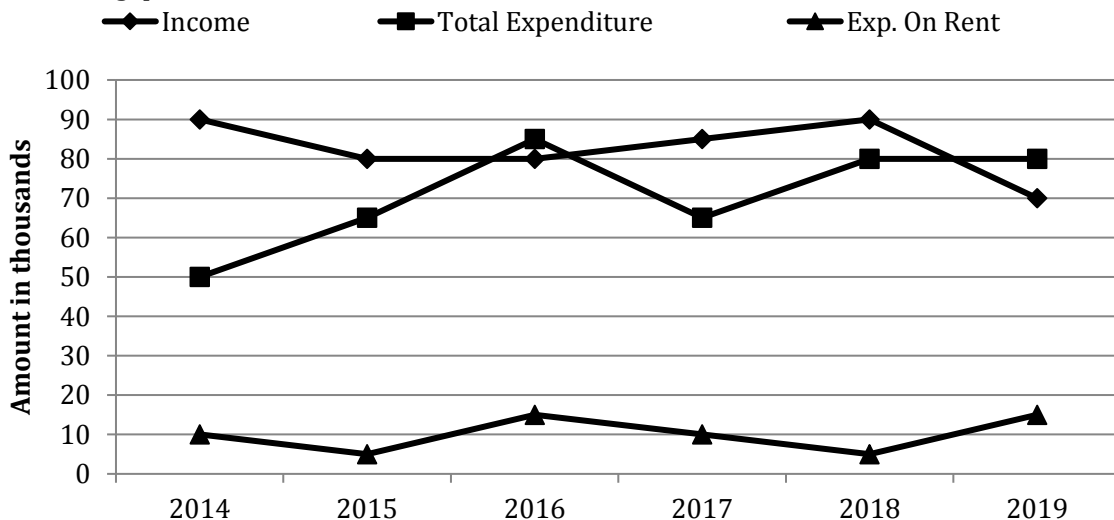
16. If $11\frac{1}{9}\%$ of total students take admission in IIT DELHI in the year 2016 and $14\frac{2}{7}\%$ of total students take admission in IIT MADRAS in the year 2017 are belongs to 'SC' category then find total students who did not belongs to 'SC' category from both IIT's in the year 2016 & 2017?
 (a) 640 (b) 560 (c) 680 (d) 600 (e) 640
17. Out of total students take admission in IIT MADRAS in the year 2016 ratio between girls to boys is 1 : 5, then find total boys take admission in IIT MADRAS in the year 2016 are what percent less than total students take admission in same IIT in the year 2017?
 (a) $3\frac{16}{21}\%$ (b) $4\frac{16}{21}\%$ (c) $5\frac{16}{21}\%$ (d) $2\frac{16}{21}\%$ (e) $7\frac{16}{21}\%$
18. Find the difference between average of number of students take admission in IIT KANPUR in the both years and average of number of students take admission in IIT GUHAWATI in the both years?
 (a) 120 (b) 100 (c) 160 (d) 170 (e) 150
19. 50% of total students in the year 2016 and 25% of total students in the year 2017 take admission in IIT DELHI belongs to general & OBC category respectively. Then find total students take admission in the year 2016 belonging to general category is what percent more than total students take admission in the year 2017 belonging to OBC category in IIT DELHI?
 (a) $223\frac{3}{11}\%$ (b) $225\frac{3}{11}\%$ (c) $209\frac{3}{11}\%$ (d) $219\frac{3}{11}\%$ (e) $227\frac{3}{11}\%$

Direction (20 – 23): Given below line graph shows total number of students (boys + girls) in five different years in a college 'X', also shows total number of girls. Read the data carefully and answer the questions.



20. $\frac{9}{11}$ th of total boys in 2011 and $\frac{5}{7}$ th of total boys in 2014 appeared in exam. If 60% of total boys in 2011 & 72% of total boys in 2014 passed the exam, then find ratio of total girls in 2015 to total passed boys in 2011 & 2014 together?
 (a) 5 : 7 (b) 5 : 9 (c) 5 : 8 (d) 5 : 6 (e) 5 : 4
21. In 2016 in college X, total students increased by 25% over the year 2015 and total students in college 'Y' in 2016 are 40% more than that of total students in college 'X' in same year. If sum of girls in the both colleges are 540 and total boys in college 'X' are 20 more than total boys in college 'Y' and each boy annual fee in college 'Y' in the year 2016 is Rs. 12000, then find total amount boys paid in college 'Y' (in lakh Rs.)?
 (a) 24 (b) 22 (c) 20 (d) 18 (e) None of these
22. Sum of total girls in the year 2015, 2016 & 2017 is 600 and total boys in the year 2015 & 2017 together is 100 more than total boys in the year 2016. If total girls in 2016, 2017 is 60% & 70% of total students in college, then find total boys in 2017 is what percent less than total boys in 2016?
 (a) 41.25% (b) 43.75% (c) 43.25% (d) 44.75% (e) 42.25%
23. Average number of boys in the given years in college are what percent more than total boys in the year 2013?
 (a) 1.5% (b) 2% (c) 1% (d) 2.5% (e) 3.5%

Directions (24-28): Given line graph shows the income & expenditure of a person over 6 years. Study the graph carefully and answer the following questions.



[NOTE:]

Profit = Income – Expenditure;

Loss = Expenditure – Income

Profit % = (profit/expenditure) * 100

Loss % = (loss/expenditure) * 100

Total Expenditure = Expenditure on Rent + Other Expenditure]

24. What is the ratio of profit in 2014 to that of 2018?

- (a) 4 : 1 (b) 5 : 8 (c) 16 : 17 (d) 6 : 1 (e) 12 : 17

25. What is the profit percentage in year 2015 and 2017 together?(in approx.)

- (a) 22% (b) 24% (c) 25% (d) 29% (e) 27%

26. What is the difference of average profit and average loss?

- (a) Rs. 60000 (b) Rs. 27500 (c) Rs. 13750 (d) Rs. 11000 (e) Rs. 10625

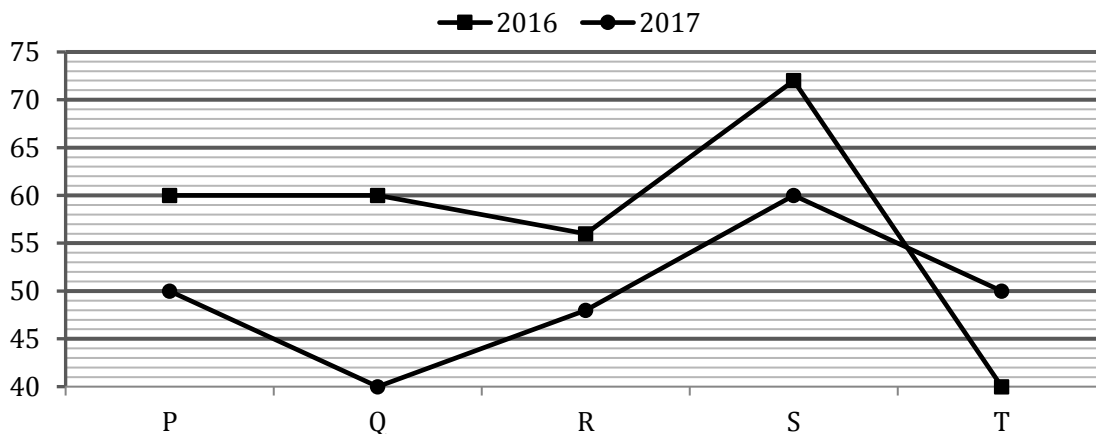
27. Total other expenditure is what percent of total expenditure? (approx.)

- (a) 84% (b) 86% (c) 88% (d) 90% (e) 92%

28. For how many years the other expenditure is more than the average expenditure?

- (a) 3 (b) 5 (c) 4 (d) 1 (e) 2

Direction (29 –33): Given below line graph shows total sold cycle of five different companies (in %) out of total manufactured cycle in two years. Total manufactured cycle by a company is same for both the years.



Note – Manufactured cycles = Sold cycles + Unsold cycles

29. Find the difference between total manufactured cycles by S & T?

I. Difference between cycles sold by S in 2016 and unsold cycles by T in 2017 is 1280.

II. Difference between total unsold cycles by S in 2017 and total sold cycles by T in 2016 is 3200.

- (a) Statement (I) alone is sufficient to answer the question but statement (II) alone is not sufficient to answer the questions.
 (b) Statement (II) alone is sufficient to answer the question but statement (I) alone is not sufficient to answer the question
 (c) Both the statements taken together are necessary to answer the questions, but neither of the statements alone is sufficient to answer the question.
 (d) Either statement (I) or statement (II) is sufficient to answer the question.
 (e) Statements (I) and (II) together are not sufficient to answer the question.

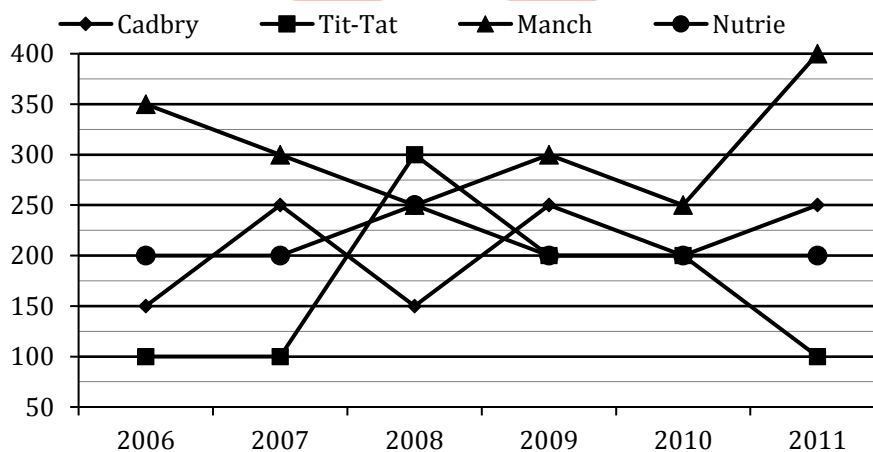
30. If average unsold cycles in R in both the years is 7680 and total manufactured cycle by P is 40% more than total that of R, then find difference between total Sold cycles by P in both the years?

- (a) 2280 (b) 2260 (c) 2200 (d) 2220 (e) 2240

31. If out of total unsold cycles some cycles were added as stock for next year, then find the stocks added by Q for 2017.
- Stocks added by Q for 2017 is 62.5% less than total sold cycles by Q in 2017, while difference between total sold cycles by Q in both the years is 6400.
 - Q added 37.5% of its total unsold cycles in 2016 for 2017, while difference between total sold cycles by Q in both the years is 6400.
- Statement (I) alone is sufficient to answer the question but statement (II) alone is not sufficient to answer the questions.
 - Statement (II) alone is sufficient to answer the question but statement (I) alone is not sufficient to answer the question
 - Both the statements taken together are necessary to answer the questions, but neither of the statements alone is sufficient to answer the question.
 - Either statement (I) or statement (II) is sufficient to answer the question.
 - Statements (I) and (II) together are not sufficient to answer the question.
32. Ratio of total manufactured cycles by R in 2016 & T in 2017 is 3 : 4 and difference between total sold cycles by R in 2016 & T in 2017 is 192. If total unsold cycles which manufactured by S in 2017 is equal to total unsold cycles by R & T in 2016 together, then find total number of unsold cycles by P in 2017, given total manufactured cycles by S in 2017 is 75% of total manufactured cycles P in same years.
- 3700
 - 3680
 - 3580
 - 3720
 - 3820
33. If total cycles manufactured by S in 2016 is 20% more than that of T in 2017 and sum of total sold cycles by both companies in the year 2016 is 2528, then find total unsold cycles by both the companies in the year 2017.
- 1800
 - 1960
 - 1600
 - 1400
 - 1500

Directions (34-38): Answer the questions on the basis of the information given below.

Sales (by volume) of chocolates by different companies (in lakh units)



Revenue = Sales (by volume) × Selling price of each chocolate

Profit = Revenue – Expenditure

Profit percent = $\frac{\text{Revenue} - \text{Expenditure}}{\text{Expenditure}} \times 100$

34. The market share of a company is defined as the volume of the sales of the company as a percentage of the total sales volume of all the four given companies. In which year was the market share of Manch the highest?
- 2011
 - 2008
 - 2006
 - 2009
 - 2010
35. In the year 2010, if the profit percent on selling each Cadbury chocolate is 25%, and the selling price of each Cadbury chocolate is Rs. 10, what was the expenditure incurred by Cadbury in making chocolates?
- Rs. 12 crore
 - Rs. 14 crore
 - Rs. 16 crore
 - Rs. 10 crore
 - Rs. 8 crore
36. In the year 2009, the expenditures of Cadbury, Tit-Tat, Manch and Nutrie are in ratio 3 : 2 : 6 : 8. Which company had the highest profit percentage in 2009?
- Cadbury
 - Manch
 - Nutrie
 - Cannot be determined
 - Tit-Tat

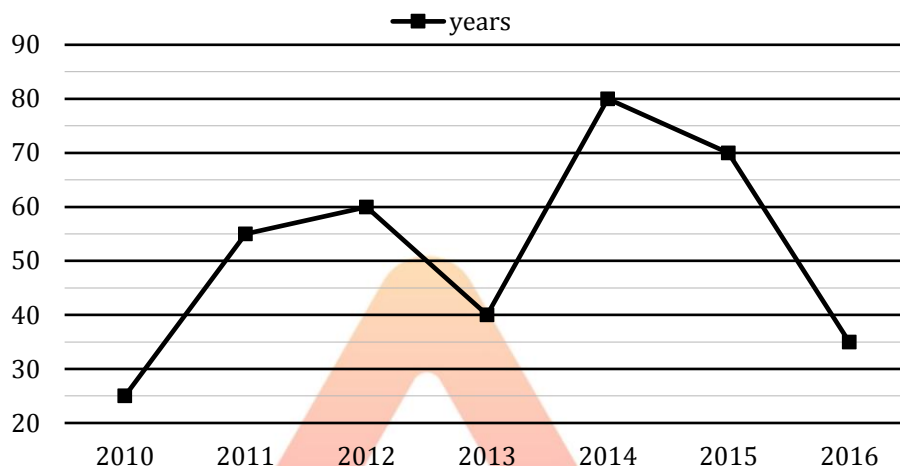
37. Which company had the highest growth rate for the period 2006 to 2010?

- (a) Tit-Tat (b) Cadbury (c) Nutrilite (d) Manch (e) none of these

38. Total sales (by volume) of cadbury from 2007 to 2010 are what percent more/less than the total sales (by volume) of nutrilite from 2008 to 2011?

- (a) 100% (b) 50% (c) 150% (d) 200% (e) 0%

Directions (39 – 43): The following line graph shows the percentage of the number of candidates who qualified an examination out of the total number of candidates who appeared for the examination over period of seven years from 2010 to 2016.



39. If the number of qualified boys in year 2011 is 1210 and ratio of number of qualified boys and girls is 11 : 9, then find the total number of students who are not qualified in year 2011.

- (a) 2500 (b) 1800 (c) 1300 (d) 1900 (e) 1600

40. If the ratio of total number of students who appeared in year 2016 and 2017 is 7 : 9 and ratio of number of boys to girls who qualified in year 2017 is 4 : 5, then find the difference in number of unqualified boys and girls in year 2017. [Given that total number of students appeared in year 2016 is 1400].

- (a) 70 (b) 90 (c) 120
(d) Cannot be determined (e) 180

41. If the total number of students in year 2013 is 40% more than the total number of students in year 2015, then the number of students who are not qualified in year 2013 is what percent more than number of students who are not qualified in year 2015?

- (a) 180% (b) 160% (c) 135% (d) 125% (e) 170%

42. If the number of qualified boys in year 2009 is 770 which is 35% of the total number of qualified students in year 2010 and ratio of total number of qualified students in year 2009 to that in year 2010 is 7 : 11, then find the ratio of total number of students in year 2009 to that in year 2010. (Number of qualified students in year 2009 is 20% of the total number of students appeared in that year).

- (a) 44 : 31 (b) 31 : 44 (c) 35 : 44 (d) 44 : 35 (e) 35 : 41

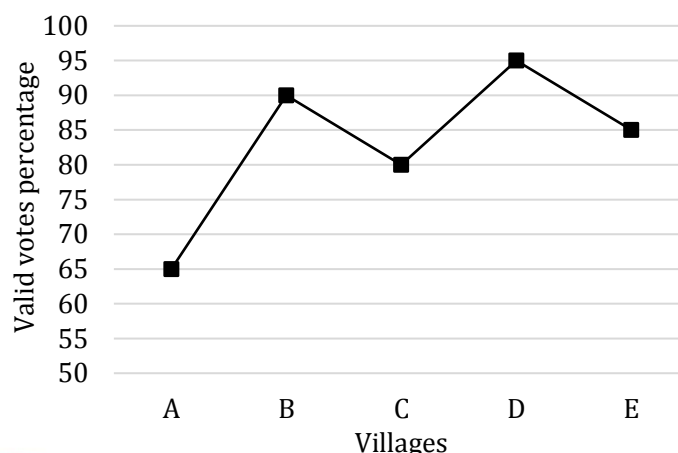
43. If total number of students appeared in year 2012 is 4200 which is 80% of the number of students appeared in year 2014, then find the total number of unqualified girls in year 2012 and unqualified boys in year 2014. [Given that number of unqualified boys are 50% more than number of unqualified girls for both years].

- (a) 1502 (b) 1202 (c) 1402 (d) 1302 (e) 1602

Directions (44-48): Given below are two-line graphs, first line graph shows the percentage of voters who polled votes out of total voters from five different villages in the elections held in year 2016. Second line graph shows the percentage of valid votes polled out of total votes polled in these villages.

Note → Total voters = voters who polled votes + voters who did not poll votes

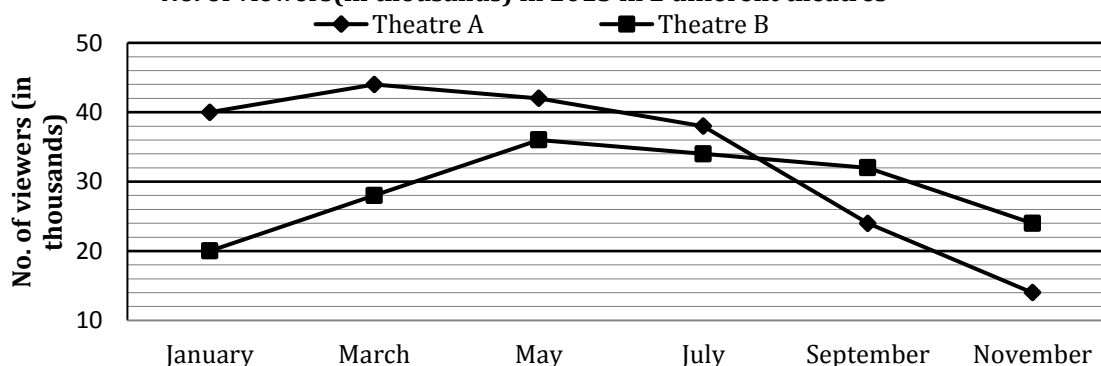
Total votes polled = valid votes polled + invalid votes polled



44. If difference between the total votes polled and valid votes polled from village C is 3740 and sum of total votes polled and invalid votes polled from village D is 9450 then find the total voters from village C and D together.
 (a) 35500 (b) 36000 (c) 33000 (d) 32000 (e) 34000
45. If ratio of total voters from village E to village B is 7 : 9 and ratio of males to female in the invalid votes of village E and village B is 4 : 3 and 3 : 2 respectively then females who cast invalid votes from village E are what percent of males, who cast invalid votes from village B? (approximately)
 (a) 96% (b) 88% (c) 80% (d) 75% (e) 82%
46. In village A, only two contestants participated in the election and winner got $52\frac{1}{2}\%$ of the total valid votes and won by 390 votes. Find the total voters in village A.
 (a) 13,500 (b) 12,000 (c) 15,000 (d) 14,000 (e) 10,000
47. In village D, if it was found that percentage of votes polled which are valid is 80% instead of 95% (as given in line graph) then total valid votes are decreased by 1350. If ratio of total voters from village D to village E is 6 : 7 then, find total valid votes polled in village E.
 (a) 11305 (b) 11200 (c) 10805 (d) 9500 (e) 10985
48. If total voters in village A is 15000 out of which 60% are males and ratio of males to females in total valid votes for same village is 9 : 13, then how many females are there who did not poll the votes?
 (a) 870 (b) 1420 (c) 1320 (d) Can't be determined (e) 2200

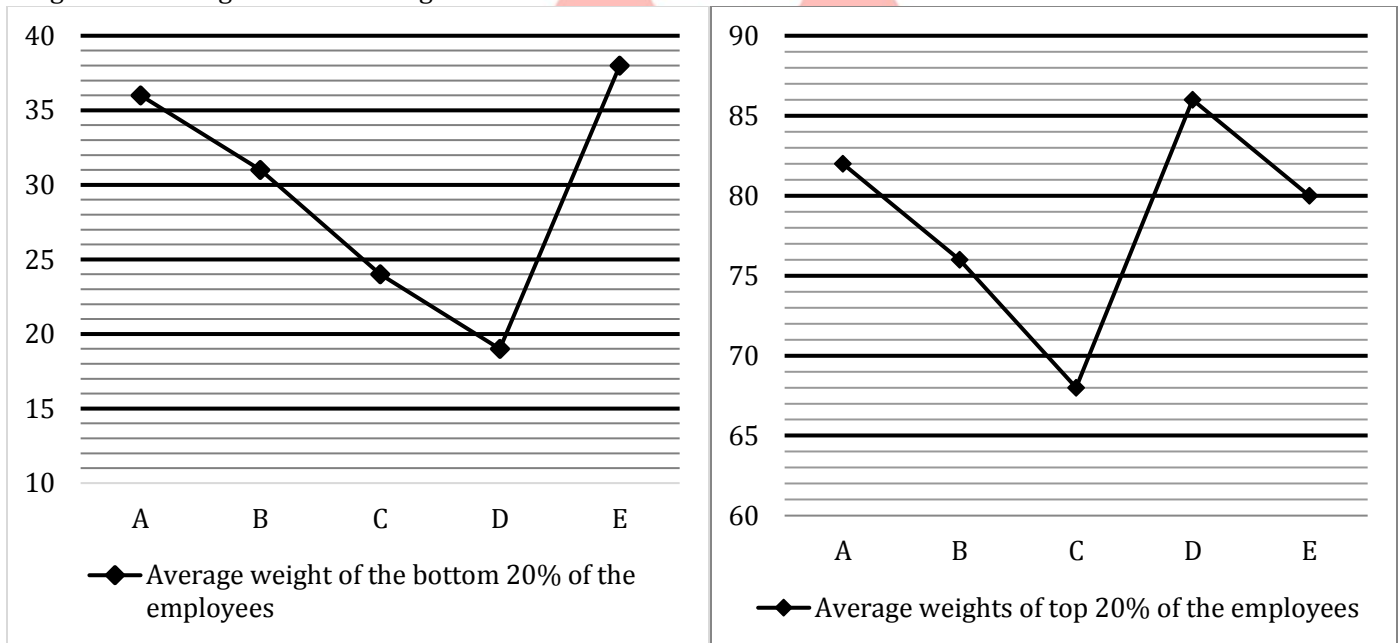
Directions (49-53): Study the following line graph carefully and answer the following questions.

No. of viewers (in thousands) in 2015 in 2 different theatres



49. If out of the total number of viewers from both of the theatres in January, the ratio of male to female is 7 : 5 and out of the total number of viewers from both of the theaters in November, the ratio of male to female is 5 : 3 then male viewers from both of the theatres in January are approximately what percentage of the female viewers from both of the theaters in November ?
 (a) 200% (b) 246% (c) 150% (d) 220% (e) 225%
50. Find the ratio between the average number of viewers from January and July from theater A to the average number of viewer from July, September and November from theatre B ?
 (a) 7 : 5 (b) 5 : 7 (c) 10 : 13 (d) 13 : 10 (e) 12 : 11
51. If number of viewers of theatre A in January 2016 increases by 20% and of theatre B by 10% as compared to the corresponding no. of viewers of these theatres in January in 2015. Then find the difference between no. of viewers of theatre A and theatre B in January 2016.
 (a) 20000 (b) 22000 (c) 25000 (d) 26000 (e) 24500
52. The number of viewers of theatre B in October is equal to average number of the viewers of same theatre in September and November. Also the viewers of theatre A in October is $\frac{5}{7}$ of the viewers of theatre B in the same month. Find the number of viewers of theatre A in October.
 (a) 24000 (b) 22000 (c) 25000 (d) 20000 (e) 48000
53. The total number of viewers in March 2016 increased by 40% as compared to that in March 2015. If the viewers of theatre A in March 2016 are 25% more than that in 2015. Then find the difference between number of viewers of theatre B in March 2016 and in March 2015.
 (a) 15800 (b) 19800 (c) 17800 (d) 18800 (e) 18700

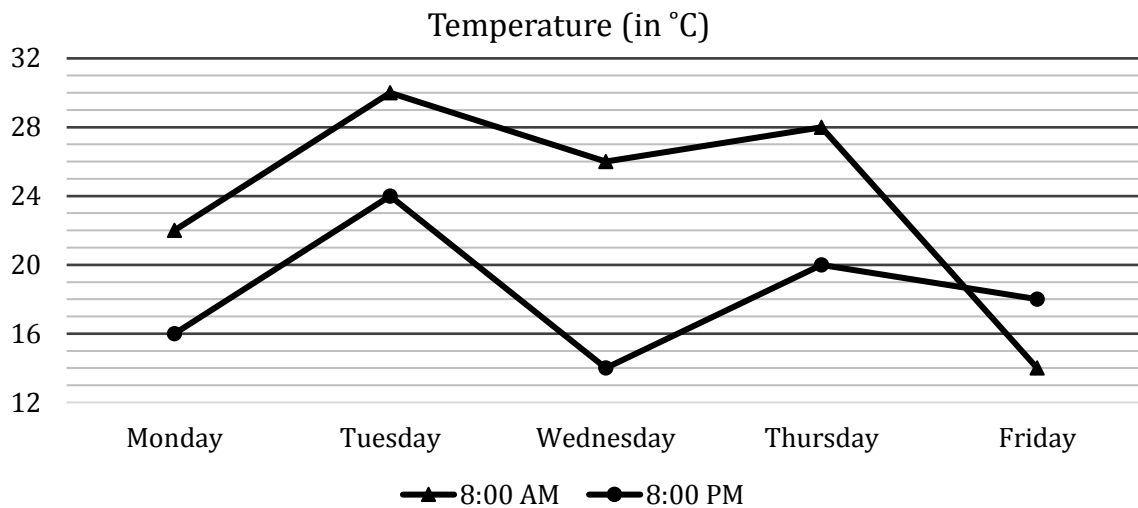
Direction (54–57): The given bar graph shows average weight of the employees of five different organizations when weights are arranged in descending order.



54. If there are 60 employees in the organization D and average weight of the employees is 60 kg, then maximum weight of the employee who is at 48th position.
 (a) 30 kg (b) 54 kg (c) 48 kg (d) 60 kg (e) 65 kg
55. For how many of the given organizations average weight of the remaining 60% of the employees of organization be more than 45 kg if average weight of all the employees for each of the organization is 50 kg.
 (a) 1 (b) 2 (c) 3 (d) 4 (e) 5

56. If in each of the organizations remaining employees has the highest possible average weight, then the 2nd highest average weight is for which organization?
 (a) A (b) B (c) C (d) D (e) E
57. Which of the following option can be the least possible average weight of any organization?
 (a) 32.4 kg (b) 32.6 kg (c) 32.2 kg (d) 30.8 kg (e) 31.4 kg

Directions (58 –62): Given line graph shows the temperature (in °C) of 5 different days at 8:00 AM & 8:00 PM. Read the information carefully and answer the questions.



NOTE: Consider only temperature at mentioned time.

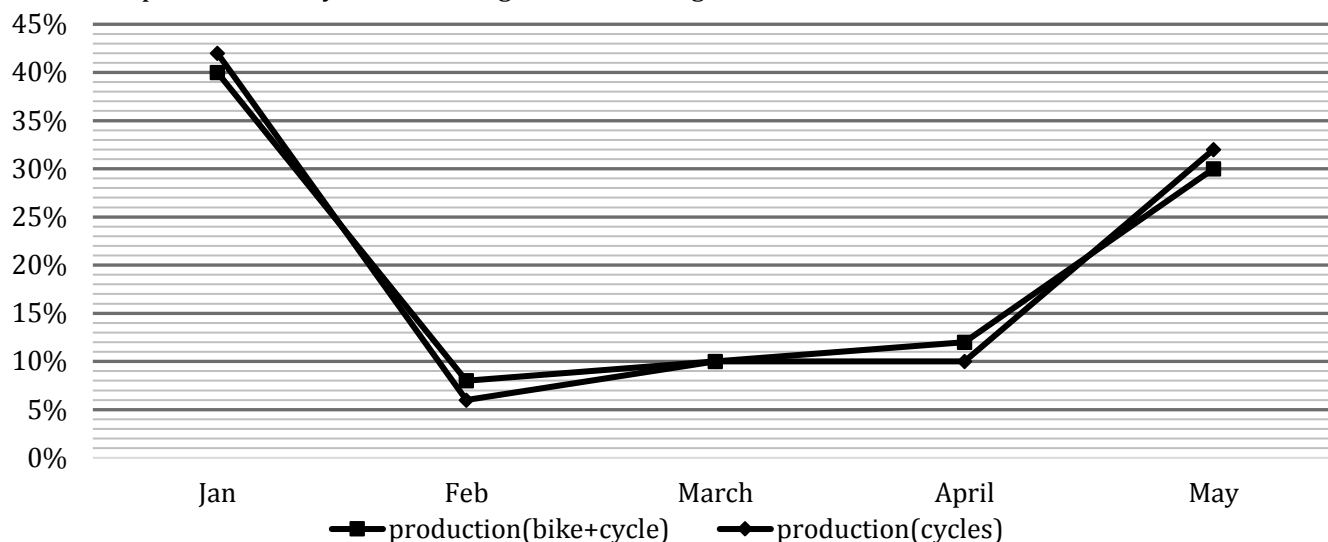
58. Which day has maximum & minimum average temperature respectively?
 (a) Friday & Tuesday (b) Tuesday & Friday (c) Tuesday & Monday
 (d) None of these (e) Wednesday & Tuesday
59. If temperature at 8:00 AM on Saturday is 20% more than that of on Tuesday and average night (8:00 PM) temperature of all 6 days (from Monday to Saturday) is 18°C then what is average temperature on Saturday?
 (a) 23°C (b) 29°C (c) 32°C (d) 26°C (e) 36°C
60. By what percent average of the average temperature on Monday & Tuesday is more/less than average temperature on Friday?
 (a) 63.33% (b) 49.75% (c) 50% (d) 45.67% (e) 43.75%
61. If difference between temperature at 8:00 AM on Friday & that of on Sunday is 7 °C while that of at 8:00 PM on Tuesday & that of on Sunday is 11 °C and average temperature on Sunday is 17 °C then what is the difference between temperature at 8:00 AM & 8:00 PM on Sunday?
 (a) 8 °C (b) 6 °C (c) 28 °C (d) 14 °C (e) 22 °C
62. What is ratio of difference of temperature at 8:00 AM on Wednesday & Friday and average of temperature at 8:00 PM on Tuesday & Thursday?
 (a) 3 : 11 (b) 6 : 11 (c) 10 : 11 (d) 20 : 11 (e) 3 : 1

Directions (63-67): Study the line charts given below and answer the following questions.

Line graph shows the percentage production (bikes + cycles) in five different months and percentage production of cycles in these five months.

Note-1. Total production of bikes and cycles in all the given months together=20000

2. Total production of cycles in all the given months together=15000



63. Find the ratio of Bikes produced in Jan and Feb together to cycles produced in March and April together?

- (a) 4: 5 (b) 3: 4 (c) 5: 6 (d) 2: 3 (e) 3: 2

64. If bikes produced in June are 50% more than that produced in May and cycles produced in June is 50% more than bikes produced in June, then find total bikes and cycles produced in June together are what percent of total cycles produced in May?

- (a) 94.75% (b) 94.25% (c) 93.25% (d) 93.75% (e) 92.75%

65. Bikes produced in March and April together are what percent more or less than that of total cycles and bikes together produced in these two months together?

- (a) $64\frac{7}{11}\%$ (b) $68\frac{2}{11}\%$ (c) $71\frac{5}{11}\%$ (d) $69\frac{1}{11}\%$ (e) $65\frac{5}{11}\%$

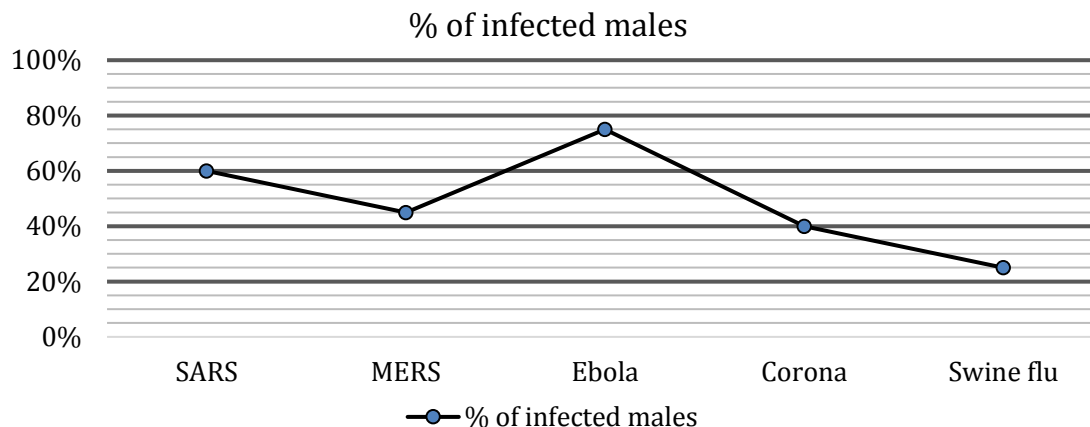
66. Difference between the average of bikes produced in Feb, March and April and average of cycles produced in Jan and May is how much more or less than bikes produced in Feb?

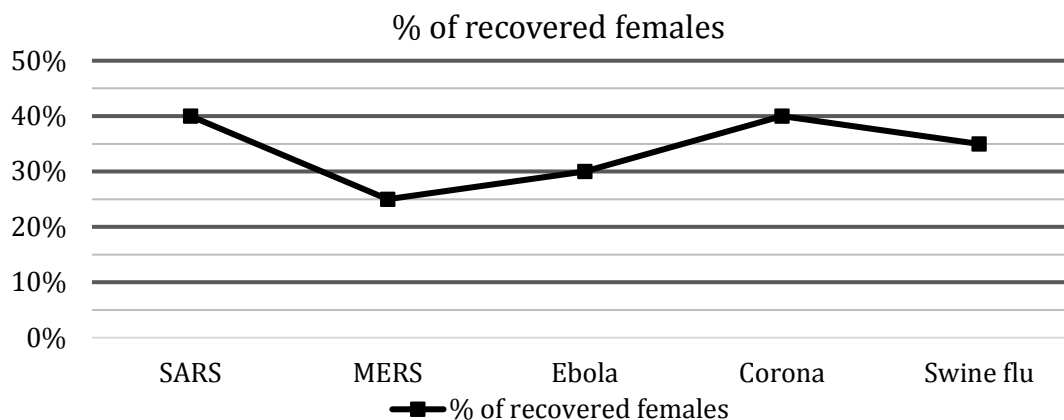
- (a) 4150 (b) 4050 (c) 4250 (d) 4450 (e) 4350

67. Cycles produced in Feb and May together are how much more or less than cycles produced in March and April together?

- (a) 2900 (b) 2200 (c) 2700 (d) 2500 (e) 1800

Directions (68-72): Line chart (I) shows the percentage of infected male out of total infected persons from five different types of diseases (SARS, MERS, Ebola, Corona and Swine flu) and Line chart (II) shows the percentage of female recovered out of total infected female from these five diseases. Study the line chart and bar chart given below carefully and answer the following questions.

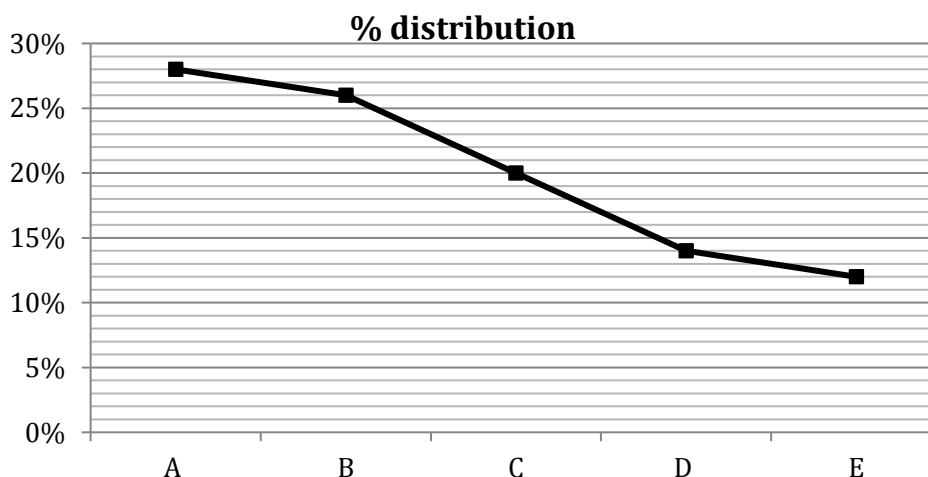


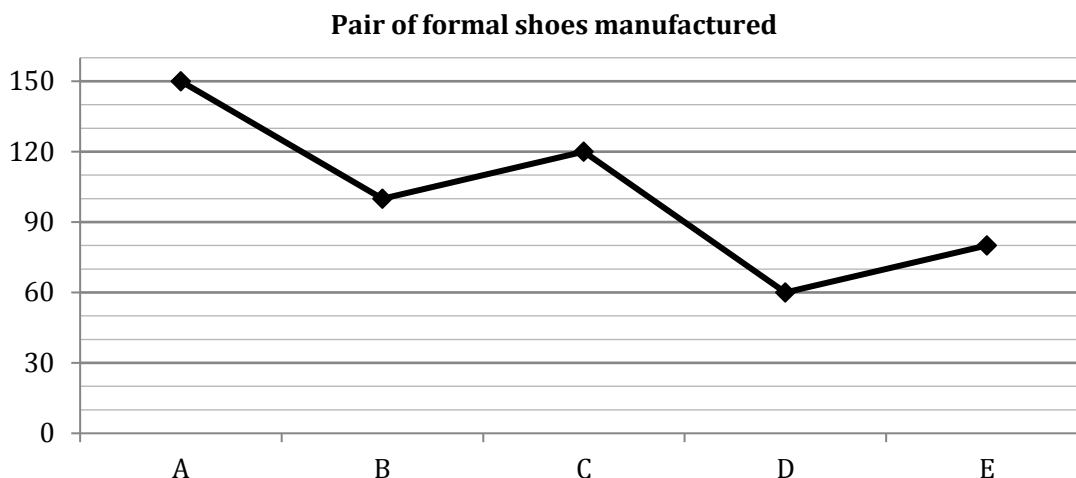


68. If number of recovered males from Swine flu is 135000 and ratio of recovered male to recovered female from Swine flu is 6:7, then find total number of infected persons from Swine flu.
 (a) 100000 (b) 600000 (c) 400000
 (d) Cannot be determined. (e) None of the above.
69. Number of males who have not recovered from SARS are 30000 and total number of males and females who recovered from SARS are 122000, then find maximum number of persons who got infected from SARS.
 (a) 458500 (b) 656500 (c) 762500
 (d) Cannot be determined. (e) None of the above.
70. Total recovered females from Ebola and Corona are 102000 and total infected persons from Ebola are 20% of total infected persons from Corona. If percentage of males recovered out of total infected males from Ebola and Corona are 80% and 75% respectively, then find number of males who have not recovered from Ebola and Corona together.
 (a) 28000 (b) 38000 (c) 48000 (d) 54000 (e) 52000
71. Recovered males from MERS are 5250 more than recovered females from MERS and females who have not recovered from MERS are $183\frac{1}{3}\%$ of males who have not recovered from MERS. Find total number of males infected from MERS.
 (a) 27000 (b) 33000 (c) 24000
 (d) Cannot be determined. (e) None of the above.
72. If number of females recovered from Corona are 120000 and percentage of males recovered out of total infected males from Corona is 30%, then find total persons who have not recovered from Corona.
 (a) 350000 (b) 480000 (c) 500000 (d) 320000 (e) 440000

Directions (74-76): Line chart (I) shows the percentage distribution of pairs of shoes manufactured by five different shoe manufacturers and line chart (ii) shows the number of pair of formal shoes manufactured by these manufacturers. Study the following pie line chart carefully to answer the following questions.

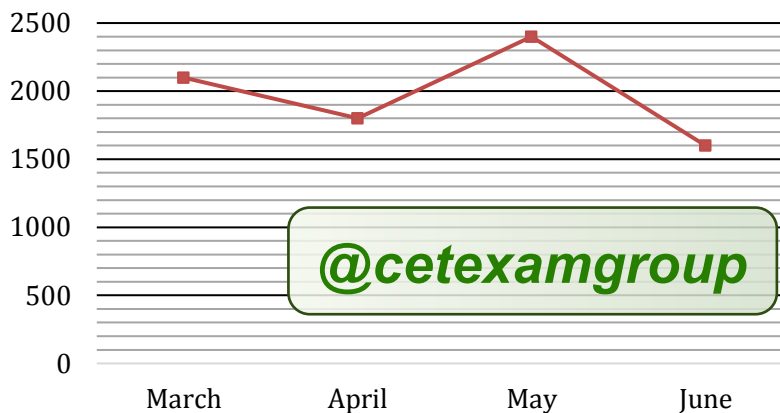
Note: Total pair of shoes manufactured = Total pair of formal shoes manufactured + Total pair of casual shoes manufactured.





73. Manufacturer-B sold all pair of shoes manufactured by him and he had earned 20% profit on selling all the pairs. Total revenue of manufacturer-B is Rs. 11856 and average cost of manufacturing one pair of formal shoes is Rs.26. If pair of shoes manufactured by manufacture-A is 280, then find average cost price of a pair of casual shoes for manufacturer-B.
 (a) Rs. 38.5 (b) Rs. 45.5 (c) Rs. 50.5 (d) Rs.62.5 (e) Rs.89.5
74. Number of pairs of casual shoes manufactured by manufacturer-A & B together is 310 more than the number of pairs of formal shoes manufactured by manufacturer-A & B together. Then, find difference in total pairs of shoes manufactured by manufacturer-E and manufacturer-C
 (a) 150 (b) 100 (c) 190 (d) 120 (e) 230
75. Average of number of pairs of shoes manufactured by all manufacturers is 280. Then, find pairs of casual shoes manufactured by manufacturer-A & E together is approximately what percent more or less than number of pairs of formal shoes manufactured by manufacturer-C & D together?
 (a) 95% (b) 81% (c) 74% (d) 89% (e) 83%.
76. Ratio of number of pairs of formal shoes to pairs of casual shoes manufactured by manufacturer-C is 4 : 5. Then, find ratio of total number of pairs of formal shoes manufactured by manufacturer-B, C and E together to pairs of casual shoes manufactured by manufacturer-A & D together.
 (a) 91 : 99 (b) 112 : 113 (c) 100 : 119 (d) 121 : 126 (e) None of the above.

Direction (77 – 80): Given below bar graph shows number of cycles manufactured by 'Hero' in four different months, while some information is given in paragraph. Read the data carefully and answer the questions.



Company must decide whether to take test of each manufactured units of cycle or not before sending it to showrooms. If company decides to test, then it has two conditions. When company test in day the cost of testing is Rs. 40 per cycle but it

won't be able to detect 20% of defective cycles while when company test in night the cost of testing is Rs. 60 per cycle but it won't be able to detect 40% of defective cycles. Showrooms identified all defective cycles passed to them and company will give them one cycle free on the identification of every four defective cycles. Defective cycles found during testing (by company) are repaired at Rs. 80 per cycle. Note – Company passes each unit of cycle manufactured to showrooms in each month.

77. If in March month company decide to test all cycles in night and total cost of repairing is Rs. 25200, then find total defective cycles identified by showrooms in March is what percent of total cycles manufactured by company in May?
 (a) 6.75% (b) 5.75% (c) 9.75% (d) 8.75% (e) 8.25%
78. Company decides to test 70% of total manufactured cycles in day and rest in night in the month of April. If out of total cycles tested in day $6\frac{2}{3}\%$ cycles are identified defective by company and total repairing cost is Rs. 8880, then find total defective cycles identified by showrooms in April?
 (a) 39- (b) 36 (c) 29 (d) 37 (e) 32
79. If in the month of June company decide to test all cycles in night and total cost of repairing is Rs. 9600, then find how many cycles company must give free to showrooms?
 (a) 15 (b) 20 (c) 24 (d) 36 (e) 48
80. If in month of May company decide to test all cycles in day and showrooms got 30 free cycles for identifying the defective cycles, then find percentage of defective cycles in month of May?
 (a) 15% (b) 10% (c) 35% (d) 20% (e) 25%

Practice MCQs for Mains_(Solutions)

1. **(d):** total volume sold on Thursday = $(122 - 102) = 20 \text{ m}^3 = 20000 \text{ lit}$
 Amount earned = $20000 \times 75 = \text{Rs. } 1500000 = \text{Rs. } 15 \text{ lakh}$
2. **(e):** amount of oil sold on Monday & Tuesday
 $= (150 - 141) + (141 - 134) = 16 \text{ m}^3$
 Amount sold on all days together = $(150 - 141) + (141 - 134) + (134 - 122) + (122 - 102) = 48 \text{ m}^3$
 Average amount of oil sold on all days
 $= \frac{48}{4} = 12 \text{ m}^3$
 Required % = $\frac{16-12}{12} \times 100 = 33\frac{1}{3}\%$
3. **(e):** total earning = $[(150 - 141) \times 85 + (141 - 134) \times 90 + (134 - 122) \times 90 + (122 - 102) \times 75] \times 10^3$
 $= (9 \times 85 + 7 \times 90 + 12 \times 90 + 20 \times 75) \times 10^3 = 3975000 = \text{Rs. } 39.75 \text{ lakh}$
4. **(b):** sale on Friday = $(122 - 102) \times \frac{90}{100} = 18 \text{ m}^3$
 Price on Friday = $75 \times \frac{120}{100} = \text{Rs. } 90 \text{ per litre}$
 Earning on Wednesday & Friday = $[(134 - 122) \times 90 + (18 \times 90)] \times 10^3 = \text{Rs. } 27 \text{ lakh}$
 Earning on Monday, Tuesday & Thursday = $[(150 - 141) \times 85 + (141 - 134) \times 90 + (122 - 102) \times 75] \times 10^3 = \text{Rs. } 28.95 \text{ lakh}$
 Required ratio = $\frac{27.00}{28.95} = 2700:2895 = 540:579$
5. **(c):** earning on Friday
 $= 18 \times 90 \times 10^3 = \text{Rs. } 16.2 \text{ lakh}$
 Earning on Monday
 $= (150 - 141) \times 85 \times 10^3 = \text{Rs. } 7.65 \text{ lakh}$
 Earning on Tuesday
 $= (141 - 134) \times 90 \times 10^3 = \text{Rs. } 6.3 \text{ lakh}$
 Earning on Wednesday
 $= (134 - 122) \times 90 \times 10^3 = \text{Rs. } 10.8 \text{ lakh}$
 Earning on Thursday
 $= (122 - 102) \times 75 \times 10^3 = \text{Rs. } 15 \text{ lakh}$
 Total earning
 $= 7.65 + 6.3 + 10.8 + 15 + 16.2 = \text{Rs. } 55.95 \text{ lakh}$
 Average earning = $\frac{55.95}{5} = \text{Rs. } 11.19 \text{ lakh}$
 Required answer = 2 days
 Therefore, earning of 2 days i.e. Friday and Thursday exceeds average earning of the week
6. **(a):** let Maruti & Hyundai cars be $400x$ & $300x$ respectively
 Sedan cars of Maruti = $\frac{40}{100} \times 400x = 160x$
 Hatchback cars of Hyundai = $\frac{40}{100} \times 300x = 120x$
 Required % = $\frac{160x-120x}{120x} \times 100 = 33\frac{1}{3}\%$
7. **(d):** let total cars of Maruti, Hyundai, Tata & Honda be $400x, 300x, 500x, 200x$ respectively
 ATQ, $\frac{45}{100} \times 400x + \frac{40}{100} \times 300x = 50 + \frac{50}{100} \times 500x$
 $180x + 120x = 50 + 250x$
 $x = 1$
 required difference

$$= \frac{40}{100} \times 500 - \frac{25}{100} \times 200 = 150$$

8. (c): let total cars of Tata & Honda be $100x$ & $100y$ respectively

$$\text{ATQ, } 100x + 100y = 700$$

$$x + y = 7 \dots\dots\dots(i)$$

$$\frac{10}{100} \times 100x = \frac{25}{100} \times 100y$$

$$10x = 25y$$

$$x : y = 5 : 2 \dots\dots\dots(ii)$$

from (i) & (ii)

$$x = 5, y = 2$$

$$\text{Sedan cars of Tata} = \frac{40}{100} \times 100x = 200$$

9. (e): let total cars of Maruti, Hyundai & Honda be $100x$, $100y$ & $100z$ respectively

$$\text{ATQ, } \frac{15}{100} \times 100x = 2 \times \frac{10}{100} \times 100y$$

$$15x = 20y$$

$$x : y = 4 : 3 \dots\dots\dots(i)$$

$$100y = \frac{150}{100} \times 100z = 150z$$

$$y : z = 3 : 2 \dots\dots\dots(ii)$$

from (i) & (ii)

$$x : y : z = 4 : 3 : 2$$

$$\text{required ratio} = \frac{45+40}{100} \times 100x : \frac{50+25}{100} \times 100z$$

$$= 85x : 75z$$

$$= 17 \times 4 : 15 \times 2 = 34 : 15$$

10. (b): let total cars of Tata & Honda be $100x$ & $100y$ respectively

$$\text{ATQ, } \frac{10}{100} \times 100x = \frac{25}{100} \times 100y$$

$$10x = 25y$$

$$x : y = 5 : 2$$

$$x = 5k \text{ \& } y = 2k \text{ (let)}$$

$$\text{total Tata cars} = 100x = 500k$$

$$\text{total Honda cars} = 100y = 200k$$

$$\text{required \%} = \frac{500k-200k}{500k} \times 100 = 60\%$$

11. (a): let total cars of Maruti & Hyundai be $100x$ & $100y$ respectively

$$\text{ATQ, } \frac{45}{100} \times 100x + \frac{40}{100} \times 100y : \frac{15}{100} \times 100x +$$

$$\frac{10}{100} \times 100y = 10 : 3$$

$$(45x + 40y) : (15x + 10y) = 10 : 3$$

$$135x + 120y = 150x + 100y$$

$$15x = 20y$$

$$x : y = 4 : 3$$

$$x = 4k \text{ \& } y = 3k \text{ (let)}$$

Also,

$$\frac{15}{100} \times 100x - \frac{10}{100} \times 100y = \text{divisible by 2 \& 5} =$$

divisible by 10

$$15x - 10y = 30k \text{ which is divisible by 10 which}$$

$$\text{implies } k \neq \frac{1}{10}$$

$$\text{required difference} = \frac{40}{100} \times 100x - \frac{50}{100} \times 100y =$$

$$40x - 50y$$

$$= 160k - 150k = 10k$$

Since $k \neq \frac{1}{10}$, so required difference should be divisible by 10

Satisfying values (B) (D) (F)

12. (a): Let total people visited office P & office Q be 'a' & 'b' respectively

ATQ -

$$a \times \frac{40}{100} \times \frac{75}{100} = 1800$$

$$\frac{3a}{10} = 1800$$

$$a = 6000$$

$$\text{Also, } b \times \frac{40}{100} \times \frac{64}{100} = 1280$$

$$b = 5000$$

$$\text{Required ratio} = a : b = 6000 : 5000 = 6 : 5$$

13. (d): Let total number of people visited office Q = x

$$\text{So, } x \times \frac{60}{100} \times \frac{60}{100} = 2880$$

$$x = 8000$$

Total female applying for new 'Driving license' in

$$Q = 8000 \times \frac{40}{100} \times \frac{40}{100} = 1280$$

Let total number of people visited office R = y

$$\text{So, } y \times \frac{45}{100} \times \frac{58}{100} - y \times \frac{55}{100} \times \frac{30}{100} = 384$$

$$y = 4000$$

Total female applying for new 'Driving license' in

$$R = 4000 \times \frac{45}{100} \times \frac{42}{100} = 756$$

$$\text{Required difference} = 1280 - 756 = 524$$

14. (b): Let total number of people visited office S = r

ATQ -

$$r \times \frac{45}{100} \times \frac{50}{100} = 2250$$

$$r = 10000$$

$$\text{Required difference} = 10000 \times \frac{55}{100} \times \left(\frac{7}{10} - \frac{3}{10} \right) = 2200$$

15. (d): Let people visited office P = a

ATQ -

$$a \times \frac{40}{100} \times \left(\frac{75}{100} - \frac{25}{100} \right) = 1200$$

$$a = 6000$$

Let total people visited office S = b

$$b \times \frac{45}{100} \times \frac{50}{100} = 2700$$

$$b = 12000$$

Total people applying for new 'Driving license' in

$$S = 12000 \times \frac{55}{100} = 6600$$

$$\text{Required percentage} = \frac{6600 - 6000}{6600} \times 100$$

$$= 9 \frac{1}{11} \%$$

16. (c): Total number of students who did not belongs to 'SC' category from IIT DELHI and IIT MADRAS in the years 2016 & 2017 respectively
 $= 360 \times \frac{8}{9} + 420 \times \frac{6}{7}$
 $= 320 + 360$
 $= 680$

17. (b): Total boys take admission in IIT MADRAS in the year 2016
 $= 480 \times \frac{5}{6} = 400$
 Required percentage $= \frac{420-400}{420} \times 100$
 $= 4 \frac{16}{21} \%$

18. (d): Average number of students take admission in IIT KANPUR in the both years
 $= \frac{460+340}{2}$
 $= \frac{800}{2} = 400$
 Average number of students take admission in IIT GUHAWATI in the both years
 $= \frac{300+160}{2} = \frac{460}{2} = 230$
 Required difference $= 400 - 230 = 170$

19. (e): Total students take admission in the year 2016 belongs to general category in IIT DELHI
 $= 360 \times \frac{50}{100} = 180$
 Total students take admission in the year 2017 belongs to OBC category in IIT DELHI
 $= 220 \times \frac{25}{100}$
 $= 55$
 Required percentage $= \frac{180-55}{180} \times 100$
 $= 227 \frac{3}{11} \%$

20. (d): Total boys passed in 2011 $= (380 - 160) \times \frac{9}{11} \times \frac{60}{100} = 108$
 Total boys passed in 2011 $= (280 - 140) \times \frac{5}{7} \times \frac{72}{100} = 72$
 Total boys in 2011 & 2014 $= 108 + 72 = 180$
 Required ratio $= \frac{150}{180} = 5 : 6$

21. (a): Total students in college 'X' in 2016 $= 320 \times \frac{125}{100} = 400$
 Total students in college 'Y' in 2016 $= 400 \times \frac{140}{100} = 560$
 Let total girls in college 'X' & college 'Y' is a & b respectively
 So, total boys in college 'X' & college 'Y' is $(400 - a)$ & $(560 - b)$ respectively
 ATQ –
 $a + b = 540$ ----- (i)

Also, $(400 - a) - (560 - b) = 20$

$-a + b = 180$ ----- (ii)

From (i) & (ii) we get $a = 180$, $b = 360$

Total boys in college 'Y' $= 560 - 360 = 200$

Total amount boys paid in college 'B' as annual fee
 $= 24$ lakh

22. (b): Let total students in college in 2016 & 2017 be x & y respectively.

$$150 + \frac{60x}{100} + \frac{70y}{100} = 600$$

$$60x + 70y = 45000$$
 ----- (i)

$$\text{While, } (320 - 150) + \frac{30y}{100} - \frac{40x}{100} = 100$$

$$-40x + 30y = -7000$$
 ----- (ii)

From (i) & (ii) we get, $x = 400$, $y = 300$

$$\text{Total boys in 2017} = 300 \times \frac{30}{100} = 90$$

$$\text{Total boys in 2016} = 400 \times \frac{40}{100} = 160$$

$$\text{Required percentage} = \frac{160-90}{160} \times 100$$

$$= 43.75\%$$

23. (d): Total boys in 2011 $= (380 - 160) = 220$

$$\text{Total boys in 2012} = (350 - 220) = 130$$

$$\text{Total boys in 2013} = (360 - 200) = 160$$

$$\text{Total boys in 2014} = (280 - 140) = 140$$

$$\text{Total boys in 2015} = (320 - 150) = 170$$

$$\text{Average number of boys in the given years in college} = \frac{(220+130+160+140+170)}{5}$$

$$= \frac{820}{5} = 164$$

$$\text{Required percentage} = \frac{164-160}{160} \times 100$$

$$= 2.5\%$$

$$\text{24. (a): Required ratio} = \frac{90000 - 50000}{90000 - 80000} = 4 : 1$$

$$\text{25. (e): Required percentage}$$

$$= \frac{(80000 - 65000) + (85000 - 65000)}{65000 + 65000} \times 100 = 26.92 \approx 27\%$$

26. (c): Profit in 2014, 2015, 2017, 2018

Average profit

$$= \frac{(90000+80000+85000+90000) - (50000+65000+65000+80000)}{4}$$

$$= \text{Rs.} 21250$$

Loss in 2016, 2019

$$\text{Average loss} = \frac{(85000+80000) - (80000+70000)}{2} =$$

$$\text{Rs.} 7500$$

$$\text{Required difference} = 21250 - 7500 = \text{Rs.} 13750$$

27. (b): Required percent

$$= \frac{(50000+65000+85000+85000+80000) - (10000+5000+15000+10000+5000+15000)}{50000+65000+85000+85000+80000+80000}$$

$$\times 100$$

$$= \frac{365}{425} \times 100 = 85.88 \approx 86\%$$

- 28. (d):** Average expenditure

$$= \frac{50000+65000+85000+65000+80000+80000}{6}$$

$$= \text{Rs. } 70833.33$$
Other expenditure in 2014 = 50000 - 10000 = Rs. 40000
Other expenditure in 2015 = 65000 - 5000 = Rs. 60000
Other expenditure in 2016 = 85000 - 15000 = Rs. 70000
Other expenditure in 2017 = 65000 - 10000 = Rs. 55000
Other expenditure in 2018 = 80000 - 5000 = Rs. 75000
Other expenditure in 2019 = 80000 - 15000 = Rs. 65000

- 29. (b):** Let total manufactured cycles by S & T is 'a' & 'b' respectively

We have to find 'a - b'

From I –

$$a \times \frac{72}{100} - b \times \frac{50}{100} = 1280$$

$$72a - 50b = 128000$$

From II –

$$a \times \frac{40}{100} - b \times \frac{40}{100} = 3200$$

$$0.4a - 0.4b = 3200$$

$$a - b = 8000$$

Hence, Statement (II) alone is sufficient to answer the question but statement I is not sufficient to answer the question

- 30. (e):** Let total manufactured cycles by R be 'x'

ATQ –

$$\frac{0.44x + 0.52x}{2} = 7680$$

$$x = \frac{7680 \times 2}{0.96}$$

$$x = 16000$$

Total cycles manufactured by P

$$= 1.4 \times 16000 = 22400$$

$$\text{Required difference} = 22400 \times \frac{60}{100} - 22400 \times$$

$$\frac{50}{100} = 2240$$

- 31. (d):** Let total manufactured cycles by Q = y

From I –

$$0.6y - 0.4y = 6400$$

$$0.2y = 6400$$

$$y = 32000$$

$$\text{Stocks added by Q for 2017} = 32000 \times \frac{40}{100} \times \frac{37.5}{100} = 4800$$

From II –

$$0.6y - 0.4y = 6400$$

$$0.2y = 6400$$

$$y = 32000$$

$$\text{Stocks added by Q for 2017} = 32000 \times \frac{40}{100} \times \frac{37.5}{100} = 4800$$

Either statement (I) or statement (II) is sufficient to answer the question

- 32. (d):** Let total cycles by R in 2016 & T in 2017 is 3x & 4x respectively

ATQ –

$$4x \times \frac{50}{100} - 3x \times \frac{56}{100} = 192$$

$$2x - 1.68x = 192$$

$$x = 600$$

Total unsold cycles which manufactured by S in

$$2017 = 4 \times 600 \times \frac{60}{100} + 3 \times 600 \times \frac{44}{100} = 2232$$

Total manufactured cycles by P in 2017 = 2232

$$\times \frac{100}{40} \times \frac{100}{75} = 7440$$

Total number of unsold cycles by P in 2017 = 7440

$$\times \frac{50}{100} = 3720$$

- 33. (b):** Let total cycles manufactured by T in 2017 or 2016 = 100x

So, total cycles manufactured by S in 2016 = 100x

$$\times 1.2 = 120x$$

$$120x \times \frac{72}{100} + 100x \times \frac{40}{100} = 2528$$

$$x = 20$$

Total unsold cycles by S & T in 2017 = 2000

$$\times \frac{50}{100} + 2400 \times \frac{40}{100}$$

$$= 1000 + 960$$

$$= 1960$$

- 34. (c):** By observation we can say that the sales volume of Manch is more in 2006 compared to 2007 and also 2010 and total sales volume is less in 2006 compared to 2007 and 2010. So the market share of Manch is not the highest for years 2007 and 2010. In the same way the market share of Manch is not the highest in 2009.

In the year 2006, market share of Manch

$$= \frac{350}{800} = \frac{7}{16}$$

In the year 2011, market share of Manch = $\frac{400}{950} =$

$$\frac{8}{19}$$

Since $\frac{7}{16}$ is more than $\frac{8}{19}$, then market share is the highest in 2006.

- 35. (c):** Given that profit percent

$$= \frac{\text{Sales revenue} - \text{Expenditure}}{\text{Expenditure}} \times 100$$

$$25 = \frac{(10 \times 200) \times 10^5 - \text{expenditure}}{\text{expenditure}} \times 100$$

$$\therefore \text{expenditure} = \text{Rs. } 16 \times 10^7 = \text{Rs. } 16 \text{ crore.}$$

- 36. (d):** We need the sales revenue and expenditure. Now we do not know the sales revenue as selling prices of the chocolates are not known. We cannot answer the question.

37. (a); Before doing the calculation to check if there is any possibility to answer the question by observation. By observation we can say that the sales of Tit-Tat in year 2010 are two times the sales of 2006, but for other companies, it is less than double. So the average annual growth rate is the highest for Tit-Tat from year 2006 to 2010.

38. (e); Required percent = $\frac{850-850}{850} \times 100 = 0\%$

39. (b); Total number of qualified student in year 2011 = $\frac{1210}{11} \times 20 = 2200$
Number of student who are not qualified in year 2011 = $\frac{45}{55} \times 2200 = 1800$

40. (d); Cannot be determined since percentage of qualified candidates and ratio of unqualified boys to girls from the year 2017 is not given.

41. (a); Let total number of student in year 2015 be 100
Then total number of student in year 2013 is 140
Required percentage = $\frac{140 \times 60 - 30 \times 100}{30 \times 100} \times 100 = 180\%$

42. (c); Total number of qualified student in year 2010 = $\frac{770}{35} \times 100 = 2200$
Total number of qualified student in year 2009 = $\frac{2200}{11} \times 7 = 1400$
Total number of student in year 2009 = $\frac{1400}{20} \times 100 = 7000$
Total number of student in year 2010 = $\frac{2200}{25} \times 100 = 8800$
 \therefore Required ratio = $\frac{7000}{8800} = 35 : 44$

43. (d); Total number of appeared student in year 2014 = $\frac{4200}{80} \times 100 = 5250$
Total number of unqualified student in year 2012 = $\frac{40}{100} \times 4200 = 1680$
Total number of unqualified student in year 2014 = $\frac{20}{100} \times 5250 = 1050$
Let the number of unqualified girls in year 2012 are x
 $\therefore 2.5x = 1680$
 $x = 672$
And,
Let the number of unqualified girls in year 2014 is y
 $\therefore 2.5y = 1050$
 $y = 420$
 \therefore Required total = $672 + (1050 - 420)$
 $= 672 + 630 = 1302$

44. (e); Let total voter of village C = x
And total voter of village D = y

$$\frac{85}{100}x - \frac{85}{100}x \times \frac{80}{100} = 3740$$

$$\frac{17}{20}x \left(1 - \frac{4}{5}\right) = 3740$$

$$x = 22000$$

$$\frac{75}{100}y + \frac{75}{100}y \times \frac{5}{100}y = 9450$$

$$\frac{3}{4}y \left(1 + \frac{1}{20}\right) = 9450$$

$$y = 12000$$

$$\text{Required sum} = 12000 + 22000 = 34000$$

45. (b); Let total voters from village E = 70000x
And total voters from village B = 90000x
Votes polled in E = 66,500x
Invalid votes in E = 9975x
Invalid votes cast by females in village E = $\frac{3}{7} \times 9975x = 4275x$
Votes polled in B = $900x \times 90 = 81000x$
Invalid votes in B = $810x \times 10 = 8100x$
Males who cast invalid votes in B = $\frac{3}{5} \times 8100x = 4860x$
Required percentage = $\frac{4275x}{4860x} \times 100 \approx 88\%$

46. (c); Let total voters in A = 10000x
According to question
Total valid votes in A = 5200x
 $\frac{5}{100} \times 5200x = 390$
 $260x = 390$
 $x = \frac{3}{2}$
total voters = 15000

47. (a); Let total votes polled = x
So $\frac{15}{100}x = 1350$
 $x = 9000$
Total voters from village D = $9000 \times \frac{100}{75}$
 $= 12000$
Total voters in E = $\frac{12000}{6} \times 7 = 14000$
Total valid votes polled in E = $140 \times 95 \times \frac{85}{100} = 11,305$

48. (d); Since we cannot determine number of males and females who vote so value cannot be determined

49. (b); Male viewers from both the theatres in January = $\frac{7}{12} \times 60,000 = 35000$
female viewers from both the theatres in November = $\frac{3}{8} \times 38000 = 14250$
 \therefore Required percentage = $\frac{35000}{14250} \times 100 \approx 246\%$

50. (d); Required Ratio = $\frac{(40+38)}{2} : \frac{(34+32+24)}{3}$
 $= 39 : 30 = 13 : 10$

51. (d); Required difference = $48000 - 22000 = 26000$

52. (d); No. of viewers of theatre A in October = $\frac{5}{7} \times \left(\frac{32+24}{2}\right) = 20$ thousand

53. (c); Total viewers in March 2016 = $\frac{140}{100} \times 72000 = 100800$

Viewers of theatre A in March 2016 = $\frac{125}{100} \times 44000 = 55000$

Viewers of theatre B in March 2016 = $100800 - 55000 = 45800$

Required difference = $45800 - 28000 = 17800$

54. (e); Total weight of all employees of Organization D = $60 \times 60 = 3600$ kg

Total weight of top 20% and bottom 20% employees.

$= (86 + 19) \times \frac{20 \times 60}{100} = 105 \times 12 = 1260$ kg

Total weight of other employees = $3600 - 1260 = 2340$ kg

Maximum possible weight of the employee who is at 48th position will be obtained only when the remaining of the employees will have equal weight.

Required possible weight = $\frac{2340}{36} = 65$.

55. (c); Average weight of 40% of employees for each organization

For A - $\frac{82 + 36}{2} = 59$

For B - $\frac{76 + 31}{2} = 53.5$

For C - $\frac{68 + 24}{2} = 46$

For D - $\frac{86 + 19}{2} = 52.5$

For E - $\frac{80 + 38}{2} = 59$

For A : Let remaining 60% of employees has average weight of x kg.

$\Rightarrow \frac{59 \times 2 + x \times 3}{5} = 50$

$\Rightarrow x = 44$ kg

For B : Let remaining 60% of employees had average weight of y kg

$\Rightarrow \frac{53.5 \times 2 + y \times 3}{5} = 50$

$\Rightarrow y = \frac{143}{3} = 47\frac{2}{3}$ kg

For C : Let remaining 60% of the employees has average weight of z kg

$\Rightarrow \frac{46 \times 2 + z \times 3}{5} = 50$

$\Rightarrow z = 52\frac{2}{3}$ kg

For D : Let remaining 60% of the employees has average weight of p kg.

$\Rightarrow \frac{52.5 \times 2 + p \times 3}{5} = 50 \Rightarrow p = 48\frac{1}{3}$ kg

For E : Let remaining 60% of the employees had average weight of q kg

$\Rightarrow \frac{59 \times 2 + q \times 3}{5} = 50$

$\Rightarrow q = 44$ kg.

So, required answer – B, C, D i.e. 3 organizations

56. (d): For every organization, highest possible average weight of remaining 60% of employees will be equal to average weight of top 20% employees.

For A :

Remaining employees (60%) has the highest possible average weight = 82 kg

So, average weight of the organization = $\frac{82 \times 4 + 36}{5} =$

72.8 kg

For B : average weight of the organization = 67 kg

For C : average weight of the organization = 59.2 kg

For D : average weight of the organization = 72.6 kg

For E : average weight of the organization = 71.6 kg

57. (a): For every organization, least possible average weight will be calculated when average weight of remaining 60% of employees is equal to average weight of bottom 20% of the employees.

The least possible average weight of A

$= \frac{82 + 4 \times 36}{5} = 45.2$ kg

For B : least possible average weight = 40 kg

For C : least possible average weight = 32.8 kg

For D : least possible average weight = 32.4 kg

For E : least possible average weight = 46.4 kg

58. (b): average temperature,

Monday = 19°C

Tuesday = 27 °C (max)

Wednesday = 20 °C

Thursday = 24 °C

Friday = 16 °C (min)

59. (d): temperature at 8:00 AM on Saturday = 36 °C

Let temperature at 8:00 PM on Saturday be x °C

ATQ, $(16+24+14+20+18) + x = 108$

$x = 16$ °C

required average = $\frac{36+16}{2} = 26$ °C

60. (e): average temperature of Monday = 19 °C

Average temperature on Tuesday = 27 °C

Average temperature on Monday & Tuesday = 23 °C

Average temperature on Friday = 16 °C

Required % = $\frac{23-16}{16} \times 100 = 43.75\%$

61. (a): let temperature at 8:00 AM & 8:00 PM on Sunday be $x^{\circ}\text{C}$ & $y^{\circ}\text{C}$ respectively
 ATQ,
 $x = 14 \pm 7 = 21$ or 7
 $y = 24 \pm 11 = 35$ or 13
 also, $x + y = 34$
 which means $x = 21^{\circ}\text{C}$; $y = 13^{\circ}\text{C}$
 required difference = $21 - 13 = 8^{\circ}\text{C}$

62. (b): required ratio = $(26 - 14) : \left(\frac{24+20}{2}\right)$
 $= 6 : 11$

63. (a): Bikes produced in Jan and Feb together
 $= ((20,000 \times 0.4) - (15,000 \times 0.42))$
 $+ ((20,000 \times 0.08) - (15,000 \times 0.06))$
 $= (8,000 - 6,300) + (1,600 - 900)$
 $= 2,400$
 Cycles produced in March and April together =
 $15,000 \times 0.2$
 $= 3,000$
 Required ratio = $\frac{2400}{3000} = 4 : 5$

64. (d): Bikes produced in June = $1.5 \times ((20,000 \times 0.3) - (15,000 \times 0.32))$
 $= 1800$
 Cycles produced in June = $1800 \times \frac{3}{2} = 2700$
 Total Bikes and cycles produced in June = $1800 + 2700 = 4500$
 Total cycles produced in May = 4800
 Required % = $\frac{4500}{4800} \times 100 = 93.75\%$

65. (b): Bikes produced in March and April together
 $= ((20,000 \times 0.1) - (15,000 \times 0.1))$
 $+ ((20,000 \times 0.12) - (15,000 \times 0.1))$
 $= (2000 - 1500) + (2400 - 1500)$
 $= 1400$
 Total Bikes and cycles produced in March and April together
 $= 20,000 \times 0.22 = 4400$
 Required % = $\frac{4400 - 1400}{4400} \times 100 = 68\frac{2}{11}\%$

66. (a): Average of bikes produced in Feb, March and April
 $= \frac{1}{3} \times ((20,000 \times 0.3) - (15,000 \times 0.26))$
 $= 700$
 Average of cycles produced in Jan and May
 $= \frac{1}{2} \times (15,000 \times 0.74)$
 $= 5550$
 difference = $5550 - 700 = 4850$
 bikes produced in Feb = $20000 \times 0.8 - 15000 \times 0.6 = 700$
 required difference = $4850 - 700 = 4150$

67. (c): Required difference = $15,000 \times (0.38 - 0.2)$
 $= 2700$

68. (b): Number of recovered females from Swine flu =
 $135000 \times \frac{7}{6}$
 $= 157500$
 Total infected females from Swine flu = $157500 \times \frac{100}{35}$
 $= 450000$
 So, total number of infected persons from Swine flu = $450000 \times \frac{100}{100-25}$
 $= 600000$

69. Ans. (c): To find maximum number of persons who got infected from SARS can be calculated when all 122000 recovered persons from SARS are females.
 So,
 Total number of infected females from SARS
 $= 122000 \times \frac{100}{40}$
 $= 305000$
 And, total number of infected persons from SARS
 $= 305000 \times \frac{100}{100-60}$
 $= 762500$

70. (e): Let total infected persons from Corona be $100a$.
 So, total infected persons from Ebola = $\frac{20}{100} \times 100a$
 $= 20a$
 Now, total recovered females from Ebola
 $= 20a \times \frac{100-75}{100} \times \frac{30}{100}$
 $= 1.5a$
 And, total recovered females from Corona
 $= 100a \times \frac{100-40}{100} \times \frac{40}{100}$
 $= 24a$
 ATQ,
 $24a + 1.5a = 102000$
 $a = 4000$
 So, number of males who have not recovered from Ebola and Corona together = $\left(20 \times 4000 \times \frac{75}{100} \times \frac{100-80}{100}\right) + \left(100 \times 4000 \times \frac{40}{100} \times \frac{100-75}{100}\right)$
 $= 12000 + 40000 = 52000$

71. (a): Let total number of infected persons from MERS be $100m$.
 So, total number of infected males from MERS
 $= 100m \times \frac{45}{100} = 45m$
 And, total number of infected females from MERS
 $= 100m - 45m$
 $= 55m$
 Now, total number of females who recovered from MERS = $55m \times \frac{25}{100} = 13.75m$
 And, total number of females who have not recovered from MERS = $55m - 13.75m = 41.25m$

Now, let total number of males who recovered from MERS be y .

So, total number of males who have not recovered from MERS = $45m - y$

ATQ,

$$y - 13.75m = 5250 \dots(i)$$

$$\text{And, } \frac{41.25m}{45m - y} = \frac{550}{300}$$

$$247.5m = 495m - 11y$$

$$y = 22.5m \dots(ii)$$

Put value of y in (i):

$$m = 600$$

$$\text{So, required number of males} = 45m = 27000$$

72. (d): ATQ,

$$\text{Total infected females from Corona} = 120000 \times \frac{100}{40}$$

$$= 300000$$

And, total infected males from Corona

$$= 300000 \times \frac{40}{100 - 40} = 200000$$

And, total males recovered from Corona

$$= 200000 \times \frac{30}{100} = 60000$$

$$\text{Required number of persons} = (200000 - 60000) + (300000 - 120000) = 320000$$

73. (b): Cost Price of all pair of shoes manufactured by manufactures - B = $11856 \times \frac{100}{120}$ = Rs. 9880

Let cost price of 1 pair of casual shoes manufactured by manufacturer - B be Rs. 'x'

$$\text{Total pair of shoes manufactured by manufactures - B} = 280 \times \frac{100}{28} \times \frac{26}{100} = 260$$

ATQ,

$$100 \times 26 + x \times (260 - 100) = 9880$$

$$\Rightarrow x = \frac{9880 - 2600}{160} = 45.5 \text{ Rs.}$$

74. (d): Total pairs of shoes manufactured by manufacture - A & B together = $(150 + 100) + (150 + 100 + 310) = 810$

Total pairs of shoes manufactured by all 5 manufactures

$$= 810 \times \frac{100}{(28 + 26)} = 1500$$

$$\text{Required difference} = 1500 \times \frac{20}{100} - 1500 \times \frac{12}{100} = 300 - 180 = 120$$

75. (e): total number of pairs of shoes manufactured by all manufactures = $280 \times 5 = 1400$

Pairs of casual shoes manufactured by manufactures - A & E together

$$= \left(1400 \times \frac{28}{100} - 150\right) + \left(1400 \times \frac{12}{100} - 80\right) = 242 + 88 = 330$$

Pairs of formal shoes manufactured by manufactures - C & D together = $120 + 60 = 180$

$$\text{Required \%} = \frac{330 - 180}{180} \times 100$$

$$= \frac{150}{180} \times 100$$

$$= \frac{250}{3} \%$$

$$= 83.33\%$$

$$= 83\% \text{ (Approx..)}$$

76. (c): ATQ,

Pairs of Casual shoes manufactured by manufactures - C = $120 \times \frac{5}{4} = 150$

Total pairs of shoes manufactured by all manufactures = $(120 + 150) \times \frac{100}{20} = 1350$

Total pairs of formal shoes manufactured by manufactures - B, C & E together = $(100 + 120 + 80) = 300$

Total pairs of casual shoes manufactured by manufactures - A & D together

$$= \left(1350 \times \frac{28}{100} - 150\right) + \left(1350 \times \frac{14}{100} - 60\right) = 228 + 129 = 357$$

$$\text{Required ratio} = \frac{300}{357} = 100 : 119$$

77. (d): Total defective cycles identified during testing by company in March = $\frac{25200}{80} = 315$

Total defective units identified by showrooms in March = $315 \times \frac{40}{60} = 210$

$$\text{Required percentage} = \frac{210}{2400} \times 100 = 8.75\%$$

78. (a): Total defective cycles identified during testing by company in April = $\frac{8880}{80} = 111$

Total defective cycles identified by showrooms in April which are tested in day = $1800 \times \frac{70}{100} \times \frac{1}{15} \times \frac{20}{80} = 21$

Total defective cycles identified by showrooms in April which are tested in night = $(111 - 84) \times \frac{40}{60} = 18$

$$\text{Required sum} = 21 + 18 = 39$$

79. (b): Total defective cycles identified during testing by company in June = $\frac{9600}{80} = 120$

Total defective units identified by showrooms in June = $\frac{120}{60} \times 40 = 80$

$$\text{So, cycles company must give free to showrooms} = \frac{80}{4} \times 1 = 20$$

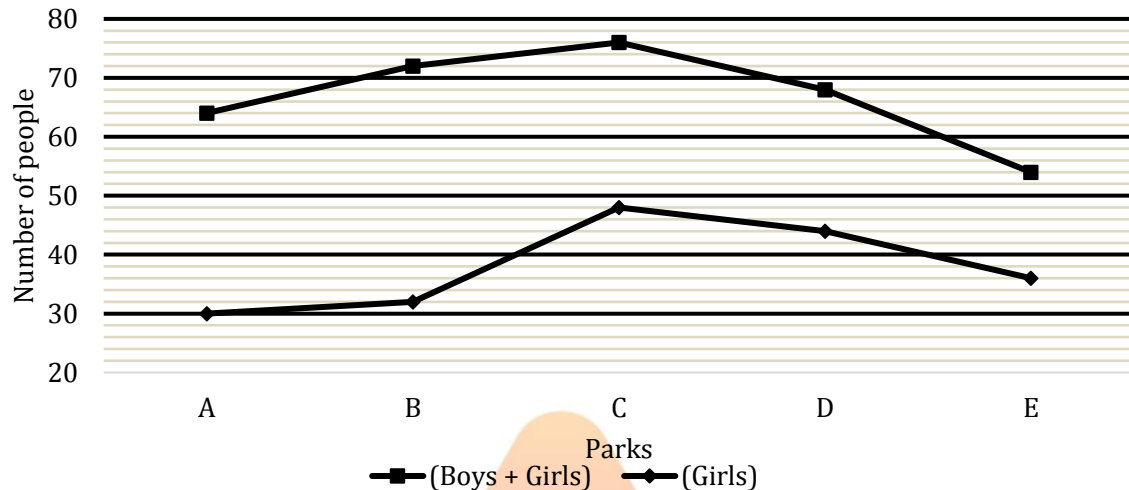
80. (e): Total defective cycles identified by showrooms in May = $30 \times 4 = 120$

$$\text{Total defective cycles in month of May} = 120 \times \frac{100}{20} = 600$$

$$\text{Percentage of defective cycles in month of May} = \frac{600}{2400} \times 100 = 25\%$$

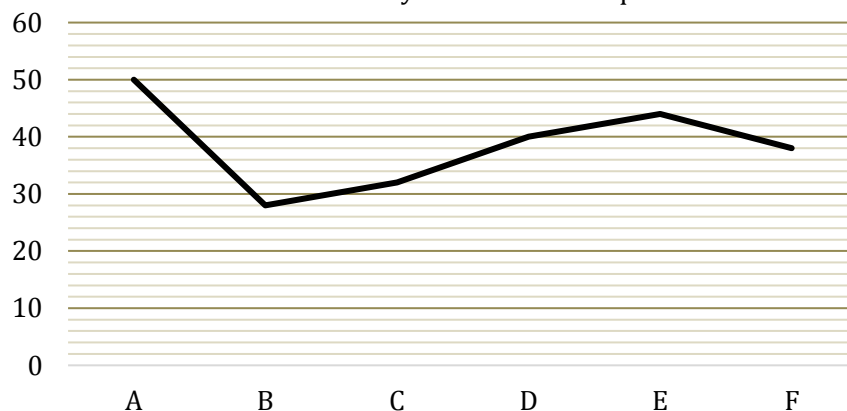
Previous Years' Questions of Prelims

Direction (1 – 5): The Line graph shows the number of people (Boys + girls) visited five (A, B, C, D & E) different parks and the number of girls visited out of total people visited these five parks. Read the data carefully and answer the questions.



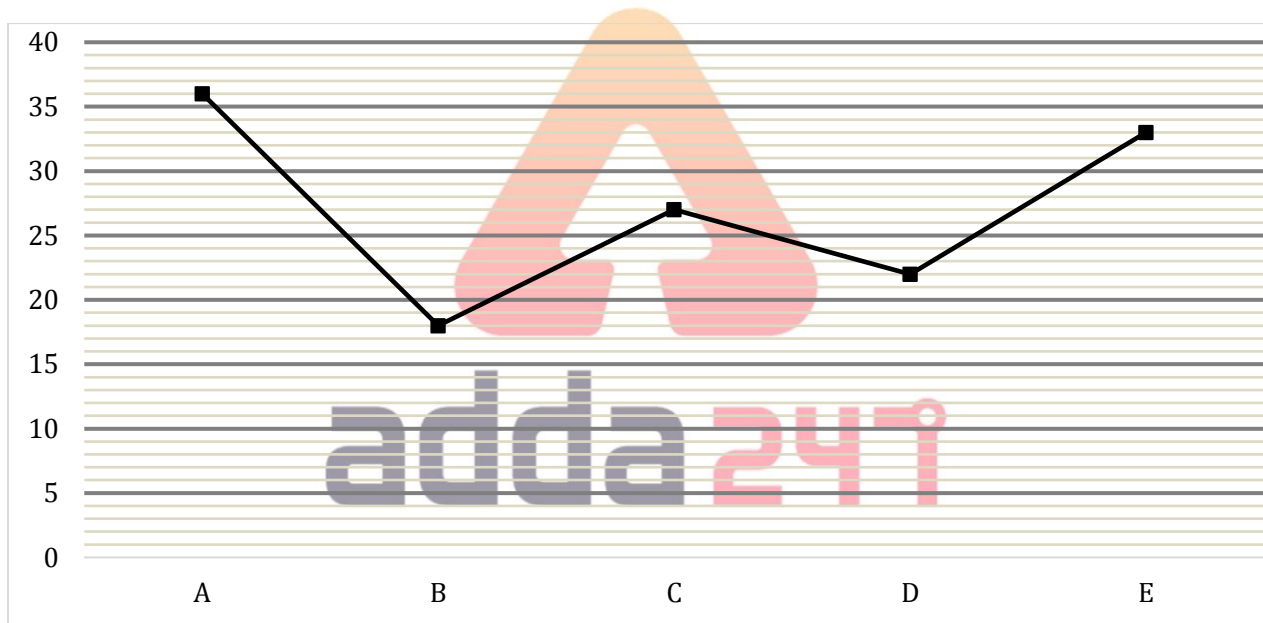
- Find total number of boys visited in park A, B & C together?
 (a) 104 (b) 102 (c) 106 (d) 108 (e) 96
- If total number of people visited in park F are 18 more than total number of people visited in park C and D together and out of total people visited in park F, $\frac{4}{9}$ th are girls, then find number of boys visited in park F?
 (a) 90 (b) 92 (c) 96 (d) 84 (e) 102
- What percent of girls visited in park A with respect to the total number of people (Boys + Girls) visited that park (approximately)?
 (a) 41% (b) 43% (c) 47% (d) 49% (e) 51%
- If park E charge Rs. 24 for each people (Boys + Girls) who visited the park, then find the total revenue get by park E?
 (a) 1166 Rs. (b) 1296 Rs. (c) 1248 Rs. (d) 1268 Rs. (e) 1284 Rs.
- Total people (Boys + Girls) who visited park B is what percent more than total people (Boys + Girls) who visited park E (Approximate)?
 (a) 25% (b) 39% (c) 43% (d) 33% (e) 66%

Direction (6 – 10): The line graph given below shows the total number of posts (Photos + Videos) shared by six (A, B, C, D, E & F) people in December 2019. Read the data carefully and answer the questions.



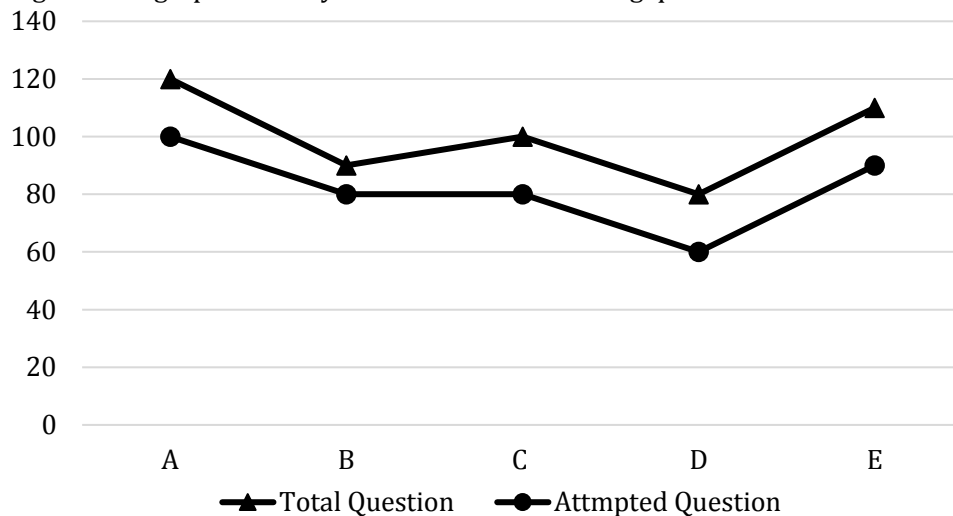
6. The total post shared by C is what percent less than the total post shared by D?
 (a) 20% (b) 25% (c) 15% (d) 10% (e) 30%
7. In January 2020 total posts shared by B & F is 12 and 15 more than previous month respectively, then find the total number of the post shared by B & F in January 2020?
 (a) 95 (b) 91 (c) 93 (d) 97 (e) 99
8. Find the average number of posts shared by A, C & F?
 (a) 42 (b) 48 (c) 40 (d) 36 (e) 44
9. Total photos shared by E is four more than total videos shared by him, then find total videos shared by E?
 (a) 24 (b) 20 (c) 28 (d) 22 (e) 30
10. If the ratio of total photos to total videos shared by B is 5: 9, then find total photos shared by B?
 (a) 10 (b) 18 (c) 12 (d) 14 (e) 16

Direction (11- 15): Line graph given below shows number of passengers travelling in five (A, B, C, D & E) different compartment of a trains. Read the data carefully and answer the questions.



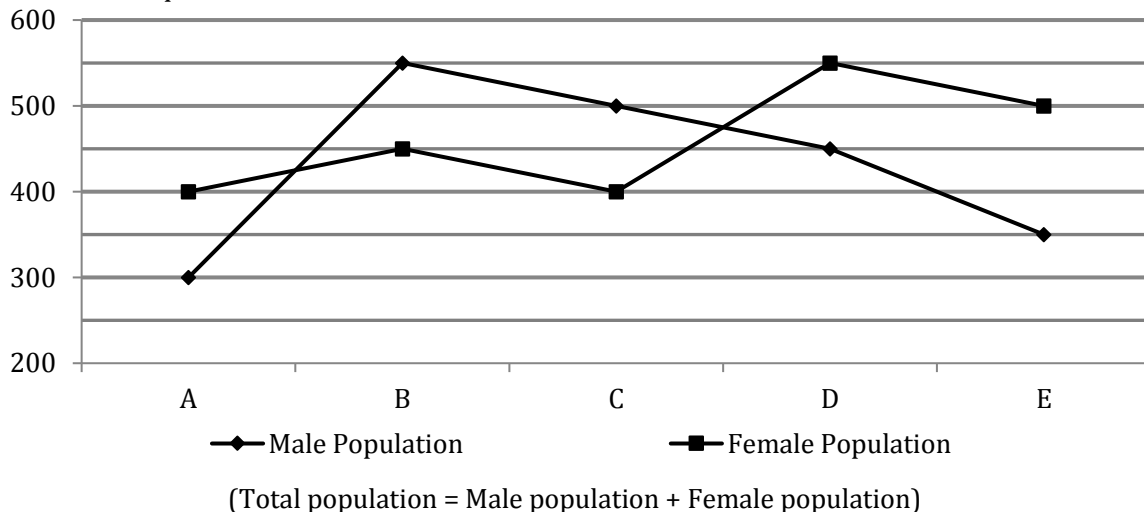
11. Total passengers in E are what percent less than total passengers in A?
 (a) $6\frac{1}{4}\%$ (b) $8\frac{1}{3}\%$ (c) $6\frac{1}{3}\%$ (d) $6\frac{2}{3}\%$ (e) 5%
12. Find average number of passengers in A, C & E?
 (a) 32 (b) 30 (c) 36 (d) 33 (e) 27
13. Find the ratio of total passenger in B to that of in D?
 (a) 7 : 9 (b) 9 : 10 (c) 11 : 9 (d) 9 : 13 (e) 9 : 11
14. Total passenger in C and E together are what percent more than total passenger in A?
 (a) $33\frac{1}{3}\%$ (b) $66\frac{2}{3}\%$ (c) $66\frac{1}{3}\%$ (d) 50% (e) 60%
15. Find total number of passengers traveling in B, C & D together?
 (a) 69 (b) 65 (c) 67 (d) 63 (e) 71

Direction (16 – 20): Line graph given below shows total number of questions in five papers and number of questions attempted. Study the given line graph carefully and answer the following questions.



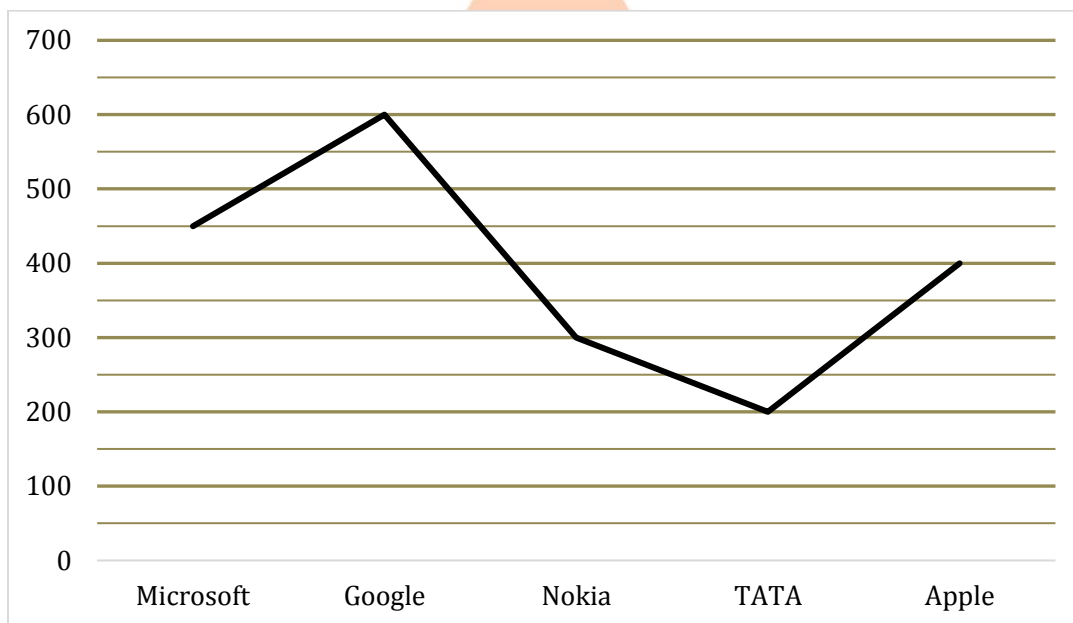
16. What is the average of difference between total question in A, C & D together and total questions attempted in same subjects?
 (a) 20 (b) 22 (c) 21 (d) 23 (e) 25
17. Total question not attempted by A and C together is what percent more or less than total question attempted by D.
 (a) 38% (b) 35% (c) $33\frac{1}{3}\%$ (d) 30% (e) $25\frac{1}{4}\%$
18. If 2 marks are awarded for each correct answer and 1 mark is deducted each wrong answer than what is the total marks obtained by E if he 20% questions attempted by him are wrong.
 (a) 125 (b) 126 (c) 124 (d) 121 (e) 122
19. What is the ratio of questions not attempted by B to C
 (a) 1: 2 (b) 2: 3 (c) 3: 4 (d) 4: 3 (e) 2: 1
20. 30% questions attempted by E are wrong and 15% questions attempted by B are wrong then find the sum of corrected questions attempted by B & E together.
 (a) 125 (b) 132 (c) 135 (d) 131 (e) 128

Directions (21-25):- Given line graph shows the data of male & female population in 5 different cities. Read the data carefully and answer the questions.



- 21.** By what percent total population of city A is more or less than that of city D?
 (a) 45% (b) 35% (c) 70% (d) 30% (e) 60%
- 22.** If in city A, the ratio of male graduates to female graduates is 3 : 4 and total graduates in the city are 70% of total population. Find population of females who are not graduate.
 (a) 120 (b) 50 (c) 90 (d) 70 (e) 135
- 23.** What is average of male population in all cities?
 (a) 465 (b) 455 (c) 440 (d) 460 (e) 430
- 24.** What percent of Female population in city C is male population in city E?
 (a) 90.2% (b) 87.5% (c) 84.5% (d) 85.5% (e) 114.2%
- 25.** In city B & C, ratio of postgraduates is 7 : 8. Total population who is postgraduate in city B is equal to total population of city A. find ratio of non-postgraduate population in city B to that of city C.
 (a) 7 : 3 (b) 8 : 3 (c) 7 : 1 (d) 3 : 1 (e) 8 : 1

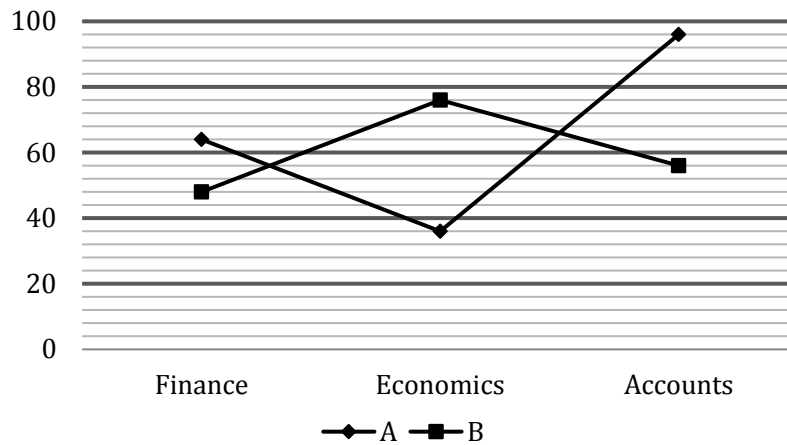
Directions (26-30) :- The line graph given below shows the no. of employees (in thousand) of 5 different companies viz. Microsoft, Google, Nokia, TATA, Apple in year 2018. Study the graph carefully and answer the following questions.



- 26.** What is the average no. of employee in all the companies?
 (a) 420000 (b) 390000 (c) 520000 (d) 430000 (e) 350000
- 27.** What is the ratio between no. of employee in Goggle and TATA together to that of Nokia and Apple together?
 (a) 21/10 (b) 15/16 (c) 8/7 (d) 4/3 (e) 13/14
- 28.** If number of employees in Reliance is 75% of no. of employees of Microsoft, find the no. of employee of Reliance.
 (a) 400000 (b) 375000 (c) 345000 (d) 337500 (e) 427500
- 29.** No. of employees in Google is what percentage of no. of employees in Apple?
 (a) 150% (b) 120% (c) 175% (d) 125% (e) 200%
- 30.** Number of employees in Microsoft is how much percentage more or less than number of employees of TATA?
 (a) 135% (b) 150% (c) 55.55% (d) 75.5% (e) 125%

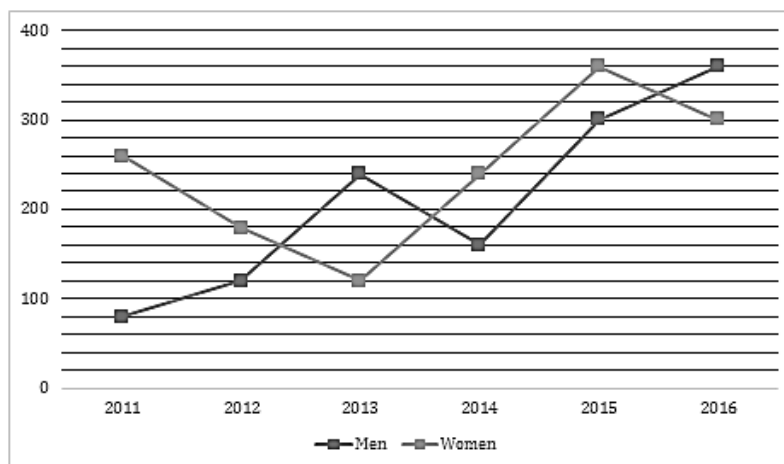
Directions (31-35): Study the line chart given below and answer the following questions.

Line chart shows the total questions viewed by 2 students (A & B) in 3 different subjects (Finance, Economics & Accounts). Total questions in each subject are 150.



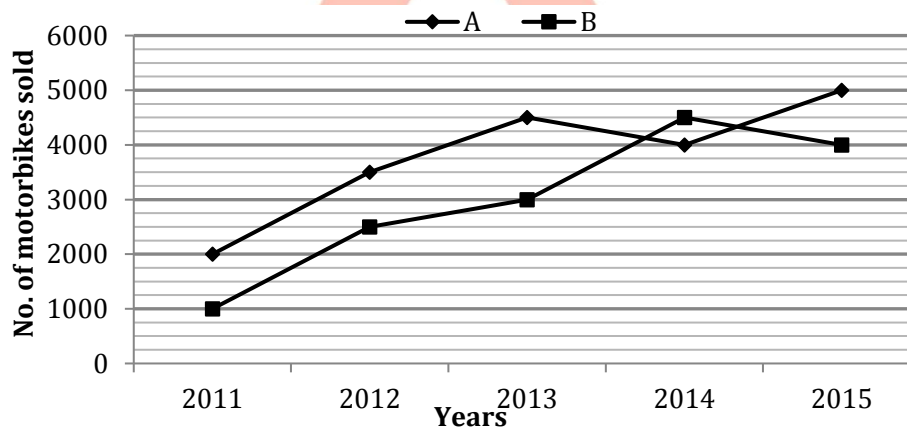
31. Viewed questions of B in Finance and Accounts together are what percent of unseen questions of A in Finance and Economics together?
 (a) 52% (b) 56% (c) 60% (d) 48% (e) 44%
32. Unseen questions of B in Economics and Accounts together are how much more or less than average viewed questions of A in Finance and Accounts?
 (a) 80 (b) 94 (c) 88 (d) 82 (e) 96
33. Find average number of unseen questions of B in Finance, Economics and Accounts.
 (a) 80 (b) 85 (c) 95 (d) 90 (e) 75
34. Unseen questions of A in Accounts are approximately what percent more or less than viewed questions of A & B together in Economics?
 (a) 22% (b) 42% (c) 52% (d) 12% (e) 32%
35. Unseen questions of A in Finance, Economics and Accounts together are how much more or less than unseen questions of B in Finance, Economics and Accounts together?
 (a) 46 (b) 26 (c) 16 (d) 56 (e) 36

Directions (36-40): Line chart given below shows number of labors (men and women) working in six different years. Study the data carefully and answer the following questions.



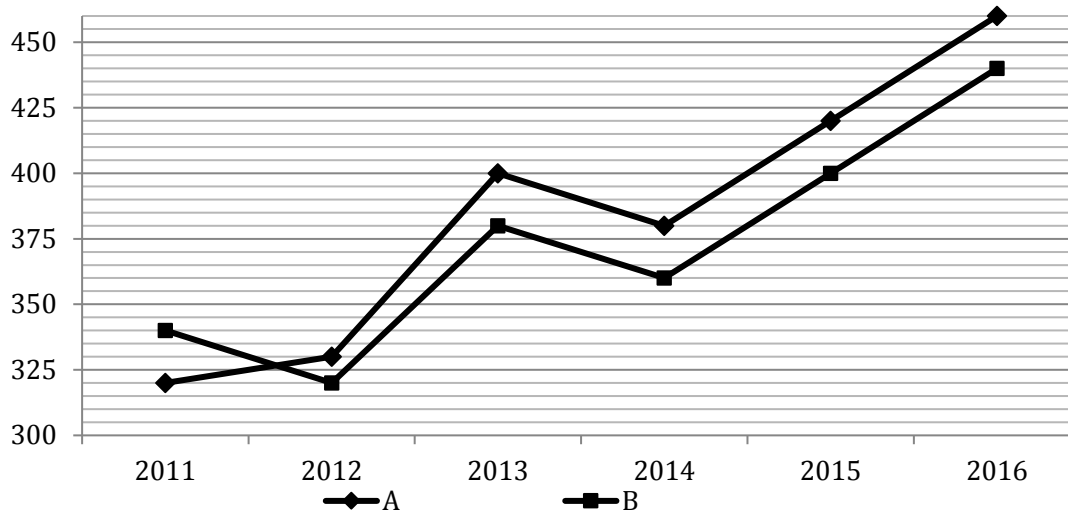
36. Total number of Men working in 2012 and 2013 together is what percent of the total number of labors (Men + Women) working in 2014?
 (a) 60% (b) 70% (c) 80% (d) 90% (e) 40%
37. Average number of Women working in 2014, 2015 and 2016 together is how much more/less than average number of Men working in 2011, 2014 and 2016 together?
 (a) 100 (b) 80 (c) 90
 (d) 70 (e) None of the given options
38. Number of Men working in 2017 is 15% more than that of 2015 while number of Women working in 2017 is 40% less than that of 2014. Find total number of labors (Men + Women) working in 2017?
 (a) 561 (b) 456 (c) 489 (d) 594 (e) 630
39. Find the ratio between total number of Labors working in 2012 and 2013 together to total number of labors working in 2015 and 2016 together?
 (a) 2 : 1 (b) 1 : 2 (c) 35 : 66
 (d) 11 : 10 (e) None of the given options
40. Total number of Men working in all six years is how much more/less than total number of Women working in all six years together?
 (a) None of the given options (b) 140 (c) 160
 (d) 180 (e) 200

Directions (41-45): Read the following line graph and answer the following questions given below it –
 There are two motorbike manufacturing companies A and B. The sale of motorbikes by these two different companies in different years is given in the graph below.



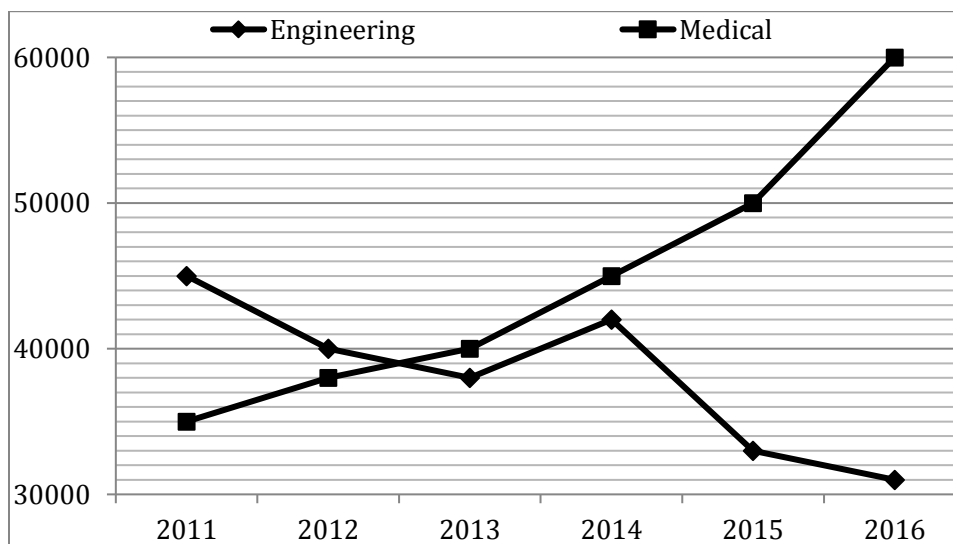
41. What is the ratio of total sales of company B in 2012 and that of company A in 2014 together to the total sales of company A in 2011 and that of company B in 2015 together?
 (a) 13:12 (b) 11:9 (c) 12:7 (d) 13:10 (e) None of these
42. What is the difference between the sales of company A in 2016 and that of company B in 2016 if the sales of company A and B increase by 20% and 10% respectively in 2016 as compared to 2015?
 (a) 1700 (b) 1600 (c) 1800 (d) 2100 (e) None of these
43. The total sales of both companies in 2015 is what percent more than the total sales of both the companies in 2011?
 (a) 280% (b) 180% (c) 200% (d) 250% (e) None of these
44. Find the difference between the total sales of company A from 2012 to 2014 and that of company B from 2013 to 2015?
 (a) 750 (b) 500 (c) 600 (d) 400 (e) None of these
45. If the sales of company A increases by 33.33% in 2011 over its sales in 2010, then find the percent increase in the sales of company A in 2015 with respect to the sales in 2010? (up to two decimal places)
 (a) 233.33% (b) 210.12% (c) 333.33% (d) 272.32% (e) None of these

Directions (46-50): The graph shows the no. of students in two classes A and B in five different years. Read the following graph and answer accordingly.



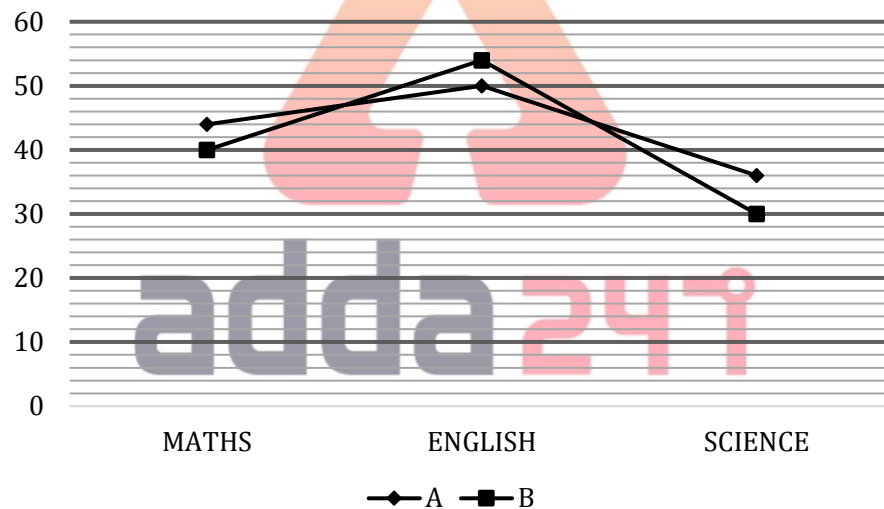
46. What is the average of difference between number of students through all these years in A and B?
 (a) 12.67 (b) 13.67 (c) 11.67 (d) 15 (e) None of these
47. Total number of students in 2012 and 2015 is what percent of the total number of students from A in all these years?
 (a) 63.6% (b) 65% (c) 70% (d) 62% (e) None of these
48. What is the ratio of Number of children in Class B for all the years to the total number of student in class A for all the years?
 (a) 31 : 33 (b) 32 : 35 (c) 32 : 33 (d) 29 : 33 (e) 33 : 35
49. What is the sum total of student for A in 2011, 2013 and total number of students in 2015 & 2016 for B?
 (a) 1560 (b) 1400 (c) 1500 (d) 1460 (e) None of these
50. Total students in class B for all the years is approximately what percent less than total no of students in both schools for all these years?
 (a) 55% (b) 58% (c) 60% (d) 50.8% (e) None of these

Directions (51 - 55): The graph shows the no. of graduates in two streams Engineering and Medical in Six different years. Read the following graph and answer accordingly.



51. What is the difference between the average number of graduates through all these years in ENGINEERING and MEDICAL?
 (a) 6600 (b) 6500 (c) 6000 (d) 6667 (e) None of these
52. Total number of graduates in 2013 and 2016 is approximately what percent of the total number of graduates from ENGINEERING in all these years?
 (a) 74% (b) 65% (c) 70% (d) 72% (e) None of these
53. What is the ratio of Number of Medical graduates for all the years to the total number of Engineering graduates for all these years?
 (a) 248 : 229 (b) 268 : 229 (c) 258 : 229 (d) 229 : 233 (e) 37 : 33
54. What is the sum of Engineering graduates in 2011, 2013 and Total Medical graduates in 2015 & 2016?
 (a) 15630 (b) 14300 (c) 19300 (d) 14600 (e) None of these
55. In which of the following years, No. of graduates in one stream is approximately 100% more than the no. of graduates in other stream?
 (a) 2016 (b) 2011 (c) 2015 (d) 2014 (e) 2012

Directions (56 – 60): Given below is the line graph which shows the marks obtained by two students A and B in three different subjects i.e. Maths, English, Science.



56. Average marks obtained by A and B in Maths is how much more than the average marks obtained by both in Science?
 (a) 11 (b) 9 (c) 7 (d) 8 (e) 10
57. Marks obtained by B in History is 12% more than marks obtained by A in English and marks obtained by B in Geography is 25% more than that of by him in Maths. Find the total marks obtained by B in History and Geography?
 (a) 104 (b) 112 (c) 98 (d) 106 (e) 108
58. If the maximum marks in each of the subjects is 100, then what percent marks are scored by A?
 (a) 43.33% (b) 45% (c) 48.66% (d) 35% (e) 46.67%
59. Total marks obtained by B in Maths and Science is what percent more than the marks obtained by A in English?
 (a) 25% (b) 40% (c) 45% (d) 55% (e) 30%
60. What is the ratio of total marks scored by A in Maths and Science to the total marks scored by B in English and Science?
 (a) 8:9 (b) 20:23 (c) 17:21 (d) 20:21 (e) 21:20

Previous Years' Solutions of Prelims

1. **(b):** Required sum = $(64 - 30) + (72 - 32) + (76 - 48)$
 $= 34 + 40 + 28 = 102$
2. **(a):** Total people visited in park F = $(76+68)+18=162$
 So, number of boys visited in park F = $162 \times \frac{5}{9} = 90$
3. **(c):** Required percentage = $\frac{30}{64} \times 100 = 46.875 \approx 47\%$
4. **(b):** Required revenue = $24 \times 54 = 1296$ Rs.
5. **(d):** Required percentage = $\frac{72-54}{54} \times 100$
 $= \frac{18}{54} \times 100 = 33\frac{1}{3}\% \approx 33\%$
6. **(a):** Required percentage = $\frac{40-32}{40} \times 100 = 20\%$
7. **(c):** Required sum = $(28 + 12) + (38 + 15) = 93$
8. **(a):** Required average = $\frac{50+32+38}{3} = 40$
9. **(b):** Let total videos shared by E = x
 So, total photos shared by E = $(x + 4)$
 ATQ -
 $x + x + 4 = 44$
 $2x = 40$
 $x = 20$
10. **(a):** Total photos shared by B = $28 \times \frac{5}{14} = 10$
11. **(b):** Required percentage = $\frac{36-33}{36} \times 100$
 $= \frac{3}{36} \times 100 = 8\frac{1}{3}\%$
12. **(a):** Required average = $\frac{36+27+33}{3} = 32$
13. **(e):** Required ratio = $18 : 22 = 9 : 11$
14. **(b):** Total passenger in C and E = $27 + 33 = 60$
 Required percentage = $\frac{60-36}{36} \times 100$
 $= \frac{24}{36} \times 100 = 66\frac{2}{3}\%$
15. **(c):** Required number of passengers = $18+27+22=67$
16. **(a):** Required difference = $\frac{20+20+20}{3} = 20$
17. **(c):** Required % = $\frac{60-(20+20)}{60} \times 100 = 33\frac{1}{3}\%$
18. **(b):** Total marks = $72 \times 2 - 18 \times 1$
 $= 144 - 18 = 126$
19. **(a):** Required ratio = $10:20 = 1:2$
20. **(d):** Required sum = $\frac{70}{100} \times 90 + \frac{85}{100} \times 80$
 $= 63 + 68 = 131$
21. **(d):** total population of city A = $300 + 400 = 700$
 Total population of city D = $450 + 550 = 1000$
 Required % = $\frac{1000-700}{1000} \times 100 = 30\%$ less
22. **(a):** total graduate population = $\frac{70}{100} \times (300+400) = 490$
 Female graduate population = $\frac{4}{7} \times 490 = 280$
 Female population who is not graduate
 $= 400 - 280 = 120$
23. **(e):** required average = $\frac{300+550+500+450+350}{5} = \frac{2150}{5} = 430$
24. **(b):** required % = $\frac{350}{400} \times 100 = 87.5\%$
25. **(d):** Postgraduate population in city B = $300 + 400 = 700$
 Postgraduate population in city C = $\frac{8}{7} \times 700 = 800$
 Required ratio = $(1000 - 700) : (900 - 800) = 300 : 100 = 3 : 1$
26. **(b):** required average = $\frac{(450+600+300+200+400) \times 1000}{5}$
 $= 390000$
27. **(c):** required ratio = $\frac{(600+200) \times 1000}{(300+400) \times 1000} = \frac{800}{700} = \frac{8}{7}$
28. **(d):** required no. of employees = $\frac{75}{100} \times 450000 = 337500$
29. **(a):** required percentage = $\frac{600000}{400000} \times 100 = 150\%$
30. **(e):** required percentage = $\frac{(450-200) \times 1000}{200 \times 1000} \times 100$
 $= 125\%$
31. **(a):** Viewed questions of B in Finance and Accounts together = $48 + 56 = 104$
 Unseen questions of A in Finance and Economics together = $(150 - 64) + (150 - 36)$
 $= 86 + 114 = 200$
 Required % = $\frac{104}{200} \times 100 = 52\%$
32. **(c):** Unseen questions of B in Economics and Accounts together = $(150 - 76) + (150 - 56)$
 $= 74 + 94 = 168$
 Average viewed questions of A in Finance and Accounts = $\frac{64+96}{2} = 80$
 Required difference = $168 - 80 = 88$
33. **(d):** Unseen questions of B in Finance, Economics and Accounts
 $= (150 - 48) + (150 - 76) + (150 - 56)$
 $= 102 + 74 + 94$
 $= 270$
 Required average = $\frac{270}{3} = 90$

34. (c): Unseen questions of A in Accounts = $150 - 96 = 54$
 Viewed questions of A & B together in Economics = $36 + 76 = 112$
 Required % = $\frac{112-54}{112} \times 100$
 = $51.79\% = 52\%$ (approx.)

35. (c): Unseen questions of A in Finance, Economics and Accounts together
 = $(150 - 64) + (150 - 36) + (150 - 96)$
 = $86 + 114 + 54$
 = 254
 Unseen questions of B in Finance, Economics and Accounts together
 = $(150 - 48) + (150 - 76) + (150 - 56)$
 = $102 + 74 + 94$
 = 270
 Required difference = $270 - 254 = 16$

36. (d): Required % = $\frac{120+240}{160+240} \times 100 = \frac{360}{400} \times 100 = 90\%$

37. (a):
 Average number of Women working in 2014, 2015 and 2016 together
 = $\frac{1}{3}[240 + 360 + 300] = \frac{900}{3} = 300$
 Average number of Men working in 2011, 2014 and 2016 together
 = $\frac{1}{3}[80 + 160 + 360] = \frac{600}{3} = 200$
 Required difference = $300 - 200 = 100$

38. (c):
 Number of Men working in 2017 = $\frac{115}{100} \times 300 = 345$
 Number of Women working in 2017 = $\frac{60}{100} \times 240 = 144$
 Total number of labors working in 2017 = $345 + 144 = 489$

39. (b):
 Required Ratio = $\frac{(120+180)+(240+120)}{(300+360)+(360+300)} = \frac{300+360}{660+660} = \frac{660}{1320} = \frac{1}{2}$

40. (e):
 Total number of Men working in all six years
 = $80 + 120 + 240 + 160 + 300 + 360 = 1260$
 Total number of Women working in all six years
 = $260 + 180 + 120 + 240 + 360 + 300 = 1460$
 Required difference = $1460 - 1260 = 200$

41. (a): Total sales of company B in 2012 and that of company A in 2014 = $2500 + 4000 = 6500$
 Total sales of company A in 2011 and that of company B in 2015 = $2000 + 4000 = 6000$
 Ratio = $\frac{6500}{6000} = \frac{13}{12}$

42. (b): Sales of company A in 2016 = $5000 \times \frac{120}{100} = 6000$
 Sales of company B in 2016 = $4000 \times \frac{110}{100} = 4400$
 Difference = $6000 - 4400 = 1600$

43. (c): Total sales in 2011 = $2000 + 1000 = 3000$
 Total sales in 2015 = $5000 + 4000 = 9000$
 Req.% = $\frac{9000-3000}{3000} = 200\%$

44. (b): Sales of company A from 2012 to 2014 = $3500 + 4500 + 4000$
 = 12000
 Sales of company B from 2013 to 2015 = $3000 + 4500 + 4000$
 = 11500
 Difference = 500

45. (a): Sales of company A in 2010 = $2000 \times \frac{3}{4} = 1500$
 Percentage % = $\frac{5000-1500}{1500} \times 100$
 = $\frac{3500}{1500} \times 100 = 233.33\%$

46. (c): Difference = $-20 + 10 + 20 + 20 + 20 + 20 = 70$
 Avg. = $\frac{70}{6} \approx 11.67$

47. (a) Total students in 2012 & 2015 = $650 + 820 = 1470$
 Total students from A in all given years = 2310
 Desired % = $\frac{1470}{2310} \times 100 = 63.6\%$

48. (c): No. of children for Class B in all years = 2240
 No of children for class A in all years = 2310
 Desired ratio = $\frac{2240}{2310} = 32 : 33$

49. (a): Total desired sum = $(320 + 400) + (400 + 440)$
 = 1560

50. (d):
 Class B = 2240
 Class A = 2310
 Total = 4550
 Desired value = $\frac{4550-2240}{4550} \times 100 \approx 50.8\%$

51. (b): Required difference
 = $\frac{268000}{6} - \frac{229000}{6} = \frac{39000}{6} = 6500$

52. (a): Total graduates in 2013 & 2016
 = $(38000 + 40000) + (31000 + 60000)$
 = 169000
 Total Engineering graduates = 229000
 Desired % = $\frac{169000}{229000} \times 100 \approx 74$

53. (b): Total Engineering graduates = 22900
 Total Medical graduates = 26800
 Ratio = $268 : 229$

54. (c): Sum = $(45000 + 38000) + (60000 + 50000)$
 = 193000

55. (a): It is evident from the graph itself that medical graduates are approximately 100% more than Engineering graduates in 2016.

Sol. (56-60):

Subject	Maths	English	Science
A	44	50	36
B	40	54	30

56. (b): Avg marks obtained by A&B in Maths = $\frac{44+40}{2} = 42$

Avg marks obtained by A&B in Science

$$= \frac{36+30}{2} = 33$$

Required Difference = 9

57. (d): Marks obtained in History by B = $\frac{112}{100} \times 50 = 56$

Marks obtained in Geography by B = $\frac{125}{100} \times 40$

= 50

Total marks = 50+56 = 106

58. (a): Total marks obtained by A = 130

$$\text{Required percentage} = \frac{130}{300} \times 100$$

$$= 43.33\%$$

59. (b): Total Marks obtained by B in Maths and Science = 70

Marks scored by A in English = 50

$$\text{Required percentage} = \frac{20}{50} \times 100 = 40\%$$

60. (d): Required ratio = (44 + 36) : (54 + 30)

$$= 80 : 84$$

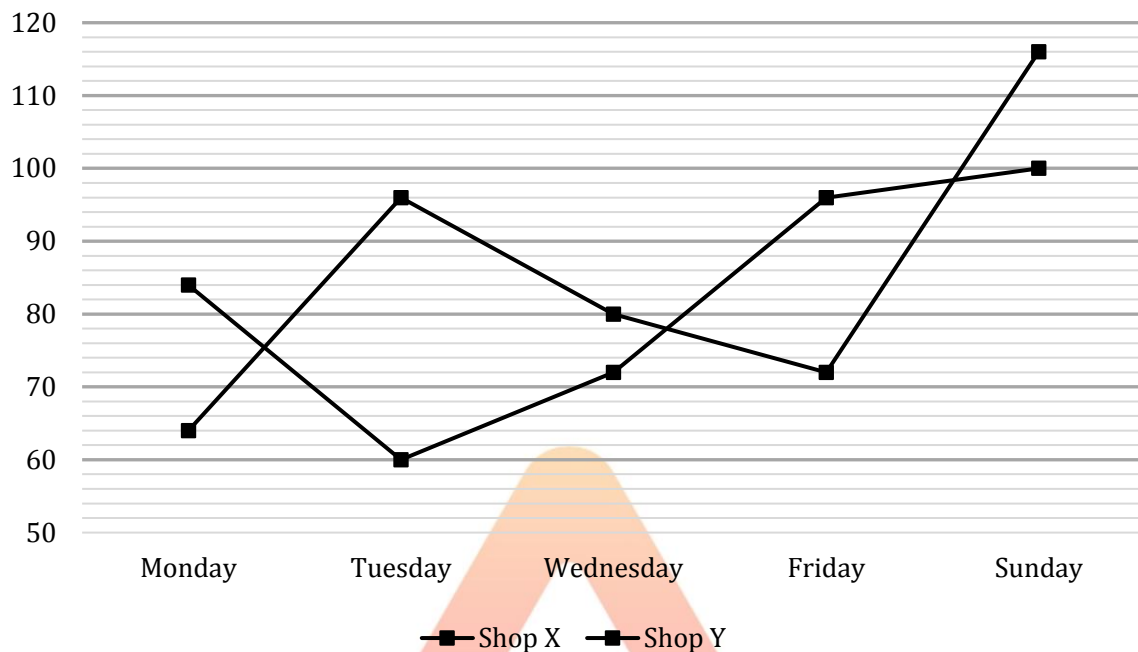
$$= 20 : 21$$

@cetexamgroup

The advertisement features a blue background with a woman's face. On the left, the Adda247 logo is shown above the text "Govt. jobs' coaching, now in your Pocket!". Below this, it says "Download the Adda247 App and boost your preparation." with a "GET IT ON Google Play" button. On the right, a smartphone displays the app's interface, which includes a "BANKING" header, a banner for "IBPS RRB with BRAND-NEW LIVE BATCH", and a section titled "Find Products by Exam" with icons for IBPS PO, IBPS RRB, SBI PO, SBI Clerk, EPFO, and IIBF JAIB. A "Browse by Product" section is visible at the bottom of the phone screen.

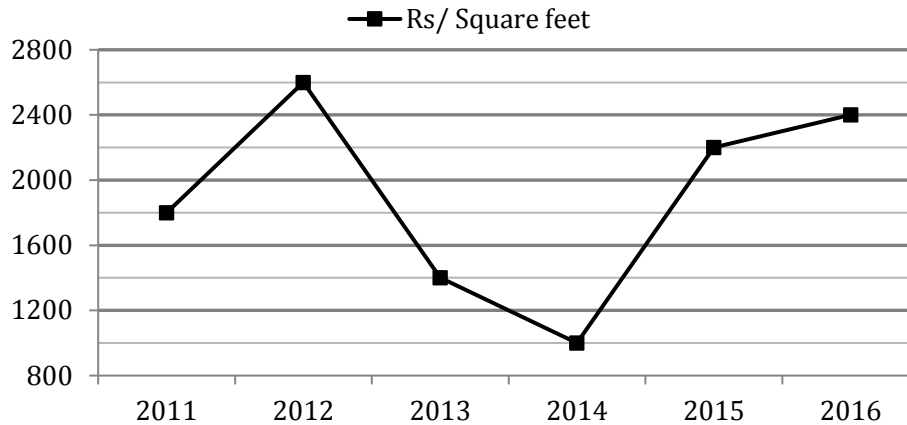
Previous Years' Questions of Mains

Direction (1-6): The line graph given below shows the number of stationaries sold by two shops X and Y on five different days of a week. Stationary includes pens, books and copies only.



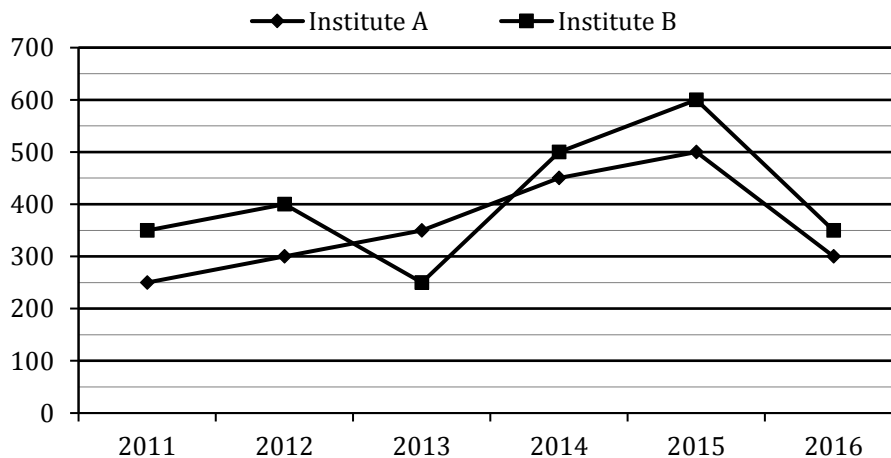
- Total number of stationaries sold by shop X on Monday and Wednesday together is how much more/less than the total number of stationaries sold by shop Y on Tuesday and Friday together?
(a) 10 (b) 12 (c) 14 (d) 16 (e) 18
- What is the ratio of the total number of stationaries sold by both shop on Tuesday to that on Wednesday?
(a) 39 : 38 (b) 38 : 39 (c) 41 : 38 (d) 37 : 35 (e) None of these
- The average of the number of stationaries sold by shop X on Tuesday, Friday and Sunday is approximately what percent more or less than the average number of stationaries sold by shop Y on Monday, Tuesday and Wednesday.
(a) 5% (b) $6\frac{1}{2}\%$ (c) 10% (d) $6\frac{2}{3}\%$ (e) $5\frac{1}{2}\%$
- Total number of stationaries sold on Sunday by both shop is what percent of the total number of stationaries sold on Monday and Wednesday together by both shop.
(a) 65% (b) 60% (c) 80% (d) 75% (e) 72%
- Out of the total number of stationaries sold by shop Y on Monday, Tuesday and Wednesday together, $16\frac{1}{4}\%$ are the copies and the ratio between number of books sold to that of pen sold is 1:2. Find the difference between the number of pens sold and number of copies sold.
(a) 95 (b) 96 (c) 93 (d) 92 (e) 98
- The ratio of the number of pens, copies and books sold by both the shop on Sunday is 3:3:2. The number of pens and books sold on Sunday is what percent more or less than the number of stationaries sold on Tuesday by both the shops.
(a) $13\frac{1}{3}\%$ (b) $13\frac{7}{13}\%$ (c) $13\frac{6}{13}\%$ (d) $13\frac{3}{13}\%$ (e) $13\frac{2}{3}\%$

Direction (7-11): Line-graph given below shows the price per square feet of land in different years. Study the given line graph carefully & answer the questions.



7. In 2015, if Rahul bought a plot of 1800 sq. feet. Then how much plot he has bought with the same amount in 2016?
 (a) 1650 sq. feet (b) 1720 sq. feet (c) 1825 sq. feet (d) None of these (e) 1850 sq. feet
8. In 2016 if veer bought a plot 800 sq. feet & want to sell it in 2017 to earn profit of 20%. Then find the price per sq. feet in 2017 for same plot?
 (a) Rs. 2250 (b) None of these (c) Rs. 2730 (d) Rs. 2880 (e) Rs. 2460
9. If Satish bought 1840 sq. feet land in 2012 and Sandy bought 1640 sq. feet land in 2014. Then find ratio of amount spent by Satish in 2012 to amount spent by sandy in 2014?
 (a) 3 : 5 (b) 205 : 598 (c) 598 : 205 (d) 538 : 207 (e) 598 : 305
10. If Ayush bought a plot in 2010 at a price $\frac{3}{4}$ th of the price in 2013. Then, find difference of amount paid by Ayush to buy plot of 2240 sq. feet in 2010 and 2013.
 (a) Rs. 8.28 lakh (b) Rs. 4.84 lakh (c) Rs. 5.64 lakh (d) Rs. 6.28 lakh (e) Rs. 7.84 lakh
11. If plot bought by Abhi in 2016 is 2420 sq. feet and plot bought by Roly in 2011 is 1640 sq. feet. Then find average of money spent by Abhi and Roly?
 (a) Rs. 58.6 lakh (b) Rs. 53.4 lakh (c) None of these (d) Rs. 43.8 lakh (e) Rs. 48.2 lakh

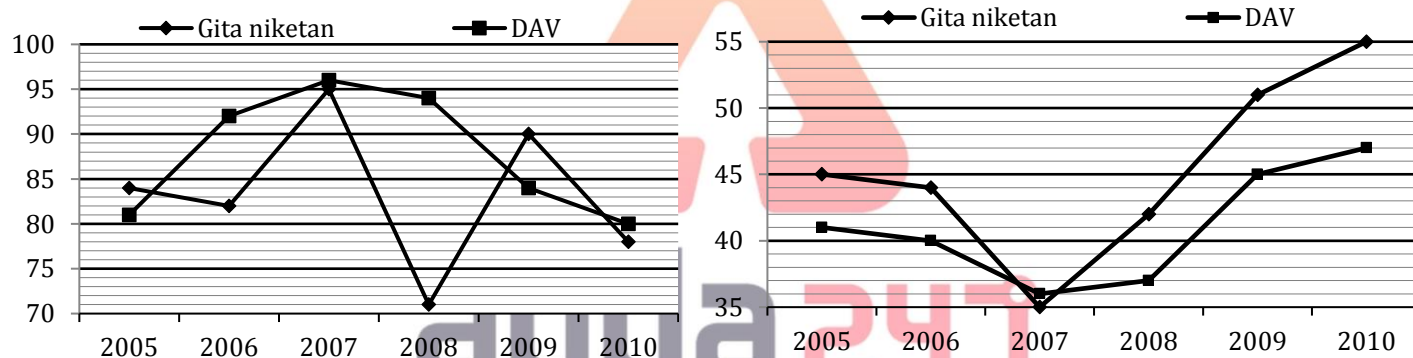
Directions (12-16): Given below is the graph showing the number of students taking admission to two different institutes in the given years.



12. What is the ratio of 150% of number of student taking admission in year 2013 from both institutes to the 125% of number of students taking admission in year 2015 from both institutes?
 (a) 36 : 55 (b) 55 : 57 (c) 53 : 57 (d) 46 : 53 (e) 51 : 57

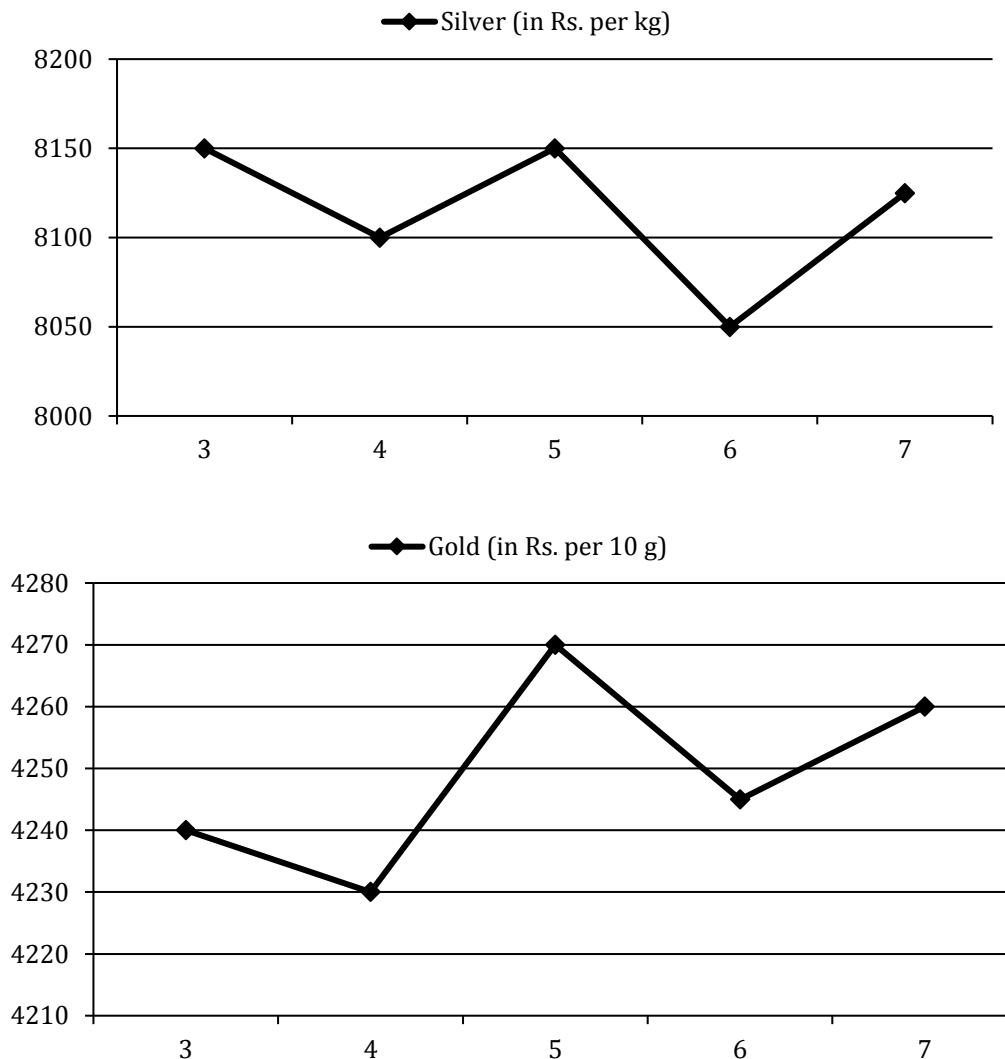
13. In which year, total number of students taking admission in both institutes together is second highest?
 (a) 2015 (b) 2013 (c) 2014 (d) 2012 (e) 2016
14. Number of students taking admission in institute A in years 2010 and 2012 together are what percent of number of students taking admission in institute B in years 2013 and 2014 together, if the number of students taking admission in institute A in 2010 is 20% more than the number of students taking admission in institute A in 2011?
 (a) 60% (b) 65% (c) 85% (d) 90% (e) 80%
15. Number of students taking admission in institute A in year 2011, 2013 and 2014 together are what percent more or less than the number of students taking admission in institute B in year 2012, 2013 and 2015 together?
 (a) 20% (b) 16% (c) 19% (d) 13% (e) 15%
16. What is the ratio of total number of students taking admission in institute B to the total number of students taking admission in institute A overall years?
 (a) 23 : 27 (b) 53 : 54 (c) 20 : 23 (d) 49 : 43 (e) 53 : 57

Directions (17-21): Given below is the line graphs, first showing number of students participated (in hundreds) in NTSE (National Talent Search Exam) from 2 different schools from 2005-2010, the second line graph shows the corresponding percentage of girls participated in this exam. Read the graphs carefully and answer the following questions:



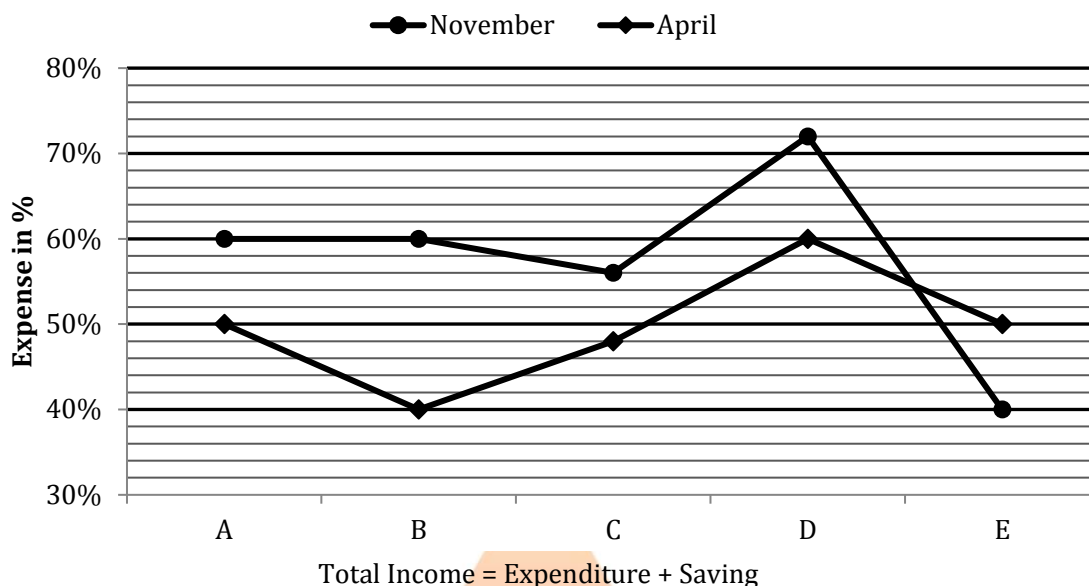
17. If no. of boys participated from Greenfield public school in 2009 is 10% less than the total no. of girls participated from DAV and Geeta Niketan in that year and the boys participated in 2009 from Greenfield was 45% of the total students participated from greenfield in that year, then find the no. of girls participated from greenfield school in 2009?
 (a) 9428 (b) 8294 (c) 9211 (d) 9207 (e) 9084
18. The difference between total number of boys participated and total number of girls participated from Gita Niketan in all years together is what percent of the total students participated from Gita Niketan in all years?
 (a) 9.7% (b) 9.1% (c) 10.6% (d) 8.4% (e) 8.7%
19. Girls participated from DAV in 2007 is approximately what percent less/more than the boys participated from Gita Niketan in 2009 and 2010 together?
 (a) 56% (b) 42% (c) 50% (d) 44% (e) 66%
20. Find the difference between average no. of students participated from the 2 Schools over the years.
 (a) 4.5 (b) 45 (c) 415 (d) 465 (e) 450
21. Find the total number of boys participated from Gita Niketan in all years together
 (a) 23225 (b) 27425 (c) 28525 (d) 29625 (e) None of these

Directions (22-26): The following graphs show the price of gold (in Rs. per 10 g) and silver (in Rs. per kg) on 3rd, 4th 5th, 6th and 7th of August 2010 in Mumbai. Study the graphs and answer the questions that follow.



- 22.** On 8th August, the price of silver (in Rs. per kg) is increased by 12% as compared to previous day and the price of gold (in Rs. 10 g) is decreased by 15% as compared to previous day then find the ratio of the average price of silver (in Rs. per kg) from 4th to 8th August to the average price of gold (in Rs. per 10 g) from 5th to 8th August.
 (a) 1491 : 3020 (b) 8305 : 4099 (c) 4017 : 1213 (d) 1213 : 4017 (e) None of these
- 23.** On 2nd August the ratio between the price of silver (in Rs. per kg) and gold (in Rs. per 10 g) is 51 : 25 and the price of gold on 3rd August was 6% more than that of 2nd August then Find the average price of silver (in Rs. per kg) from 2nd August to 6th August ?
 (a) 8212 Rs. (b) 8132 Rs. (c) 8130 Rs. (d) 8120 Rs. (e) 8122 Rs.
- 24.** By how much per cent the rate of silver is less than the rate of gold on 6th August, 2010 ?
 (a) 92% (b) 98% (c) 108% (d) Can't be determined (e) 88%
- 25.** What is difference of average price of gold (in Rs/10gm) and average price of silver (in Rs/kg) ?
 (a) 3866 (b) 4866 (c) 3226 (d) 3846 (e) 3626
- 26.** What is the average price of silver (in Rs. /kg) for the given dates?
 (a) 8217 (b) 8007 (c) 8120 (d) 8140 (e) 8115

Directions (27-29): Line chart given below shows expense of five persons (in %) out of total income of two months. Income of persons is same in both months.



27. Find the difference between income of D and E ?

(I) Difference between expense of 'D' in November and saving of 'E' in April is Rs 3200.

(II) Difference between Saving of 'D' in April and Expense of 'E' in November is Rs 8000.

- (a) Statement (I) alone is sufficient to answer the question but statement (II) alone is not sufficient to answer the questions.
- (b) Statement (II) alone is sufficient to answer the question but statement (I) alone is not sufficient to answer the question.
- (c) Both the statements taken together are necessary to answer the questions, but neither of the statements alone is sufficient to answer the question.
- (d) Either statement (I) or statement (II) by itself is sufficient to answer the question.
- (e) Statements (I) and (II) taken together are not sufficient to answer the question.

28. Average saving of 'C' in both months is Rs 19,200 while A's income is 20% more than C's income. Find expense of 'A' in the month of November

- (a) Rs 9600 (b) Rs 19200 (c) Rs 38400 (d) Rs 24000 (e) Rs 28800

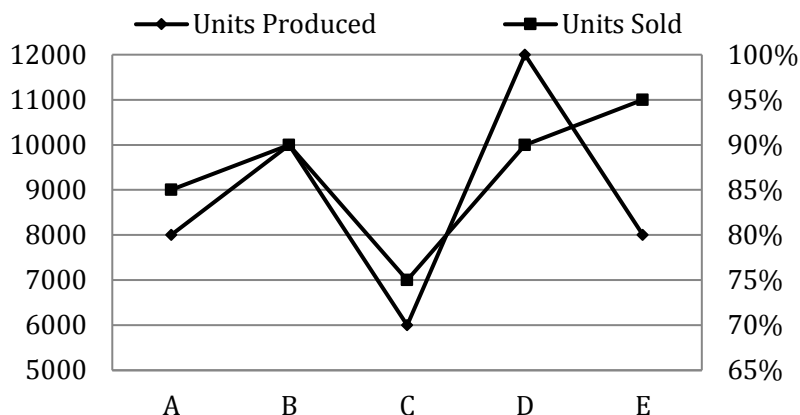
29. 'B' invested some amount of his saving in PPF account in November. Find the amount invested by 'B' in PPF account?

(I) Amount invested by 'B' in PPF is 62.5% less than amount expend by 'B' in April while difference between amount expend by 'B' in November and April is Rs. 16,000.

(II) 'B' invested 37.5% of his saving in PPF account while difference between saving of 'B' in November and April is Rs 16,000.

- (a) Statement (I) alone is sufficient to answer the question but statement (II) alone is not sufficient to answer the questions.
- (b) Statement (II) alone is sufficient to answer the question but statement (I) alone is not sufficient to answer the question.
- (c) Both the statements taken together are necessary to answer the questions, but neither of the statements alone is sufficient to answer the question.
- (d) Either statement (I) or statement (II) by itself is sufficient to answer the question.
- (e) Statements (I) and (II) taken together are not sufficient to answer the question.

Directions (30-32): Study the below mentioned line chart carefully and answer the following questions.
Line chart shows the units produced (in units) and units sold (in %) by 5 different companies in a given year.

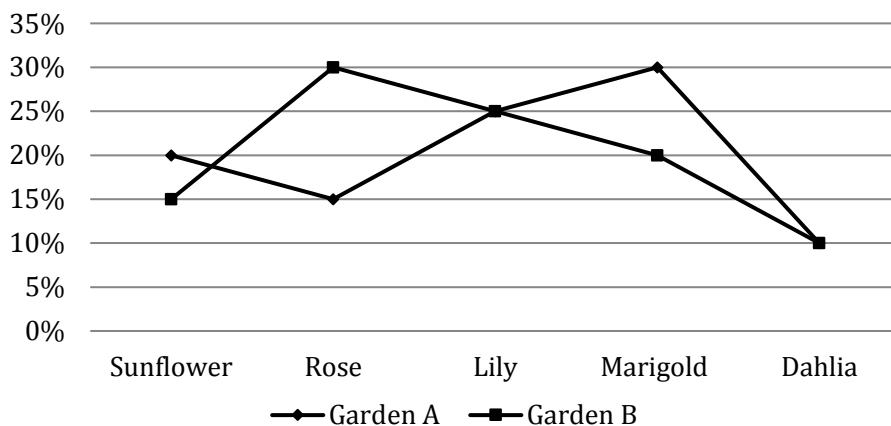


Note - % Units sold by a company = $\frac{\text{Units sold by a company}}{\text{Units produced by a company}} \times 100$

Note - Total units produced = Total units sold + Total units unsold.

- 30.** Selling price of an unit sold by company-E & company-B is Rs.15 and Rs.13 respectively. 12% and 15% of units sold by company-E & company-B respectively are returned by the customers. Then, find the difference between total revenue of company-B & company-E.
(a) Rs.970 (b) Rs.870 (c) Rs.910 (d) Rs.840 (e) Rs.810
- 31.** Revenue of company-D is Rs.48,600 more than revenue of company-C and selling price of each unit of company-C is Rs.6 more than the selling price of each unit of company-D. If profit % earned by company-C is 20%, then find the cost price of each unit sold by company-C.
(a) Rs.20 (b) Rs.15 (c) Rs.10 (d) Rs.25 (e) Rs.30
- 32.** If units sold by company-F is 350% of the unsold units of company-D & E together and ratio of sold units to unsold units of company-F is 7 : 3. Then, find total units produced by company-F.
(a) 10000 (b) 9000 (c) 8000 (d) 12000 (e) 11000

Direction (33 -36): Line graph shows percentage distribution of five flowers in garden A and also shows percentage distribution of these same five flowers in garden 'B'. Read the data carefully and answer the question.

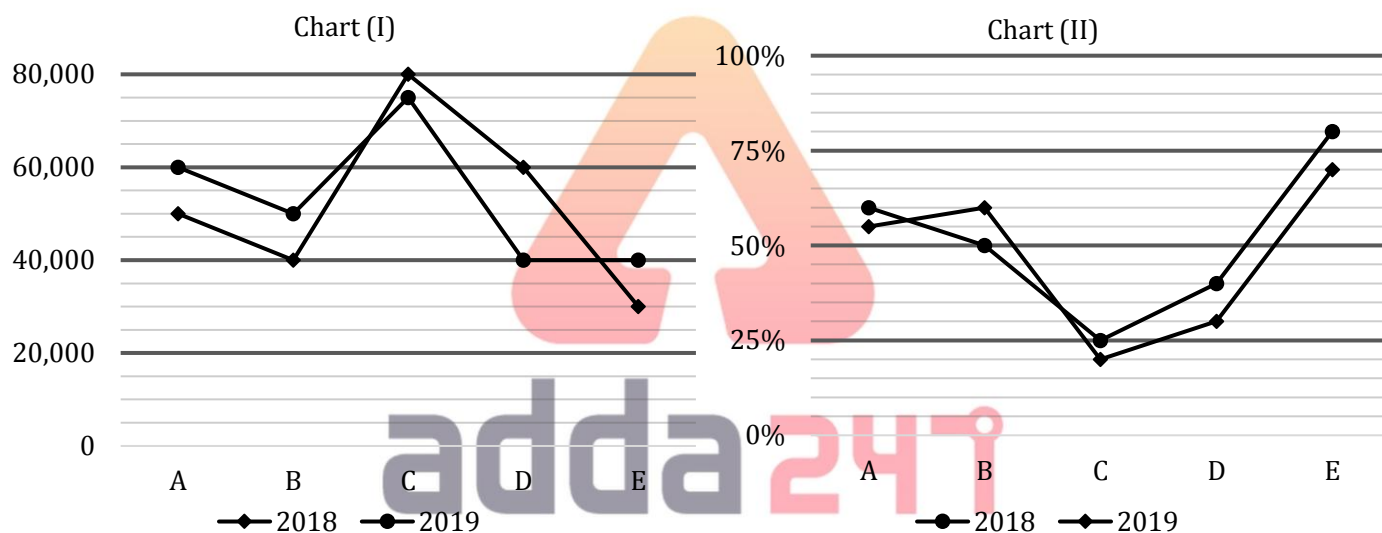


- 33.** If total Rose in garden 'A' is 40% of total Rose in garden 'B', then find total flowers in garden 'B' is how much percent more than total flower in garden 'A'?
(a) 20% (b) 15% (c) 10% (d) 25% (e) 30%

34. If total number of flowers in garden 'B' is 40% more than that of in garden 'A' and total number of Dahlias in garden 'A' & 'B' together is 384, then find the total number of Marigold in both garden 'A' & 'B' together?
 (a) 928 (b) 918 (c) 920 (d) 936 (e) 948
35. If ratio between total number of flowers in garden 'A' to that of in garden 'B' is 3 : 4, then what is the percentage of total sunflower in garden 'A' & garden 'B' together?
 (a) $15\frac{1}{7}\%$ (b) $13\frac{1}{7}\%$ (c) $11\frac{1}{7}\%$ (d) $9\frac{1}{7}\%$ (e) $17\frac{1}{7}\%$
36. Total flower in garden 'B' is 80% more than total flower in garden 'A' and total lily in both gardens is 840, then find difference between total marigold in garden 'A' and total dahlia in garden 'B'?
 (a) 142 (b) 140 (c) 144 (d) 148 (e) 152

Direction (37-40): Line chart (I) shows total population in five different cities (A, B, C, D & E) in 2018 & 2019 and line chart (II) shows the percentage of literate population out of total population in these five cities in given two years. Study the data given below carefully and answer the following questions.

Note – Total population in any city in any year = Total (literate + illiterate) population in that city in that year.



37. Total illiterate population in cities D & E together in 2018 are what percent more or less than total illiterate population in cities B & C together in 2019?
 (a) 47.5% (b) 32.5% (c) 56.5% (d) 24.5% (e) 42.5%
38. Average number of illiterate populations in cities B, D & E in 2019 are what percent of literate population in cities A & C together in 2018?
 (a) 75% (b) 60% (c) 40% (d) 20% (e) 25%
39. Find the ratio of average number of literate populations in cities A, B & C in 2019 to total literate population in cities A, D & E together in 2018.
 (a) 9:11 (b) 7:4 (c) 5:2 (d) 1:3 (e) None of the above.
40. Total illiterate population in these five cities together in 2019 are how much less than total population in these five cities together in 2018?
 (a) 1,13,000 (b) 1,32,000 (c) 1,02,000 (d) 1,20,000 (e) 1,29,000

Previous Years' Solutions of Mains

1. **(b):** Required difference = $(96 + 72) - (84 + 72)$
 $= 168 - 156 = 12$
2. **(a):** Required ratio = $\frac{(96+60)}{(80+72)} = 39 : 38$
3. **(d):** Required percentage = $\frac{\left[\frac{1}{3}(60+96+100) - \frac{1}{3}(64+96+80)\right]}{\frac{1}{3}(64+96+80)}$
 $= \frac{16 \times 100}{3 \times 80} = \frac{20}{3}\% = 6\frac{2}{3}\%$
4. **(e):** Required percentage = $\frac{116+100}{(84+64)+(80+72)} \times 100 = \frac{216}{300} \times 100 = 72\%$
5. **(a):** Total number of stationaries sold by shop Y on Monday, Tuesday and Wednesday together = $64+96+80=240$
 number of copies = $240 \times \frac{65}{4 \times 100} = 39$
 number of pens = $201 \times \frac{2}{3} = 134$
 required difference = $134 - 39 = 95$
6. **(c):** Total number of Pens and books sold on Sunday = $216 \times \frac{5}{8} = 135$
 Required % = $\frac{156-135}{156} \times 100 = \frac{21}{156} \times 100 = \frac{175}{13}\% = 13\frac{6}{13}\%$
7. **(a):** Required plot = $\frac{1800 \times 2200}{2400} = 1650$ sq. feet
8. **(d):** Required price per sq. feet in 2017 = $2400 \times \frac{120}{100} = \text{Rs. } 2880$
9. **(c):** Required ratio = $\frac{1840 \times 2600}{1640 \times 1000} = 598 : 205$
10. **(e):** Required difference = $2240 \times 1400 - 2240 \times 1400 \times \frac{3}{4} = 2240 \times 1400 \left[\frac{1}{4}\right] = \text{Rs. } 784000$
11. **(d):** Required average = $\frac{2420 \times 2400 + 1640 \times 1800}{2} = 4380000$
 $= \text{Rs. } 43.8 \text{ lakh}$
12. **(a):** Required ratio = 150% of $(350 + 250) : 125\%$ of $(500 + 600) = 36 : 55$
13. **(c):** While observing the graph carefully, we find that the number of students are more in year 2014 and 2015 than any other year. So, the number of students taking admission in both institute is second highest in 2014.
14. **(e):** Number of students taking admission in institute A in 2010 = $\frac{6}{5} \times 250 = 300$
 Required % = $\frac{300+300}{250+500} \times 100 = \frac{600}{750} \times 100 = 80\%$
15. **(b):** Required percentage = $\frac{(400+250+600)-(250+350+450)}{400+250+600} \times 100 = \frac{200}{1250} \times 100 = 16\%$
16. **(d):** Required Ratio = $2450 : 2150 = 49 : 43$
17. **(d):** Girls participated in 2009 = $\frac{45}{100} \times 8400 + \frac{51}{100} \times 9000 = 3780 + 4590 = 8370$
 boys participated from green field public school = $\frac{90}{100} \times 8370 = 7533$
 total no. of students of green field = $7533 \times \frac{100}{45} = 16740$
 no. of girls = $16740 - 7533 = 9207$
18. **(a):** Total no. of girls participated = 22575
 Total no. of boys participated = 27425
 required percentage = $\frac{27425-22575}{50000} \times 100 = 9.7\%$
19. **(a):** Girls participated from DAV in 2007 = $9600 \times \frac{36}{100} = 3456$
 boys participated from Gita Niketan in 2009 and 2010 together = $9000 \times \frac{49}{100} + 7800 \times \frac{45}{100} = 7920$
 percentage = $\frac{7920-3456}{7920} \times 100 \approx 56\%$
20. **(e):** required difference = $\frac{527}{6} - \frac{500}{6} = \frac{2700}{6}$ hundred
 $= \frac{2700}{6} = 450$
21. **(b):** Total no. of boys = $84 \times \frac{55}{100} + 82 \times \frac{56}{100} + \frac{65}{100} \times 95 + \frac{58}{100} \times 71 + \frac{49}{100} \times 90 + \frac{45}{100} \times 78 = 27425$ boy
22. **(b):** Average price of silver from 4th to 8th August = $\frac{8100+8150+8050+8125+1.12 \times 8125}{5} = \frac{41525}{5}$
 Average price of Gold from 5th to 8th August = $\frac{4270+4245+4260+0.85 \times 4260}{4} = \frac{16396}{4}$
 \therefore Required Ratio = $\frac{41525 \times 4}{16396 \times 5} = 8305 : 4099$

- 23. (e):** Price of gold on 2nd August = $\frac{100}{106} \times 4240 = 4000$ Rs.
 Price of silver on 2nd August = $\frac{4000}{25} \times 51 = 8160$
 Required average price = $\frac{8160+8150+8100+8150+8050}{5} = 8122$ Rs.
- 24. (b):** Rate of 1 kg silver on 6th August = Rs. 8050
 Rate of 1 kg gold on 6th August = Rs. 424500
 Therefore, required percentage = $\frac{424500-8050}{424500} \times 100 = \frac{416450}{424500} \times 100 \approx 98\%$
- 25. (a):** Average price of gold per 10gm for given five days = $\frac{(4240+4230+4270+4245+4260)}{5} = \frac{21245}{5} = \text{Rs. } 4249$
 Average price of silver per kg for given five days = $\frac{8150+8100+8150+8050+8125}{5} = 8115$
 \therefore Required difference = $8115 - 4249 = 3866$
- 26. (e):** Average price of silver = $\frac{8150+8100+8150+8050+8125}{5} = \frac{40575}{5} = \text{Rs. } 8115$ per kg
- 27. (b):** Let income of 'D' and 'E' is x and y respectively.
 We have to find the value of 'x - y'.
 From (I)
 $0.72x - 0.5y = 3200$
 From (II)
 $0.4x - 0.4y = 8000$
 $x - y = \frac{8000}{0.4} = 20000$
 Hence, only (II) is sufficient to answer the question.
- 28. (e):** Let Rs C's income is Rs x
 ATQ,
 $\frac{0.44x+0.52x}{2} = 19200$
 $\Rightarrow x = \frac{2 \times 19200}{0.96} = 40,000$
 A's income = $1.2 \times 40,000 = 48,000$
 A's expense in the month of November = $\frac{60}{100} \times 48000 = \text{Rs } 28800$
- 29. (d):** Let, income of B is Rs x
 From (I)
 $0.6x - 0.4x = 16000$
 $\Rightarrow x = \frac{16000}{0.2} = 80,000$
 Amount invested by 'B' is PPF = $80,000 \times \frac{40}{100} \times \frac{37.5}{100} = \text{Rs } 12,000$
 From (II)
 $0.6x - 0.4x = 16000$
 $\Rightarrow x = \frac{16000}{0.2} = 80,000$

Amount invested by 'B' in PPF = $\frac{37.5}{100} \times \frac{40}{100} \times 80,000 = \text{Rs } 12000$
 Hence, either statement (I) or statement (II) by itself is sufficient to answer the question.

- 30. (b):** Units sold by company-B = $10000 \times \frac{90}{100} = 9000$
 Units sold by company-E = $8000 \times \frac{95}{100} = 7600$
 Units returned by customer to company-B = $9000 \times \frac{15}{100} = 1350$
 Units returned by customers to company-E = $7600 \times \frac{12}{100} = 912$
 Total revenue of company-B = $13 \times (9000 - 1350) = 13 \times 7650 = \text{Rs. } 99450$
 Total Revenue of company-E = $15 \times (7600 - 912) = 15 \times 6688 = \text{Rs. } 100320$
 Required difference = $100320 - 99450 = \text{Rs. } 870$
- 31. (b):** Let selling price of each unit sold by company-C be Rs. x
 So, selling price of each unit sold by company-D = Rs. (x - 6)
 ATQ,
 $12000 \times \frac{90}{100} \times (x - 6) - 6000 \times \frac{75}{100} \times x = 48600$
 $10800x - 64800 - 4500x = 48600$
 $6300x = 113400$
 $x = \text{Rs. } 18$
 Required price = $18 \times \frac{100}{120} = \text{Rs. } 15$
- 32. (c):** Unsold units of company - D & E together = $12000 \times \frac{10}{100} + 8000 \times \frac{5}{100} = 1200 + 400 = 1600$
 Units sold of company - F = $1600 \times \frac{350}{100} = 5600$
 Total units produced by company - F = $5600 \times \frac{10}{7} = 8000$
- 33. (d):** Let total flowers in garden 'A' & 'B' is a & b respectively
 Total Rose in garden 'A' = $0.15a$
 Total Rose in garden 'B' = $0.30b$
 ATQ -
 $0.30b \times \frac{40}{100} = 0.15a$
 $0.12b = 0.15a$
 $b = 1.25a$
 Required percentage = $\frac{1.25a-a}{a} \times 100 = 25\%$
- 34. (a):** Let total number of flowers in garden 'A' is 100x and in garden 'B' is 140x
 ATQ -
 $100x \times \frac{10}{100} + 140x \times \frac{10}{100} = 384$
 $10x + 14x = 384$
 $x = 16$

Total number of Marigolds in both garden 'A' & 'B' together

$$= 16 \times 100 \times \frac{30}{100} + 16 \times 140 \times \frac{20}{100}$$

$$= 480 + 448$$

$$= 928$$

35. (e): Let total number of flowers in garden 'A' & garden 'B' be $3x$ & $4x$ respectively

Total number of Sunflower in garden 'A' & garden 'B' together

$$= 3x \times .20 + 4x \times 0.15 = 1.2x$$

$$\text{Required percentage} = \frac{1.2x}{7x} \times 100 = 17\frac{1}{7}\%$$

36. (c): Let total number of flowers in garden 'A' is $100x$ and in garden 'B' is $180x$

ATQ -

$$100x \times \frac{25}{100} + 180x \times \frac{25}{100} = 840$$

$$25x + 45x = 840$$

$$x = 12$$

$$\text{Total Marigold in garden 'A'} = 1200 \times \frac{30}{100} = 360$$

$$\text{Total Dahlia in garden 'B'} = 12 \times 180 \times \frac{10}{100} = 216$$

$$\text{Required difference} = 360 - 216 = 144$$

37. (a): Total illiterate population in cities D & E together

$$\text{in 2018} = \left(60,000 \times \frac{100-40}{100}\right) + \left(30,000 \times \frac{100-80}{100}\right)$$

$$= 36,000 + 6,000$$

$$= 42,000$$

Total illiterate population in cities B & C together

$$\text{in 2019} = \left(50,000 \times \frac{100-60}{100}\right) + \left(75,000 \times \frac{100-20}{100}\right)$$

$$= 20,000 + 60,000$$

$$= 80,000$$

$$\text{Required \%} = \frac{80,000 - 42,000}{80,000} \times 100$$

$$= 47.5\%$$

38. (c): Average number of illiterate populations in cities

$$B, D \text{ \& } E \text{ in 2019} = \frac{1}{3} \times \left(\left(50,000 \times \frac{100-60}{100}\right) + \right.$$

$$\left. \left(40,000 \times \frac{100-30}{100}\right) + \left(40,000 \times \frac{100-70}{100}\right) \right)$$

$$= \frac{1}{3} \times (20,000 + 28,000 + 12,000)$$

$$= 20,000$$

Literate population in cities A & C together in 2018

$$= \left(50,000 \times \frac{60}{100}\right) + \left(80,000 \times \frac{25}{100}\right)$$

$$= 30,000 + 20,000$$

$$= 50,000$$

$$\text{Required \%} = \frac{20,000}{50,000} \times 100$$

$$= 40\%$$

39. (d): Average number of literate populations in cities A,

$$B \text{ \& } C \text{ in 2019} = \frac{1}{3} \times \left(\left(60,000 \times \frac{55}{100}\right) + \left(50,000 \times \right. \right.$$

$$\left. \frac{60}{100}\right) + \left(75,000 \times \frac{20}{100}\right)$$

$$= \frac{1}{3} \times (33,000 + 30,000 + 15,000)$$

$$= 26,000$$

Total literate population in cities A, D & E together

$$\text{in 2018} = \left(50,000 \times \frac{60}{100}\right) + \left(60,000 \times \frac{40}{100}\right) +$$

$$\left(30,000 \times \frac{80}{100}\right)$$

$$= 30,000 + 24,000 + 24,000$$

$$= 78,000$$

$$\text{Required ratio} = \frac{26,000}{78,000}$$

$$= 1:3$$

40. (a): Total illiterate population in these five cities

$$\text{together in 2019} = \left(60,000 \times \frac{100-55}{100}\right) +$$

$$\left(50,000 \times \frac{100-60}{100}\right) + \left(75,000 \times \frac{100-20}{100}\right) +$$

$$\left(40,000 \times \frac{100-30}{100}\right) + \left(40,000 \times \frac{100-70}{100}\right)$$

$$= 27,000 + 20,000 + 60,000 + 28,000 + 12,000$$

$$= 1,47,000$$

Total population in these five cities together in

$$2018 = 50,000 + 40,000 + 80,000 + 60,000 + 30,000$$

$$= 2,60,000$$

$$\text{Required difference} = 2,60,000 - 1,47,000$$

$$= 1,13,000$$



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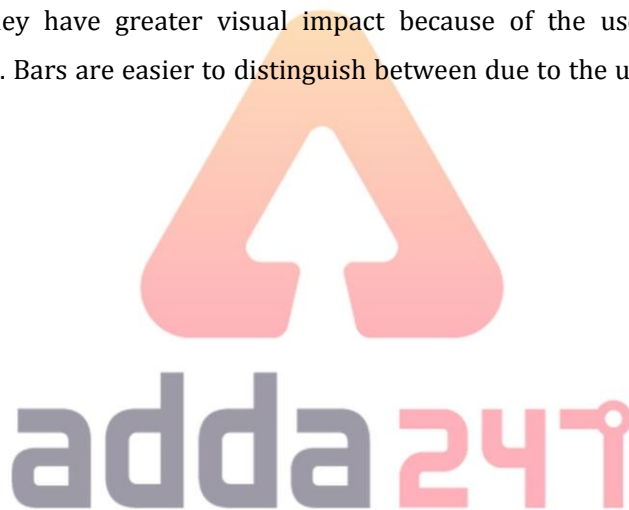
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Chapter 05

Bar Graph

Bar Graphs are the most commonly used method of representing data among the graphs which are drawn in the form of rectangular bars of uniform width with equal spaces between them. The length/height of the bars is proportional to the values they represent. These graphs are easy to understand and facilitate comparisons as they have greater visual impact because of the use rectangular bars and their proportional lengths/heights. Bars are easier to distinguish between due to the use colors, shades, dots, dashes etc. to represent them.

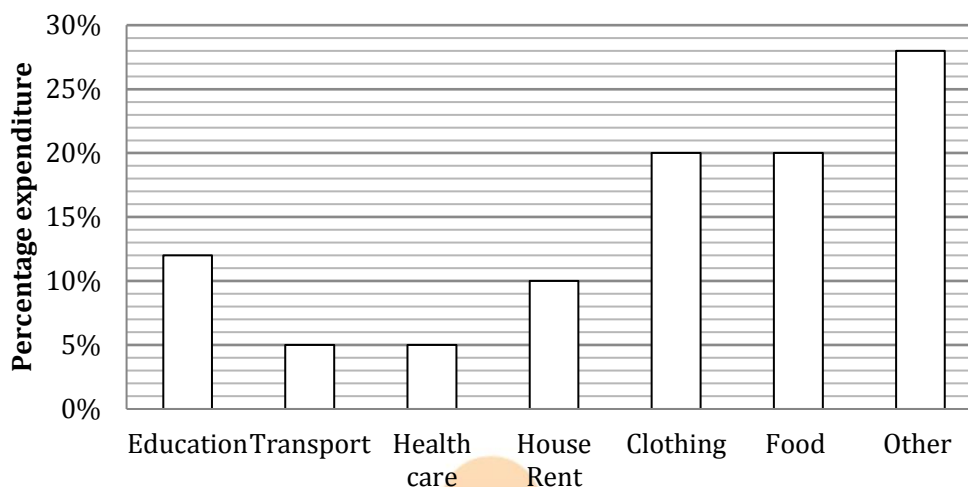


This chapter contains:

- Concept with Solved Examples
- Practice MCQs for Prelims
- Practice MCQs for Mains
- Previous Years' Questions of Prelims
- Previous Years' Questions of Mains

Solved Examples

Directions (1-5): Bar graph shown below shows the percentage of expenditure of a person in year 2016 on various things. Total expenditure in 2016 is 10 Lakh



1. If total expenditure of the person in 2016 is 80% of its Earnings then expenditure on Food is what percent of its total earnings.

(a) 10% (b) 12% (c) 14% (d) 15% (e) 16%

Sol. (e); $Total\ earnings = \frac{10}{80} \times 100 = 12.5\ L$

$$Required\ \% = \frac{\frac{20}{100} \times 10L}{12.5} \times 100 = 2 \times 8 = 16\%$$

2. What is the ratio of total expenditure on Food and House Rent together to the total expenditure on Education and transport together.

(a) 30 : 17 (b) 12 : 11 (c) 25 : 23 (d) 22 : 19 (e) 30 : 19

Sol. (a); Required ratio = $(20\% + 10\%) : (12\% + 5\%) = 30 : 17$

3. If house rent increase by 20% then expenditure on clothing should be reduced by what percent so that overall expenditure remains constant. (consider changes takes place only on expenditure on Clothing and House rent, All other expenditure remain constant)

(a) 8% (b) 7% (c) 9% (d) 10% (e) 12%

Sol. (d); $Increase\ in\ House\ rent = \frac{20}{100} \times \frac{10}{100} \times 10 = \frac{1}{5} \times \frac{1}{10} \times 10 = 0.2\ L$

$$Percentage\ decrease\ in\ expenditure\ on\ Clothing = \frac{0.2}{\frac{20}{100} \times 10} \times 100 = 10\%$$

4. Average of expenditure on Clothing and Food together is what percent of average of expenditure on 'others' and Education together.

(a) 75% (b) 100% (c) 805 (d) 90% (e) 95%

Sol. (b); Expenditure of Clothing and Food together = $(20\% + 20\%)$ of 10 L

Expenditure of Other & Education = $(20\% + 20\%)$ of 10 L

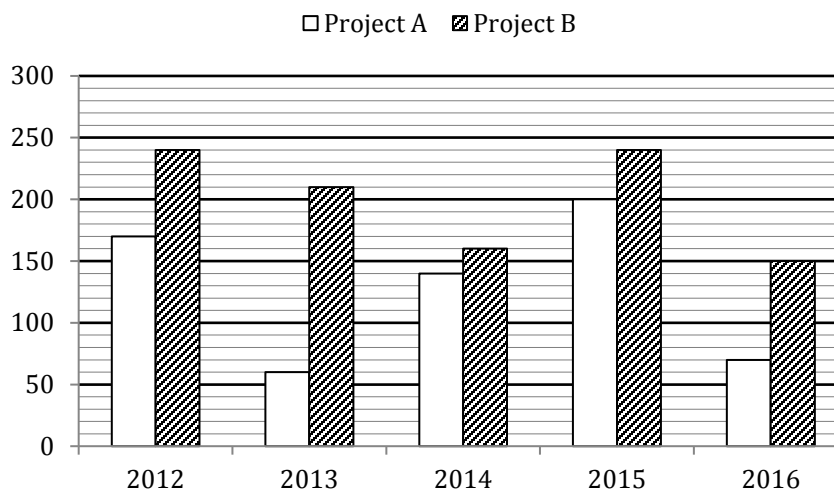
$$Required\ percentage = \frac{\frac{40\% \ of \ 10L}{2}}{\frac{40\% \ of \ 10L}{2}} \times 100 = 100\%$$

5. What will be the average of expenditure on all thing except Transport and Healthcare.

(a) 2L (b) 1.5 L (c) 1.8 L (d) 1 L (e) 2.5 L

Sol. (c); $Required\ average\ expenditure = \frac{90\% \ of \ 10L}{5} = \frac{90 \times 10}{100 \times 5} = 1.8\ L$

Directions (6-10): The bar-chart shows the total number of members enrolled in different years from 2012 to 2016 in two projects A and B. Based on this bar chart, solve the following questions.



6. If in the year 2017, there is 60% increase in the total number of members enrolled in 2016 in both Projects, then find the total number of members enrolled in 2017.

(a) 282 (b) 296 (c) 292 (d) 352 (e) None of these

Sol. (d); Total number of members enrolled in 2017 = 160% of $(150 + 70) = \frac{220 \times 160}{100} = 352$

7. The ratio of the total number of members of both project in 2013 to the total number of members in 2016 of both projects.

(a) 22 : 27 (b) 21 : 11 (c) 11 : 21 (d) 25 : 13 (e) 27 : 22

Sol. (e); $\text{Reqd ratio} = \frac{\text{No. of members in Project A and B in 2013}}{\text{No. of members in Project A and B in 2016}}$
 $= \frac{60+210}{70+150} = \frac{270}{220} = \frac{27}{22} = 27 : 22$

8. The number of members of Project A in 2013 is what per cent of the number of members of project B in 2016?

(a) 60% (b) 55% (c) 58% (d) 62% (e) 40%

Sol. (e); $\text{Reqd. \%} = \frac{\text{No. of members in Project A in 2013}}{\text{No. of members in Project B in 2016}} \times 100$
 $= \frac{60}{150} \times 100 = 40\%$

9. The number of members enrolled in Project A from 2013 to 2016 together is what per cent more than the number of members enrolled in Project B in 2015 and 2016 together? (Rounded off to two-digit decimal places)

(a) 10.51% (b) 20.51% (c) 15.51% (d) 17.51% (e) 22.51%

Sol. (b); Total number of members enrolled in Project A from 2013 to 2016 = $60 + 140 + 200 + 70 = 470$
 Total number of members enrolled in Project B in 2015 and 2016 together = $240 + 150 = 390$
 \therefore Difference = $470 - 390 = 80$
 $\therefore \text{Reqd \% more} = \frac{80}{390} \times 100 = 20.51\% \text{ more}$

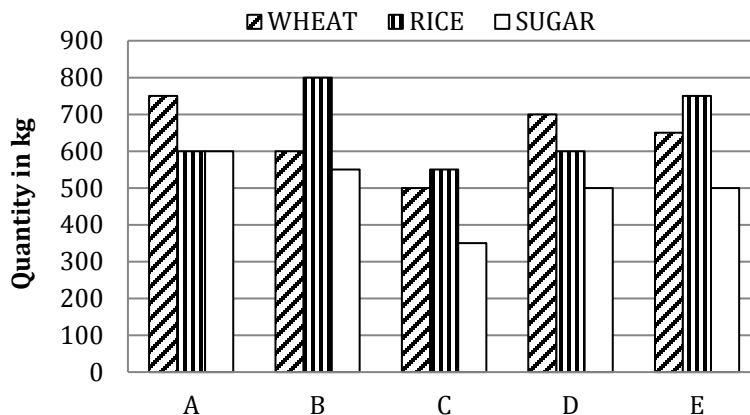
10. The total number of members enrolled in project B in 2015 and 2016 together is what per cent more or less than the number of members enrolled in project A in 2012 and 2016 together?

(a) 60% (b) 65% (c) 62.5% (d) 61.5% (e) 60.5%

Sol. (c); Total number of members enrolled in Project B in 2015 and 2016 together = $240 + 150 = 390$
 Total number of members enrolled in Project A in 2012 and 2016 = $170 + 70 = 240$
 \therefore Difference = $390 - 240 = 150$
 $\therefore \text{Reqd \%} = \frac{150}{240} \times 100 = 62.5\%$

Directions (11-15): Study the following graph and answer the question that follow

Given below is the amount of rice, wheat and sugar in (kg) sold by 5 different shopkeepers in year 2015



11. What is the ratio of total quantity of rice & wheat together sold by shopkeeper C together to the total quantity of sugar and wheat together sold by shopkeeper E together?

(a) 11 : 12 (b) 20 : 13 (c) 22 : 29 (d) 21 : 23 (e) 5 : 6

Sol. (d); Rice and wheat sold by C = $550 + 500 = 1050$

Sugar and wheat sold by E = $500 + 600 = 1150$

Required ratio = $\frac{1050}{1150} = \frac{21}{23}$

12. Amount of rice sold by shopkeeper A & B together is what percent more or less than the amount of wheat sold by shopkeeper C and E together?

(a) $22\frac{3}{5}\%$ (b) $29\frac{13}{17}\%$ (c) $21\frac{17}{23}\%$ (d) $19\frac{2}{7}\%$ (e) $20\frac{2}{7}\%$

Sol. (c); Amount of rice sold by shopkeeper A and B = 1400

Amount of wheat sold by shopkeeper C and E = 1150

Required % = $\frac{250}{1150} \times 100 = \frac{2500}{115} = 21\frac{17}{23}\%$

13. Which quantity out of the three-quantity sold by all the 5 shopkeepers together is maximum?

(a) Wheat (b) Rice (c) Sugar (d) Both a & b (e) None of these

Sol. (b); Total quantity of wheat sold by all = 3200 kg

Total quantity of rice sold by all = 3300 kg

Total quantity of sugar sold by all = 2500 kg

14. If total quantity of wheat and rice sold by all the shopkeeper together increases by 25% and $\frac{200}{33}\%$ respectively in year 2016 then in 2016 what is the difference between total quantity of wheat & rice sold by all shopkeeper?

(a) 200 kg (b) 100 kg (c) 400 kg (d) 100 kg (e) 500 kg

Sol. (e); Total wheat sold by all in 2016 = $\frac{125}{100} \times 3200 = 4000$ kg

Total rice sold by all in 2016 = $\left(100 + \frac{200}{33}\right)\% \times 3300$

$= \frac{35}{33} \times 3300 = 3500$ kg

Required difference = 500 kg

15. If the selling price per Kg of wheat and rice are in the ratio 3 : 5 (in Rs) in 2015 for shopkeeper A and selling price of wheat increases by 25% next year then what quantity of wheat was sold in 2016 by A if total amount obtained in selling wheat in 2016 by A is 11250 Rs. and amount obtained in selling rice by A in 2015 is 12000?

(a) 750 kg (b) 600 kg (c) 500 kg (d) 800 kg (e) 350 kg

Sol. (a); Let selling price of wheat in 2015 = $3x$ Rs/kg

Let selling price of rice in 2015 = $5x$

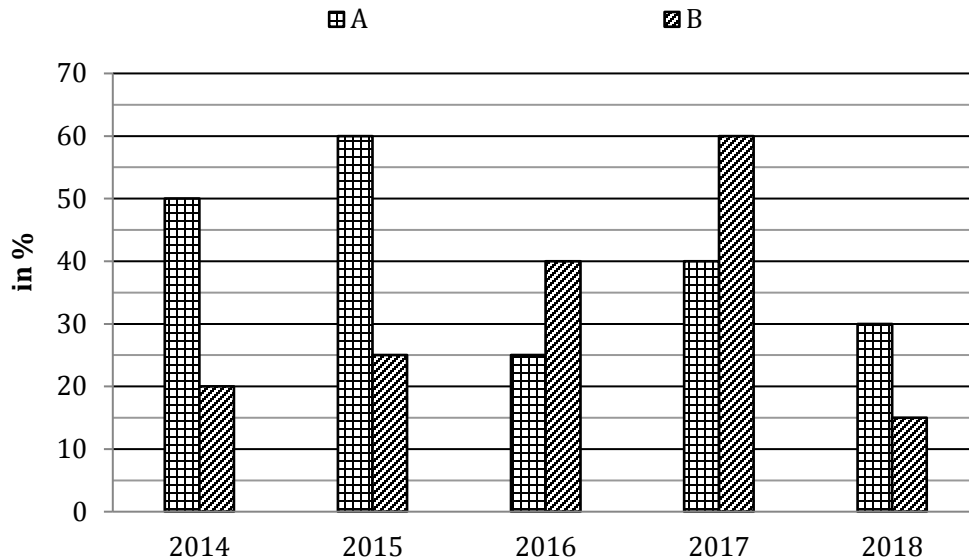
Selling price of wheat in 2016 = $\frac{5}{4} \times 3x \Rightarrow \frac{15x}{4}$

According to question $5x \times 600 = 12000 \Rightarrow x = 4$

Required value = $\frac{11250}{\frac{15}{4} \times 4} = 750$ kg

Directions (16-20): Study the bar chart given below and answer the following questions.

Bar chart shows the percentage of growth in revenue of company-A & B over 5 years period (2014-2018) with respect to previous year. Revenue of company - A & B at the end of 2013 is Rs.20000 & Rs.50000 respectively.



$$\text{Note - Profit \%} = \frac{\text{Revenue} - \text{Cost}}{\text{Cost}} \times 100$$

$$\text{loss \%} = \frac{\text{Cost} - \text{Revenue}}{\text{Cost}} \times 100$$

16. If in 2015 company-A earned 20% profit and company-B incurred loss of $6\frac{1}{4}\%$, then find overall profit or loss earned by company - A & B together in 2015.

(a) Rs.8000 (b) Rs.10000 (c) Rs.3000 (d) Rs.6000 (e) Rs.7000

Sol. (c): Revenue of company - A in 2015 = $20000 \times \frac{150}{100} \times \frac{160}{100} = \text{Rs. } 48000$

$$\text{Revenue of company - B in 2015} = 50000 \times \frac{120}{100} \times \frac{125}{100} = \text{Rs. } 75,000$$

ATQ,

$$\text{Profit earned by company - A} = 48000 \times \frac{20}{120} = \text{Rs. } 8000$$

$$\text{Loss incurred by company - B in 2015} = 75000 \times \frac{25}{4} \times \frac{4}{375} = \text{Rs. } 5000$$

$$\text{Required amount} = 8000 - 5000 = \text{Rs. } 3000$$

17. Find difference between average revenue of company-A in 2016 & 2017 and average revenue of company-B in 2014 & 2016.

(a) Rs.13000 (b) Rs.6000 (c) Rs.10000 (d) Rs.15000 (e) None of the above.

Sol. (e): Average revenue of company - A in 2016 & 2017

$$= \frac{1}{2} \times \left[20000 \times \frac{150}{100} \times \frac{160}{100} \times \frac{125}{100} + 20000 \times \frac{150}{100} \times \frac{160}{100} \times \frac{125}{100} \times \frac{140}{100} \right]$$

$$= \frac{1}{2} [60000 + 84000] = \text{Rs. } 72,000$$

Average revenue of company - B in 2014 & 2016 =

$$\frac{1}{2} \times \left[50000 \times \frac{120}{100} + 50000 \times \frac{120}{100} \times \frac{125}{100} \times \frac{140}{100} \right] = \frac{1}{2} [60000 + 105000] = \text{Rs. } 82,500$$

$$\text{Required difference} = 82500 - 72000 = \text{Rs. } 10500$$

18. Find percentage increase in revenue of company-A in 2018 as compared to revenue of company-A in 2014.

(a) 264% (b) 252% (c) 282% (d) 268% (e) 276%

Sol. (a): Revenue of company - A in 2018 = $20000 \times \frac{150}{100} \times \frac{160}{100} \times \frac{125}{100} \times \frac{140}{100} \times \frac{130}{100} = \text{Rs. } 1,09,200$

$$\text{Revenue of company - A in 2014} = 20000 \times \frac{150}{100} = \text{Rs. } 30,000$$

$$\text{Required \%} = \frac{109200 - 30000}{30000} \times 100 = \frac{79200}{300} \% = 264\%$$

19. If in 2017 company-B earned a profit of 12% and in 2018 company-A earned a profit of 4%, then find cost of company-A in 2018 is what percent of cost of company-B in 2017?

(a) 80% (b) 55% (c) 40% (d) 70% (e) 95%

Sol. (d): Revenue of company - B in 2017 = $50000 \times \frac{120}{100} \times \frac{125}{100} \times \frac{140}{100} \times \frac{160}{100} = \text{Rs. } 168000$

$$\text{Revenue of company - A in 2018} = 20000 \times \frac{150}{100} \times \frac{160}{100} \times \frac{125}{100} \times \frac{140}{100} \times \frac{130}{100} = \text{Rs. } 109200$$

ATQ,

$$\text{Cost of company - A in 2018} = 109200 \times \frac{100}{104} = \text{Rs. } 105000$$

$$\text{Cost of company - B in 2017} = 168000 \times \frac{100}{112} = \text{Rs. } 150000$$

$$\text{Required \%} = \frac{105000}{150000} \times 100 = 70\%$$

20. Find ratio of revenue earned by company-B in 2018 to revenue earned by company-A in 2017.

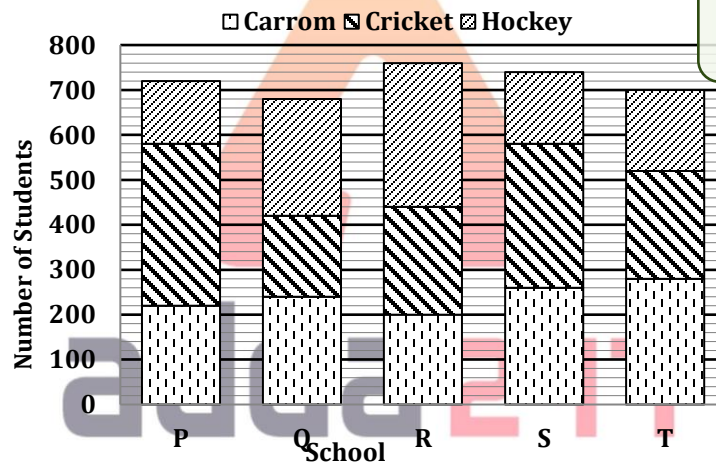
(a) 18 : 13 (b) 26 : 17 (c) 15 : 4 (d) 23 : 10 (e) None of the above.

Sol. (d): Required ratio = $\frac{50000 \times \frac{120}{100} \times \frac{125}{100} \times \frac{140}{100} \times \frac{160}{100} \times \frac{115}{100}}{20000 \times \frac{150}{100} \times \frac{160}{100} \times \frac{125}{100} \times \frac{140}{100}} = \frac{193200}{84000} = 23 : 10$

Q(21 -30) Bar graph solved examples of DI book

Directions (21 – 25): Study the following graphs and answer the given questions.

Number of Students Playing Carrom, Cricket and Hockey from five Different Schools.



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21. Total number of students playing Carrom and Hockey together from school P is what percent of the total number of students playing these two games together from school R?

(a) $68\frac{3}{16}\%$ (b) $64\frac{3}{13}\%$ (c) $69\frac{3}{13}\%$ (d) $63\frac{3}{13}\%$ (e) $62\frac{3}{13}\%$

Sol. (c): Number of students playing Carrom and Hockey together from school P = $220 + 140 = 360$

Number of students playing Carrom and Hockey together from school R = $200 + 320 = 520$

$$\text{Required \%} = \frac{360}{520} \times 100 = 69\frac{3}{13}\%$$

22. If the number of students playing each game in school S is increased by 15% and the number of students playing each game in school Q is decreased by 5%, then what will be the difference between number of students in schools S and Q?

(a) 54 (b) 218 (c) 356 (d) 224 (e) 205

Sol. (e): Total number of students in school S = $260 + 320 + 160 = 740$

Total number of students in school Q = $240 + 180 + 260 = 680$

$$\text{Required Difference} = \frac{115}{100} \times 740 - \frac{95}{100} \times 680$$

$$= 851 - 646 = 205$$

23. If out of the students playing Cricket from schools Q, S and T 40%, 35% and 45% respectively got selected for state level competition, what was the total number of students playing cricket got selected for State level competition from these schools together?

(a) 346 (b) 241 (c) 292 (d) 284 (e) 268

Sol. (c); Number of students playing cricket from,

School Q=180

School S=320

School T=240

$$\begin{aligned}\text{Required Students} &= \frac{40}{100} \times 180 + \frac{35}{100} \times 320 + \frac{45}{100} \times 240 \\ &= 72 + 112 + 108 = 292\end{aligned}$$

24. Total number of students playing Hockey from all schools together is approximately what percent of the total number of students playing Cricket from all schools together?

(a) 84% (b) 74% (c) 72% (d) 79% (e) 70%

Sol. (d); Total number of students playing Hockey from all school=140+260+320+160+180=1060

Total number of students playing cricket from all school=360+180+240+320+240=1340

$$\text{Required \%} = \frac{1060}{1340} \times 100 \approx 79\%$$

25. From school P, out of the students playing Carrom, 40% got selected for State level competition. Out of which 25% further got selected for National level competition. From school T, out of the students playing Carrom, 45% got selected for State level competition, out of which two-third further got selected for National level competition. What is the total number of students playing Carrom from these two schools who got selected for National level competition?

(a) 106 (b) 98 (c) 112 (d) 108 (e) 96

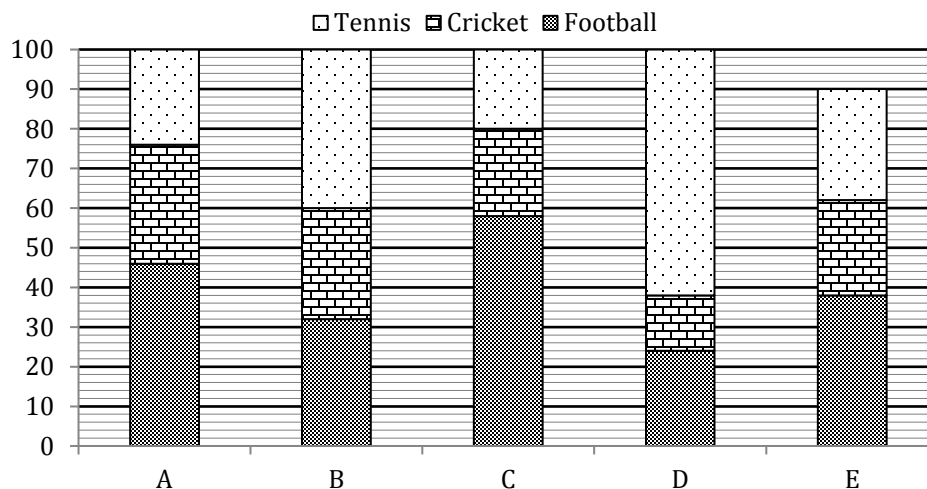
Sol. (a); Number of students playing Carrom from

school P=220

school T=280

$$\text{Required students} = \frac{25}{100} \times \frac{40}{100} \times 220 + \frac{2}{3} \times \frac{45}{100} \times 280 = 22 + 84 = 106$$

Directions (26-30): Bar graph shows Percentage distribution of number of students playing three different games in five different schools. Study the following bar graph and answer the following questions:



26. If the total number of students in college B are 4600 and the number of students in college C are $5\frac{1}{23}\%$ more than the number of students in college B then find the ratio of the students who play cricket from college B to the number of students who play Football from college C?

(a) 4125 : 8889 (b) 4025 : 8758 (c) 8758 : 4025 (d) 8889 : 4125 (e) 8758:4015

Sol. (b); Number of students in college C = $105\frac{1}{23}\%$ of 4600 = 4832

$$\text{Required ratio} = \left(\frac{28}{100} \times 4600\right) : \left(\frac{58}{100} \times 4832\right) = 12880 : 280256 = 4025 : 8758$$

27. Number of students who play Cricket from college B are what % less than the number of students who play Tennis and Football from the same college

(a) $59\frac{2}{3}\%$ (b) $61\frac{1}{9}\%$ (c) $63\frac{4}{9}\%$ (d) $62\frac{2}{3}\%$ (e) $60\frac{1}{9}\%$

Sol. (b); Required% = $\frac{72-28}{72} \times 100 = 61\frac{1}{9}\%$

28. Number of males who likes football from college D is same as number of females who likes Football from same college then find number of females who play football are what % of number of students who play Tennis from the same college?

(a) 21% (b) 23% (c) 20% (d) 14% (e) $19\frac{11}{31}\%$

Sol. (e); No. of females who play football from college D = $\frac{24}{2}\%$ = 12%

$$\text{Required\%} = \frac{12}{62} \times 100 = 19\frac{11}{31}\%$$

29. Find the average of the number of students who likes football and cricket from school C together if total number of students from college C are $81\frac{11}{69}\%$ of 6900.

(a) 2240 (b) 2245 (c) 2255 (d) 2250 (e) 2247

Sol. (a); Total no. of students from college C = $81\frac{11}{69}\%$ of 6900 = 5600

$$\text{Required average} = \frac{1}{2} \left[\frac{58+22}{100} \times 5600 \right] = \frac{1}{2} [4480] = 2240$$

30. Average number of student from college A and college E are 1240 and the ratio of the number of students from college A and college E are 3 : 2. Then number of students who likes football from college A are approximately what percent of the number of students who likes Tennis from college E ?

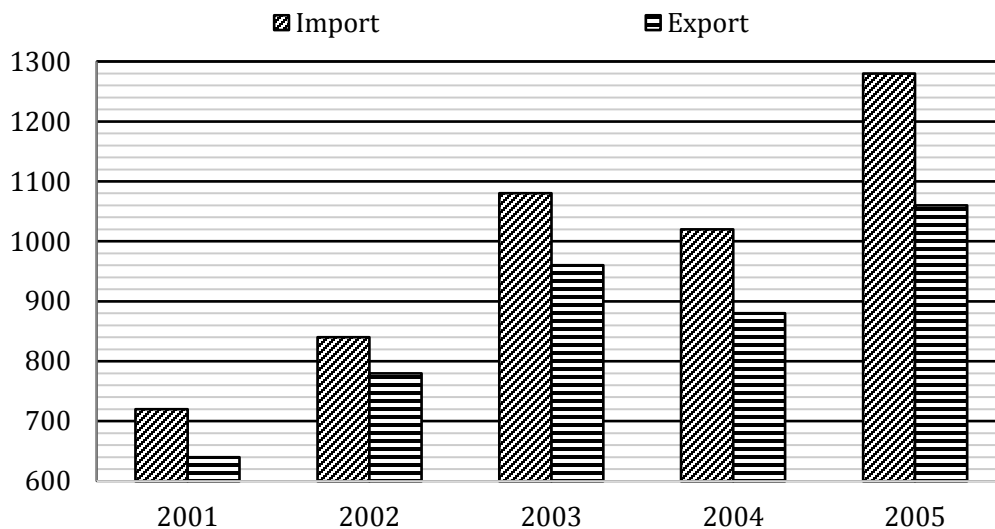
(a) 240% (b) 237% (c) 246% (d) 256% (e) 250%

Sol. (c); No. of students from college A = $\frac{3}{5} \times (1240 \times 2) = 1488$

$$\text{No. of students from college E} = \frac{2}{5} \times (1240 \times 2) = 992$$

$$\text{Required \%} = \frac{\frac{46}{100} \times 1488}{\frac{28}{100} \times 992} \times 100 = 246.43\%$$

Direction (31–35) : Given below bar graph shows Import (in hundred cr.) and export (in hundred cr.) of India to China during 2001 – 2005. Read the data carefully and answer the questions.



Trade deficit = Import – Export

31. The total imports are approximately what percent more than total exports in the given period?

(a) 18% (b) 8% (c) 20% (d) 14% (e) 24%

Sol. (d): Total imports in the given period = $(720 + 840 + 1080 + 1020 + 1280) \times 100 = 494000$ cr.
 Total exports in the given period = $(640 + 780 + 960 + 880 + 1060) \times 100 = 432000$ cr.
 Required percentage = $\frac{494000 - 432000}{432000} \times 100 = 14.35\% \approx 14\%$

32. Find the average of trade deficit in the given period?

- (a) 12000 cr. (b) 12400 cr. (c) 12800 cr. (d) 14400 cr. (e) 13600 cr.

Sol. (b): Trade deficit in 2001 = $(720 - 640) \times 100 = 8000$ cr.
 Trade deficit in 2002 = $(840 - 780) \times 100 = 6000$ cr.
 Trade deficit in 2003 = $(1080 - 960) \times 100 = 12000$ cr.
 Trade deficit in 2004 = $(1020 - 880) \times 100 = 14000$ cr.
 Trade deficit in 2005 = $(1280 - 1060) \times 100 = 22000$ cr.
 Required average = $\frac{8000 + 6000 + 12000 + 14000 + 22000}{5} = \frac{62000}{5} = 12400$ cr.

33. What is percentage increment in trade deficit in the year 2005 over the year 2003?

- (a) $77\frac{1}{3}\%$ (b) $83\frac{1}{3}\%$ (c) $85\frac{1}{3}\%$ (d) $87\frac{1}{3}\%$ (e) $89\frac{1}{3}\%$

Sol. (b): Trade deficit in 2003 = $(1080 - 960) \times 100 = 12000$ cr.
 Trade deficit in 2005 = $(1280 - 1060) \times 100 = 22000$ cr.
 Required percentage increment = $\frac{22000 - 12000}{12000} \times 100 = 83\frac{1}{3}\%$

34. Find the ratio of trade deficit in the year 2001 & 2005 together to Imports in the year 2001 & 2003 together?

- (a) 1 : 6 (b) 1 : 5 (c) 3 : 5 (d) 1 : 4 (e) 1 : 7

Sol. (a): Trade deficit in 2001 = $(720 - 640) \times 100 = 8000$ cr.
 Trade deficit in 2005 = $(1280 - 1060) \times 100 = 22000$ cr.
 Imports in the year 2001 & 2003 together = $(720 + 1080) \times 100 = 180000$ cr.
 Required ratio = $\frac{8000 + 22000}{180000} = 1 : 6$

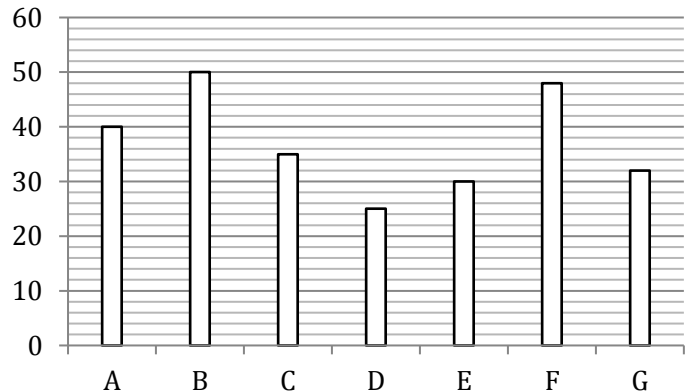
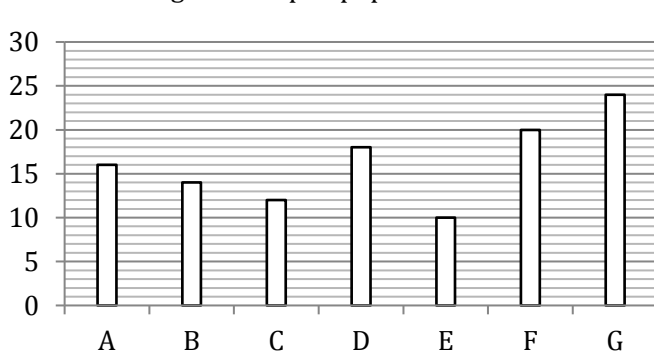
35. Total import in the year 2002 is what percent less than total export in the year 2005?

- (a) 16.75% (b) 20.75% (c) 24.75% (d) 28.75% (e) 32.75%

Sol. (b): Total import in 2002 = 84000 cr
 Total export in 2005 = 106000 cr
 Required percentage = $\frac{106000 - 84000}{106000} \times 100 = 20.75\%$

Direction (36 – 40): Given below bar graph (I) shows percentage breakup of population of six cities (A, B, C, D, E, F) and population of G given in absolute value (in hundred), while Bar graph (II) shows percentage of illiterate population in each city. Read the data carefully and answer the question.

□ Percentage breakup of population of seven cities



36. The average population of cities A, B & C is what percent less than the average population of cities D, E & F?

(a) 7.5% (b) 10% (c) 12% (d) 12.5% (e) 16%

Sol. (d): Total population of city A = $\frac{2400}{100-(16+14+12+18+10+20)} \times 16 = 3840$
 Total population of city B = $\frac{2400}{100-(16+14+12+18+10+20)} \times 14 = 3360$
 Total population of city C = $\frac{2400}{100-(16+14+12+18+10+20)} \times 12 = 2880$
 Average population of cities A, B & C = $\frac{3840+3360+2880}{3} = 3360$
 Total population of city D = $\frac{2400}{100-(16+14+12+18+10+20)} \times 18 = 4320$
 Total population of city E = $\frac{2400}{100-(16+14+12+18+10+20)} \times 10 = 2400$
 Total population of city F = $\frac{2400}{100-(16+14+12+18+10+20)} \times 20 = 4800$
 Average population of D, E & F = $\frac{4320+2400+4800}{3} = 3840$
 Required percentage = $\frac{3840-3360}{3840} \times 100 = 12.5\%$

- 37.** If total population of city A is increased by 50%, and population of city B is decreased by 25%, then find total population of cities A & B together is approximately what percent of total literate population of cities D & F together?
 (a) 148% (b) 128% (c) 144% (d) 138% (e) 150%

Sol. (c): Total population of city A = $\frac{2400}{100-(16+14+12+18+10+20)} \times 16 \times 1.5 = 5760$
 Total population of city B = $\frac{2400}{100-(16+14+12+18+10+20)} \times 14 \times 0.75 = 2520$
 Total population of A & B = $5760 + 2520 = 8280$
 Total literate population of city D = $\frac{2400}{100-(16+14+12+18+10+20)} \times 18 \times \frac{75}{100} = 3240$
 Total literate population of city F = $\frac{2400}{100-(16+14+12+18+10+20)} \times 20 \times \frac{52}{100} = 2496$
 Total literate population of city D & F = $3240 + 2496 = 5736$
 Required percentage = $\frac{8280}{5736} \times 100 = 144.35 \approx 144\%$

- 38.** Total illiterate population of cities B & D together is how much less than total literate population of cities A & F together?
 (a) 1880 (b) 2040 (c) 2404 (d) 2208 (e) 2200

Sol. (b): Total illiterate population of B = $\frac{2400}{100-(16+14+12+18+10+20)} \times 14 \times \frac{1}{2} = 1680$
 Total illiterate population of D = $\frac{2400}{100-(16+14+12+18+10+20)} \times \frac{25}{100} = 1080$
 Total literate population of A = $\frac{2400}{100-(16+14+12+18+10+20)} \times 16 \times \frac{60}{100} = 2304$
 Total literate population of F = $\frac{2400}{100-(16+14+12+18+10+20)} \times 20 \times \frac{52}{100} = 2496$
 Required difference = $(2304 + 2496) - (1680 + 1080) = 2040$

- 39.** The ratio of literate male to literate female in city C is 13 : 11 and that in city G is 5 : 11, then find difference between literate female in both the cities?
 (a) 288 (b) 240 (c) 256 (d) 244 (e) 264

Sol. (e): Total literate female in the city C = $\frac{2400}{100-(16+14+12+18+10+20)} \times 12 \times \frac{65}{100} \times \frac{11}{24} = 858$
 Total literate female in the city G = $2400 \times \frac{68}{100} \times \frac{11}{16} = 1122$
 Required difference = $1122 - 858 = 264$

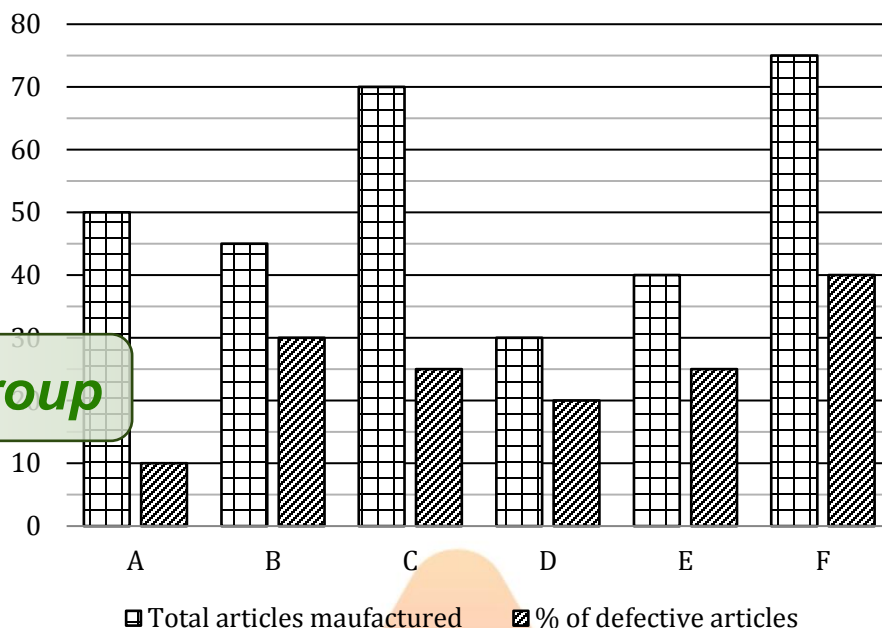
- 40.** Total illiterate male in the city E is 36% of total literate male in city D, then find the total illiterate female in city E is what percent of total literate female in city D?
 (a) 18% (b) 16% (c) 26% (d) Can't be determined (e) 32%

Sol. (d): Since we don't know the gender distribution of given city or any of given city, then we cannot determine the given percentage.

Directions (41-46): Study the chart given below and answer the following questions.

Bar chart shows the number of articles (in '000) manufactured by 6 different companies (A, B, C, D, E & F) in 2017 and percentage of defective articles out of total manufactured articles of these companies in 2017.

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Note – Total articles manufactured by a company = Total defective articles of a company + Total non-defective articles of a company.

41. Find average number of articles manufactured by company-B & F are what percent of defective articles of company-A & E together?

- (a) 400% (b) 250% (c) 450% (d) 350% (e) 300%

Sol. **(a):** Average number of articles manufactured by company – B & F = $\frac{1}{2}[45000 + 75000]$
= 60000

$$\text{Defective articles of company – A \& E together} = \left[50000 \times \frac{10}{100} + 40000 \times \frac{25}{100} \right]$$

$$= 5000 + 10000 = 15000$$

$$\text{Required\%} = \frac{60000}{15000} \times 100 = 400\%$$

42. Find average number of non-defective articles manufactured by company-D, E & F.

- (a) 40000 (b) 33000 (c) 36000 (d) 31000 (e) 45000

Sol. **(b):** Total non-defective articles of company – D, E & F

$$= \left[30000 \times \frac{80}{100} + 40000 \times \frac{75}{100} + 75000 \times \frac{60}{100} \right]$$

$$= 24000 + 30000 + 45000 = 99000$$

$$\text{Required average} = \frac{99000}{3} = 33000$$

43. Defective articles of company-D & F together is what percent more or less than non-defective articles of company-A?

- (a) 30% (b) 40% (c) 10% (d) 50% (e) 20%

Sol. **(e):** Defective articles of company – D & F together = $\left[30000 \times \frac{20}{100} + 75000 \times \frac{40}{100} \right]$
= 6000 + 30000 = 36000

$$\text{Non-defective articles of company – A} = 50000 \times \frac{90}{100} = 45000$$

$$\text{Required\%} = \frac{45000 - 36000}{45000} \times 100$$

$$= \frac{9000}{45000} \times 100 = 20\%$$

44. If company-B sells non-defective articles at Rs.10/unit and defective article at Rs.4/unit, then find total revenue of company-B.

(a) Rs. 3.62 lacs (b) Rs. 3.75 lacs (c) Rs. 3.85 lacs (d) Rs. 3.69 lacs (e) Rs. 3.81 lacs

Sol. (d): Revenue of company – B from non-defective articles = $10 \times 45000 \times \frac{70}{100}$
= Rs. 315000

Revenue of company – B from defective articles = $4 \times 45000 \times \frac{30}{100}$ = Rs. 54000

Required amount = 315000 + 54000 = Rs. 369000 = Rs. 3.69 lacs

45. If manufacturing cost of company-C is Rs.20/unit and ratio of per unit selling price of non-defective articles to that of defective articles is 5 : 2, then find revenue of company-C from defective articles (company earned Rs.87500 on selling all manufactured articles).

(a) Rs.182000 (b) Rs.187000 (c) Rs.179000 (d) Rs.175000 (e) None of the above.

Sol. (d): Total manufacturing cost of company – C = 70000×20 = 14,00,000 Rs.

Total revenue of company – C = 14,00,000 + 87,500 = Rs. 14,87,500

Let selling price of each defective unit and each non-defective unit of company – C be Rs. 2x & Rs. 5x respectively.

ATQ,

$$70000 \times \frac{25}{100} \times 2x + 70000 \times \frac{75}{100} \times 5x = 1487500$$

$$35000x + 262500x = 1487500$$

$$297500x = 1487500$$

$$x = 5$$

$$\text{So, required revenue} = 70000 \times \frac{25}{100} \times 2 \times 5 = \text{Rs. 175000}$$

46. Articles manufactured by company-C & D together are how much more or less than articles manufactured by company-A & E together?

(a) 10000 (b) 35000 (c) 18000 (d) 27000 (e) 25000

Sol. (a): Articles manufactured by company – C & D together = 70000 + 30000
= 100000

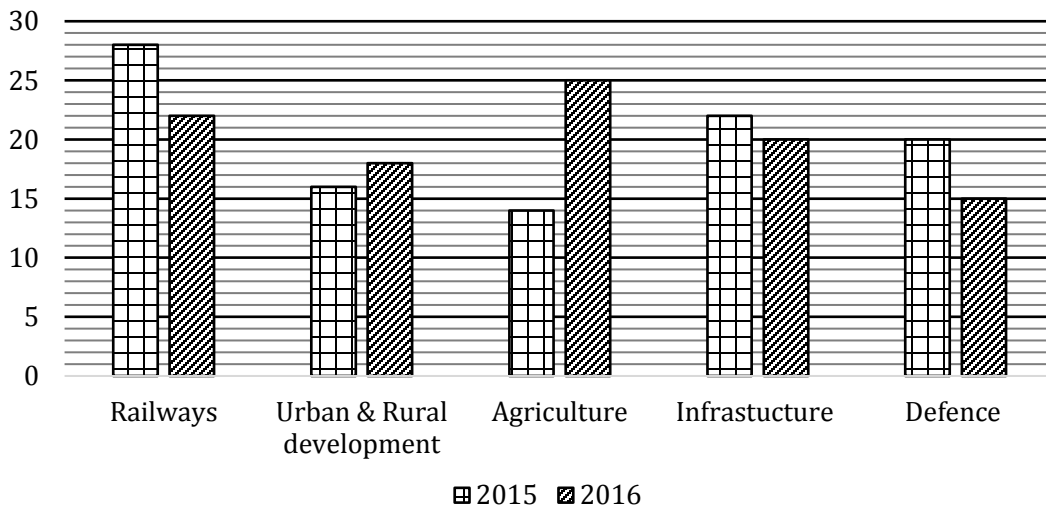
Article manufactured by company – A & E together = 50000 + 40000 = 90000

Required difference = 100000 – 90000 = 10000

Direction (47 – 50): Given below bar chart shows percentage distribution of budget (in cr.) allotted in five different areas in 2015 and in 2016. Read the data carefully and answer the following questions.

Note: Ratio between total budget allotted in 2015 to 2016 is 3 : 4.

distribution of budget (in cr)



47. If difference between total budget allotted for Railways & infrastructure in the year 2015 is Rs. 2160 cr and total budget allotted in 2017 is 25% more than that of in 2016, while percentage distribution of budget allotted for these five different areas in 2017 remains same as year 2016, then find difference between total budget allotted for Urban & Rural development in the year 2017 & budget allotted for Defence in the year 2016? (
- (a) 4500 cr. (b) 4800 cr. (c) 5200 cr. (d) 3600 cr. (e) 5600 cr.

Sol. (d): Let total budget allotted in 2015 and 2016 is $3x$ and $4x$ respectively

ATQ –

$$3x \times \frac{28}{100} - 3x \times \frac{22}{100} = 2160$$

$$\frac{84x}{100} - \frac{66x}{100} = 2160$$

$$18x = 216000$$

$$x = 12000 \text{ cr}$$

$$\text{Total budget allotted in 2016} = 4 \times 12000 = 48000 \text{ cr}$$

$$\text{Total budget allotted in 2017} = 48000 \times \frac{125}{100} = 60000 \text{ cr}$$

$$\text{Required difference} = 60000 \times \frac{18}{100} - 48000 \times \frac{15}{100} = 3600 \text{ cr}$$

48. 30% and 45% of total budget allotted for agriculture in the year 2015 & 2016 respectively is used for urban agriculture and remaining budget allotted for rural agriculture. If sum of budget allotted for rural agriculture in both the years is Rs. 20256 cr., then find total budget allotted for Railway & infrastructure in both the given years?

(a) 76300 cr. (b) 79400 cr. (c) 75400 cr. (d) 76320 cr. (e) 71250 cr.

Sol. (d): Let total budget allotted in 2015 and 2016 is $3x$ and $4x$ respectively

$$3x \times \frac{14}{100} \times \frac{(100-30)}{100} + 4x \times \frac{25}{100} \times \frac{(100-45)}{100} = 20256 \text{ cr}$$

$$0.2940x + 0.55x = 20256 \text{ cr}$$

$$0.844x = 20256 \text{ cr}$$

$$x = 24000 \text{ cr}$$

Total budget allotted for Railway & infrastructure in both the given years

$$= 24000 \times 3 \times \frac{(28+22)}{100} + 24000 \times 4 \times \frac{(22+20)}{100}$$

$$= 36000 + 40320$$

$$= 76320 \text{ cr.}$$

49. The percentage distribution for budget allotted for these five areas in the year 2017 is same as in the year 2016. If sum of total budget allotted for agriculture in the year 2016 & infrastructure in 2017 is Rs. 14200 cr. and total budget allotted for Railways in the year 2016 is Rs. 760 cr. more than total budget allotted for Defence in the year 2017, then find total budget allotted in the year 2015?

(a) 12800 cr. (b) 21000 cr. (c) 22000 cr. (d) 23000 cr. (e) 10400 cr.

Sol. (b): Let total budget allotted in 2016 and 2017 is x and y respectively

ATQ –

$$x \times \frac{25}{100} + y \times \frac{20}{100} = 14200$$

$$5x + 4y = 284000 \text{ ----- (i)}$$

$$\text{And, } x \times \frac{22}{100} - y \times \frac{15}{100} = 760$$

$$22x - 15y = 76000 \text{ ----- (ii)}$$

From (i) + (ii) we get

$$x = 28000 \text{ cr.}$$

$$\text{Total budget allotted in 2015} = 28000 \times \frac{3}{4} = 21000 \text{ cr.}$$

50. If there is an increment of 25% in total budget allotted for the year 2017 from previous year and increment of 20% in total budget allotted for the year 2018 over 2017 and percentage distribution for 2017 is same as 2015, while for 2018 is same as 2016. If total budget allotted for Infrastructure from 2015 to 2018 is Rs. 60160 cr., then find total budget allotted for railways in the year 2017 & 2018 together?

(a) 43640 cr. (b) 43420 cr. (c) 43560 cr. (d) 43520 cr. (e) 43600 cr.

Sol. (d): Let total budget allotted in 2015 and 2016 is $3x$ and $4x$ respectively

So, total budget allotted in 2017 = $4x \times \frac{125}{100} = 5x$

And, total budget allotted in 2018 = $5x \times \frac{120}{100} = 6x$

ATQ –

$$3x \times \frac{22}{100} + 4x \times \frac{20}{100} + 5x \times \frac{22}{100} + 6x \times \frac{20}{100} = 60160$$

$$0.66x + 0.80x + 1.10x + 1.2x = 60160$$

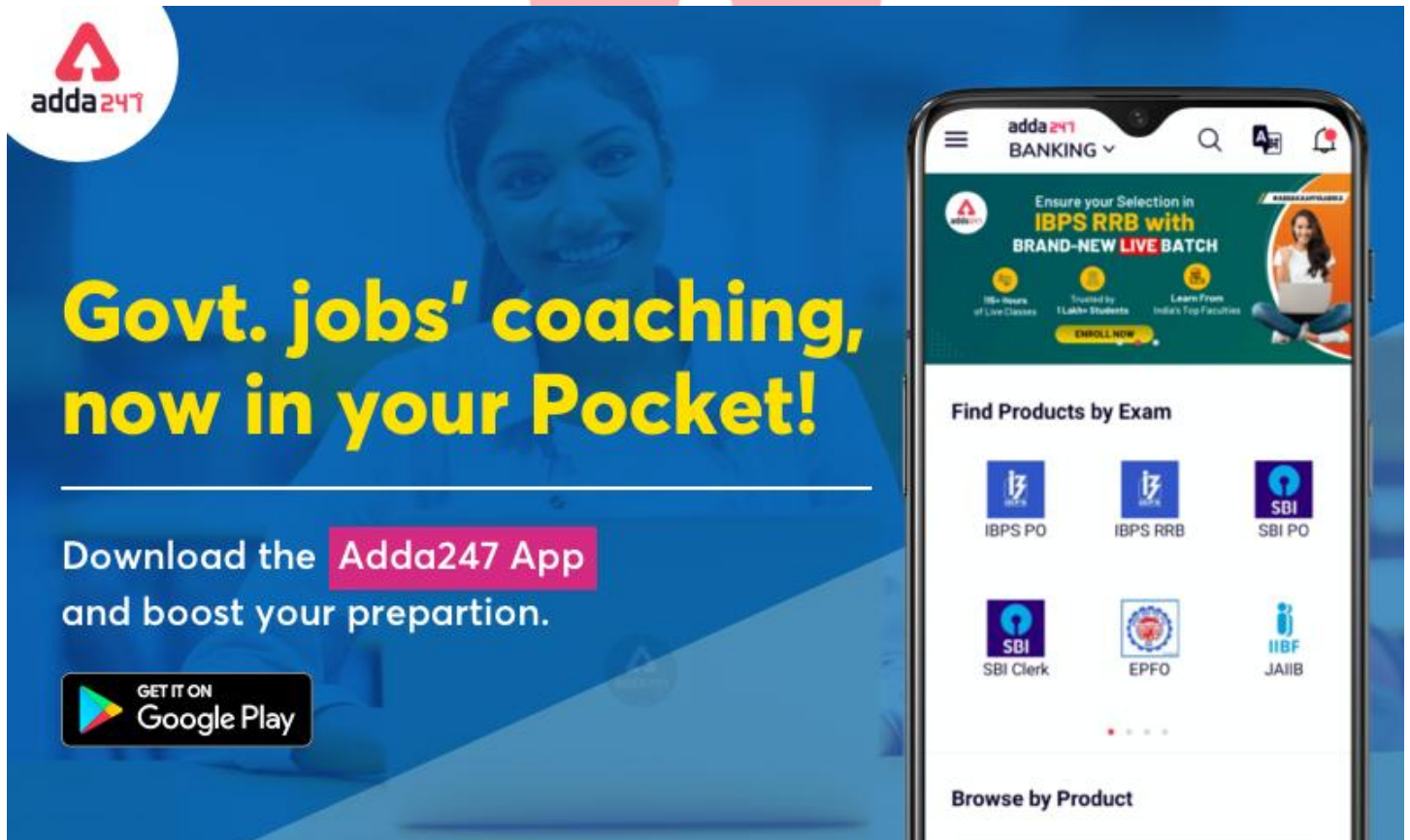
$$3.76x = 60160$$

$$x = 16000 \text{ cr.}$$

Total budget allotted for railways in the year 2017 & 2018

$$= 16000 \times 5 \times \frac{28}{100} + 16000 \times 6 \times \frac{22}{100}$$

$$= 22400 + 21120 = 43520 \text{ cr}$$

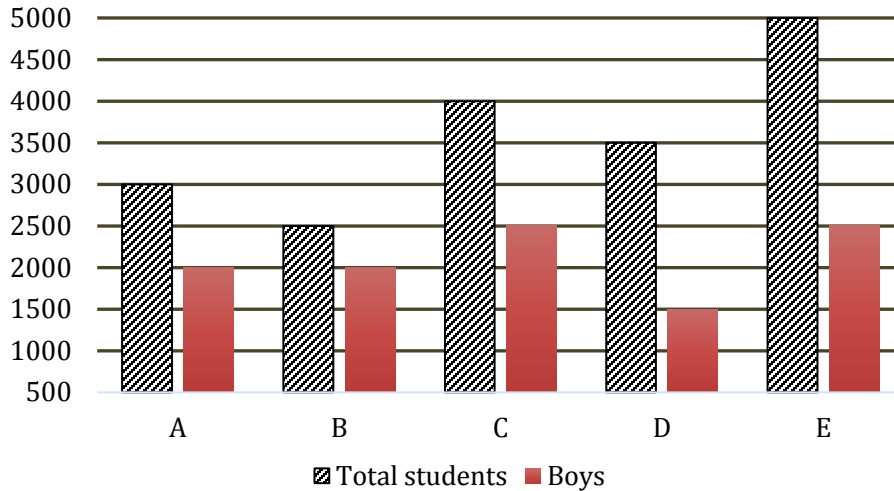


The advertisement features a large background image of a smiling woman. In the top left corner is the Adda247 logo. The main text in large yellow font reads "Govt. jobs' coaching, now in your Pocket!". Below this, it says "Download the Adda247 App and boost your preparation." with a "GET IT ON Google Play" button. On the right, a smartphone displays the app's interface, which includes a header with the Adda247 logo and "BANKING" category, a banner for "IBPS RRB with BRAND-NEW LIVE BATCH", and a section titled "Find Products by Exam" listing various exams like IBPS PO, IBPS RRB, SBI PO, SBI Clerk, EPFO, and JAIIB. At the bottom of the phone screen, it says "Browse by Product".

Practice MCQs for Prelims

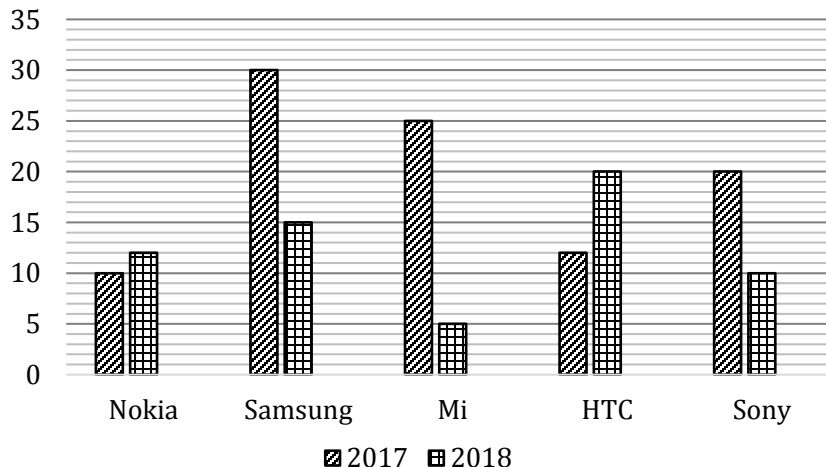
Directions (1-5) :- The given bar graph shows the total no. of students of 5 different schools and no. of boys from each school.

Study the graph carefully and answer the following questions.



- What is the ratio between no. of boys of school B and no. of girls of school C?
(a) 4 : 3 (b) 1 : 1 (c) 5 : 4 (d) 3 : 4 (e) 4 : 5
- No. of girls of school B and C together is what percent of total students of school A?
(a) 150% (b) 125% (c) 100% (d) 66.67% (e) 75%
- What is the average no. of boys in school A, B, C and E?
(a) 1800 (b) 2250 (c) 2300 (d) 1950 (e) 2875
- Girls in school A and B together are what percent more/less than girls of school B and D together?
(a) 60% (b) 50% (c) 40% (d) 70% (e) 80%
- No. of boys in school B and E together are how much more/less than girls in school A, C and D together?
(a) 500 (b) 1000 (c) 1500 (d) 2000 (e) 0

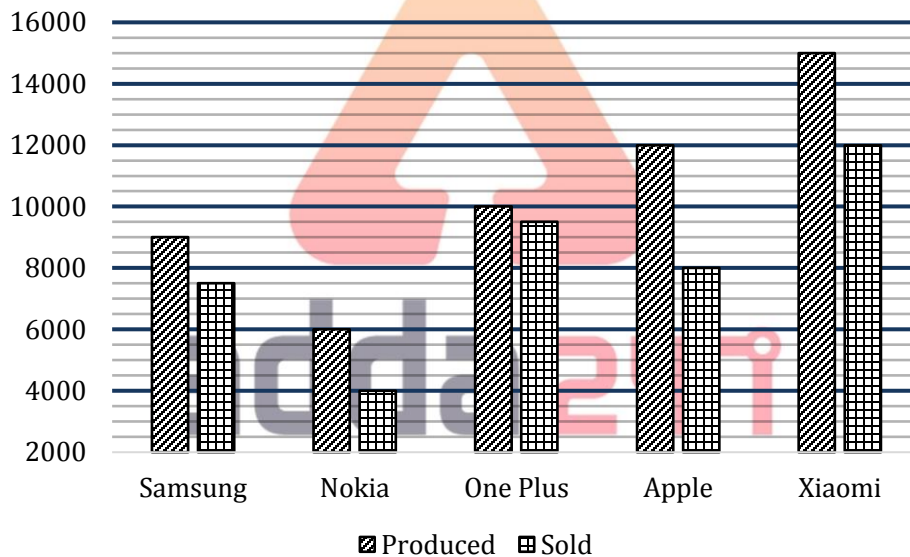
Directions (6-11): - Bar graph given below shows number of mobile phones ('000) sold in 2017 and percentage increase in sales of these mobile phones in 2018 as compared to previous year of 5 different companies. Read the data carefully and answer the following question.



6. Find the number of phones sold by Nokia and Samsung together in 2018.
 (a) 48400 (b) 43200 (c) 45700 (d) 41900 (e) 47500
7. No. of Mi mobile sold in 2017 are what percent more than no. of Sony mobile sold in same year?
 (a) 20% (b) 12% (c) 14% (d) 30% (e) 25%
8. No. of HTC mobile sold in 2018 are how much more/less than no. of Sony mobile sold in 2017?
 (a) 5600 less (b) 6600 more (c) 5600 more (d) 6600 less (e) None of these.
9. If no. of Mi mobile sold in 2016 are 30% less than Mi mobile sold in 2017, find ratio between Samsung mobile sold in 2018 and Mi mobile sold in 2016?
 (a) 17:12 (b) 67:35 (c) 69:35 (d) 69:37 (e) 19:17
10. What is average no. of MI and HTC mobiles sold in year 2018?
 (a) 20325 (b) 17325 (c) 18050 (d) 19050 (e) None of these.
11. Increase in sales of HTC and Sony mobile together in 2018 over previous year is what percent of no. of Nokia mobile sold in 2017?
 (a) 45% (b) 54% (c) 34% (d) 44% (e) 38%

Directions (12-16) :- Study the given bar graph carefully and answer the following questions.

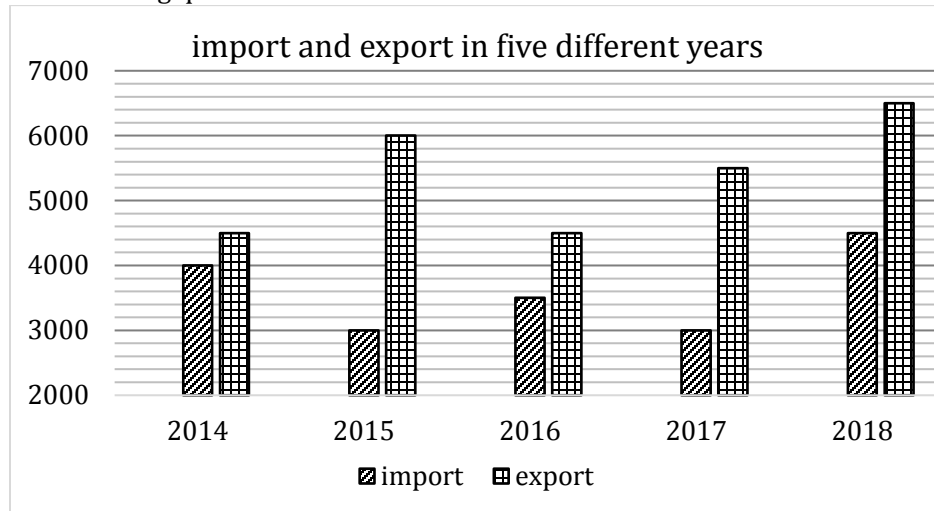
The bar graph given below shows the produced and sold units of mobiles by 5 different companies in a month.



Note – Total produced mobiles in a month of each company = Total (sold + unsold) mobiles of that company in that month.

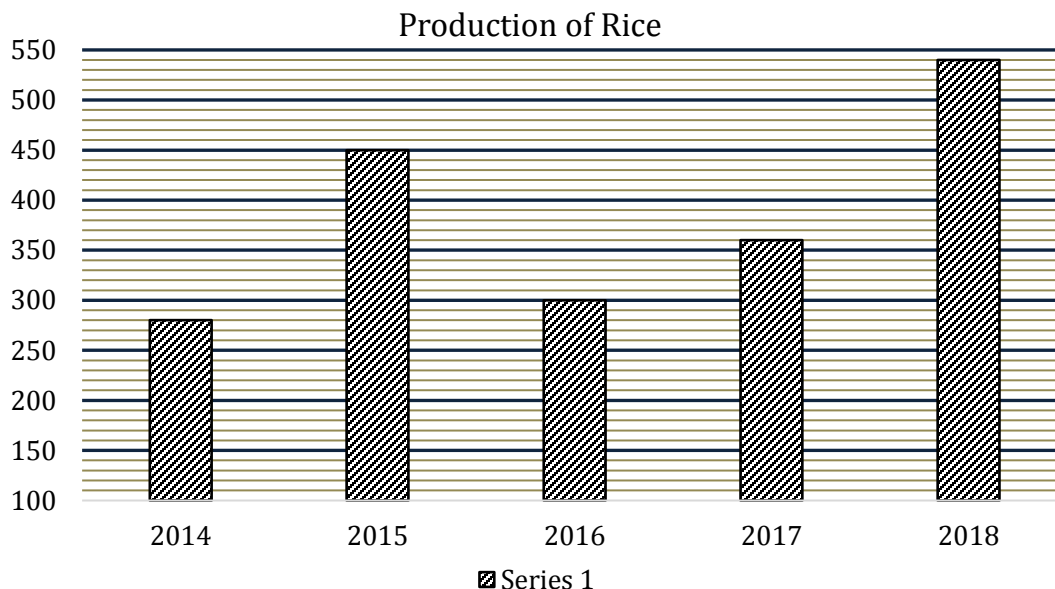
12. Sold units of Xiaomi mobile is how much more/less than sold units of Samsung?
 (a) 2500 (b) 3500 (c) 3000 (d) 4500 (e) 1500
13. Mobiles produced by Samsung and Nokia together are what percent more than mobiles produced by Apple?
 (a) 80% (b) 75% (c) 60% (d) 40% (e) 25%
14. What is average no. of unsold units of Samsung, Nokia and Apple?
 (a) 2666 (b) 3500 (c) 2500 (d) 1500 (e) 1750
15. Sold units of Samsung is what percentage of unsold units of Nokia and Apple together?
 (a) 125% (b) 80% (c) 150% (d) 75% (e) 100%
16. If market price of each sold mobile of One plus and Apple are in the ratio of 4 : 5 respectively, then find the ratio between revenue of One plus to Apple.
 (a) 19 : 25 (b) 19 : 20 (c) 20 : 17 (d) 20 : 19 (e) 17 : 19

Directions (17-21): - Bar graph given below shows import and export of a company in five different years. Read the data carefully and answer the following questions.



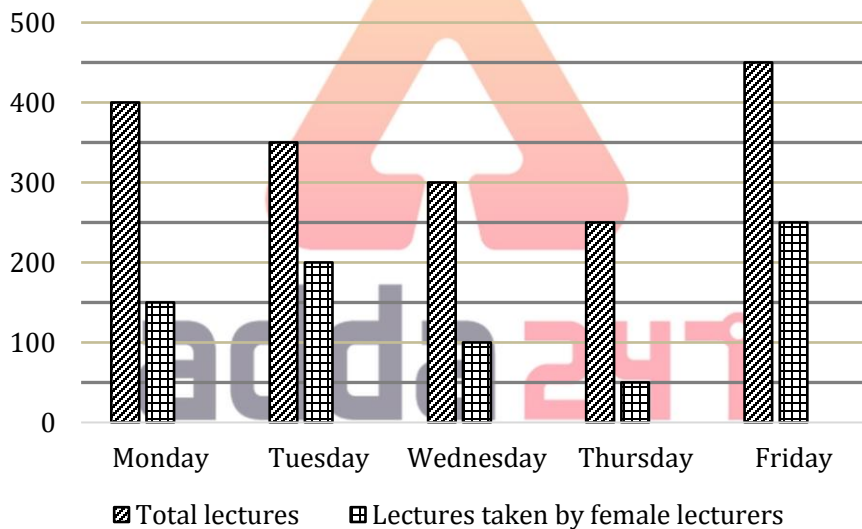
- 17.** Maximum import in any of the given years is how much percent less than maximum export in any of the given year? (right up to 2 decimal places)
 (a) 20.17% (b) 30.77% (c) 25.67% (d) 16.67% (e) 20.85%
- 18.** What is the ratio of difference between export and import in year 2016 to import in year 2015?
 (a) 1:2 (b) 1:3 (c) 2:3 (d) 4:5 (e) None of these.
- 19.** Difference between export and import in year 2014 is what percent of import in year 2016 and 2018 together?
 (a) 12.5% (b) 25% (c) 9% (d) 16.67% (e) 6.25%
- 20.** What is the average of import in 2014 and 2018 together and export in 2016 and 2017 together?
 (a) 7250 (b) 9250 (c) 8750 (d) 6250 (e) None of these.
- 21.** What is the difference between decrease percentage of import from year 2014 to 2015 and decrease percentage in export from year 2015 to 2016?
 (a) 10% (b) 2% (c) 5% (d) 4% (e) 0%

Directions (22-27): - The bar graph given below show the production of Rice (in ton) in a village in five different years. Study the graph carefully and answer the following questions.



22. Rice produced in 2016 is what percent of that in 2018? (up to two decimals)
 (a) 46.66% (b) 75% (c) 180% (d) 55.55% (e) 33.33%
23. Find the average production of Rice in given period.
 (a) 276 ton (b) 324 ton (c) 386 ton (d) 364 ton (e) 426 ton
24. What is percentage rise or fall in production of Rice in 2018 from 2015?
 (a) 15% (b) 20% (c) 35% (d) 25% (e) 30%
25. What is the ratio of Rice produced in 2014 and 2016 together to that in 2017 and 2018 together?
 (a) 29 : 45 (b) 30 : 41 (c) 28 : 43 (d) 29 : 47 (e) 45 : 29
26. Rice produced in 2016 is what percentage more or less than that in 2017?
 (a) 25% (b) 16.67% (c) 33.33% (d) 12.5% (e) 20%
27. Production of rice in 2014 and 2017 together is how much more or less than that in 2015, 2016 and 2018 together?
 (a) 450 ton (b) 350 ton (c) 650 ton (d) 750 ton (e) 550 ton

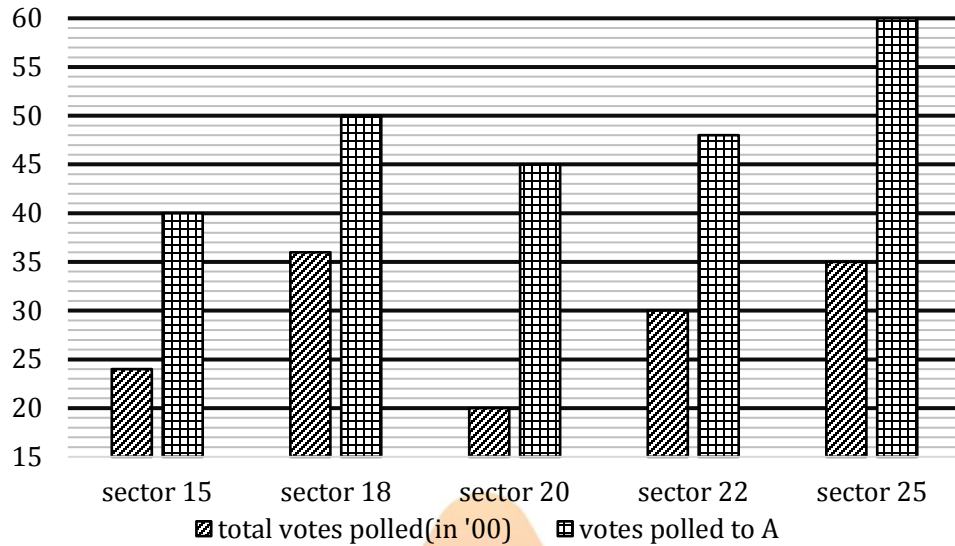
Direction (28 – 31): Bar graph given below shows total number of lectures conducted in 'IIM Lucknow' in five different days and total number of lectures taken by female lecturers in these five days. Read the data carefully and answer the questions.



28. Total lectures taken by male lecturers in Friday is what percent more than total lectures taken by male lecturers in Tuesday?
 (a) $30\frac{1}{3}\%$ (b) $33\frac{1}{3}\%$ (c) $37\frac{1}{2}\%$ (d) 30% (e) 40%
29. Find the ratio of total lectures taken by female lecturers in Wednesday to total lectures taken by male lecturers in Monday?
 (a) 3 : 4 (b) 3 : 5 (c) 2 : 7 (d) 2 : 5 (e) 2 : 3
30. If 40% of the total lectures taken by male lecturers on Thursday is taken by male having age above than 50 years, then find difference between total lectures taken by male lecturers having age below 50 years and total lectures taken by female lecturers in that day?
 (a) 90 (b) 80 (c) 50 (d) 60 (e) 70
31. Find average number of lectures taken by male lecturers in Monday, Tuesday and Friday?
 (a) 200 (b) 150 (c) 300 (d) 250 (e) 100

Direction (32-35): Read the given information carefully and answer the following questions.

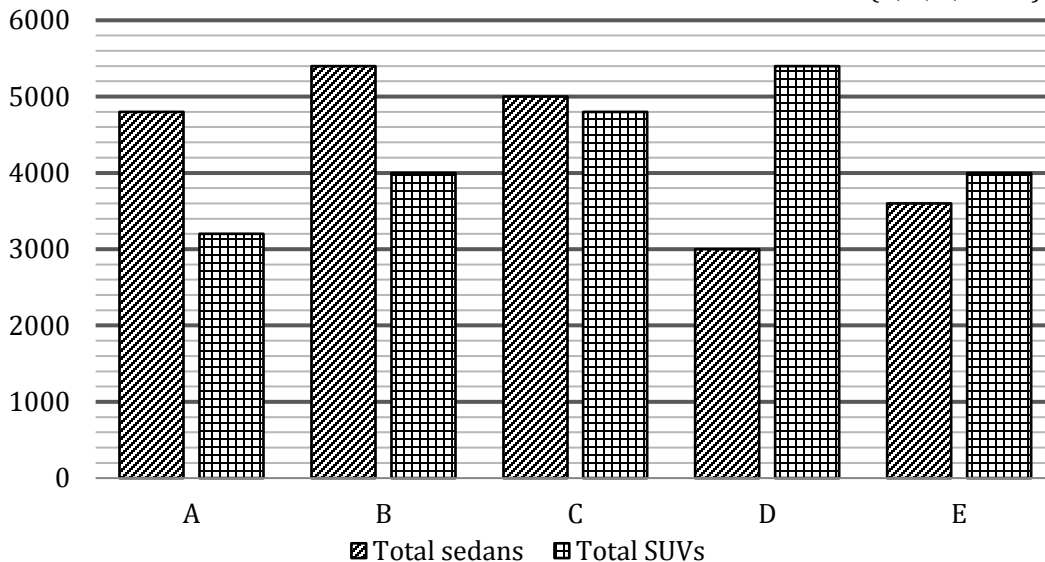
The following bar graph shows total votes polled (in '00) and percentage of votes polled to A in five different sectors of Noida (There are only two candidates i.e. A & B in the election).



32. Find the average of votes polled in sector 15, sector 18 and sector 22?
 (a) 2700 (b) 3000 (c) 2800 (d) 3200 (e) 3100
33. Find the total number of votes polled to B in sector 20 and sector 25 together?
 (a) 2600 (b) 2800 (c) 2700 (d) 2400 (e) 2500
34. Find the difference between total votes polled to A and that polled to B in sector 18, sector 20 & sector 25 together?
 (a) 500 (b) 400 (c) 600 (d) 300 (e) 200
35. Find the average of votes polled to A in all these five sectors?
 (a) 1380 (b) 1420 (c) 1440 (d) 1480 (e) 1470

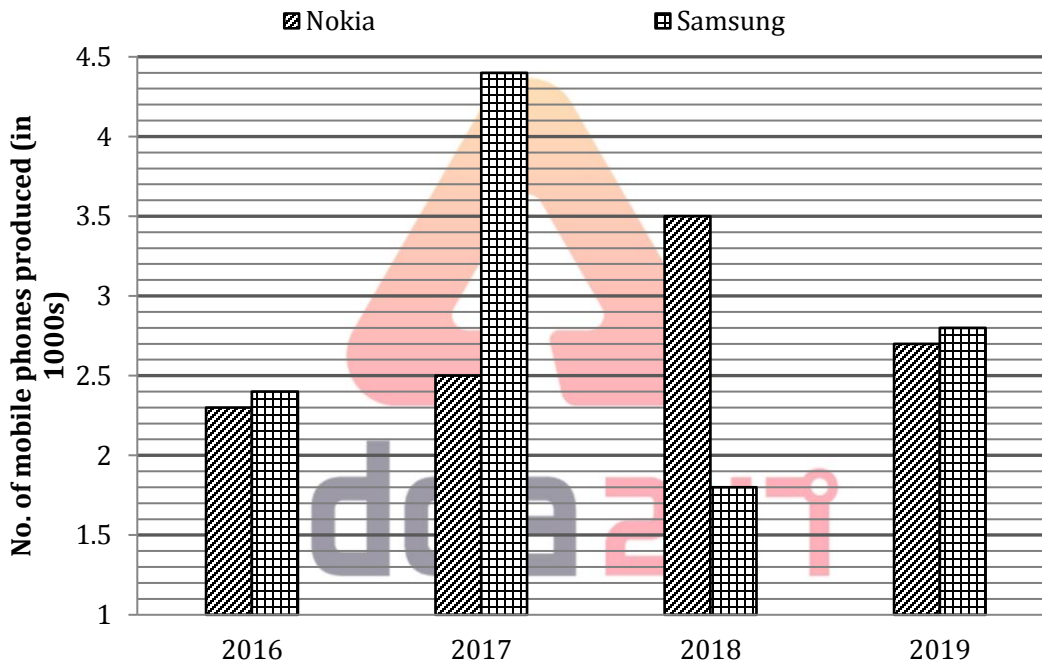
Directions (36-39): Study the bar chart given below and answer the following questions.

Bar chart shows the total number of sedans and total number of SUVs in 5 different cities (A, B, C, D & E) in 2018.



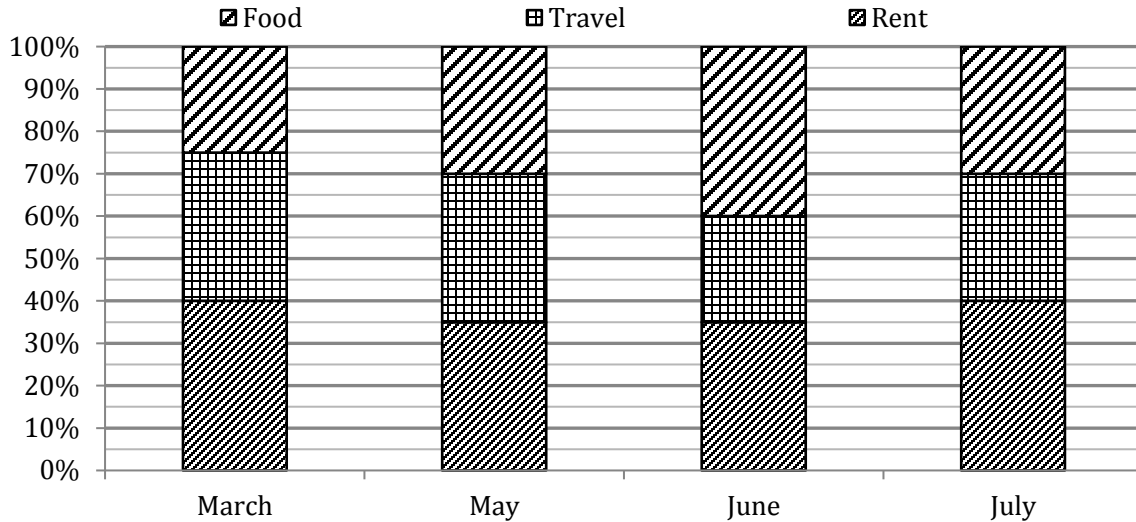
36. Total number of sedans in A & E together is what percent more or less than total number of SUVs in B & E together?
 (a) 40% (b) 25% (c) 5% (d) 30% (e) 15%
37. Find ratio of total sedans in C & D together to total SUVs in A & D together.
 (a) 40:43 (b) 35:41 (c) 24:35 (d) 43:40 (e) 35:24
38. Total number of SUVs in C & D together is how much more or less than total number of sedans in B & E together?
 (a) 1600 (b) 1200 (c) 1500 (d) 600 (e) 900
39. If total number of hatchbacks in D are 20% less than total number of sedans in C, then find total number of hatchbacks in D are how much more or less than total number of sedans in A?
 (a) 800 (b) 500 (c) 1800 (d) 1400 (e) 700

Directions (40-44):- Given bar graph shows the production of mobile phones by Nokia & Samsung in 4 years. Study the data carefully and answer the questions.



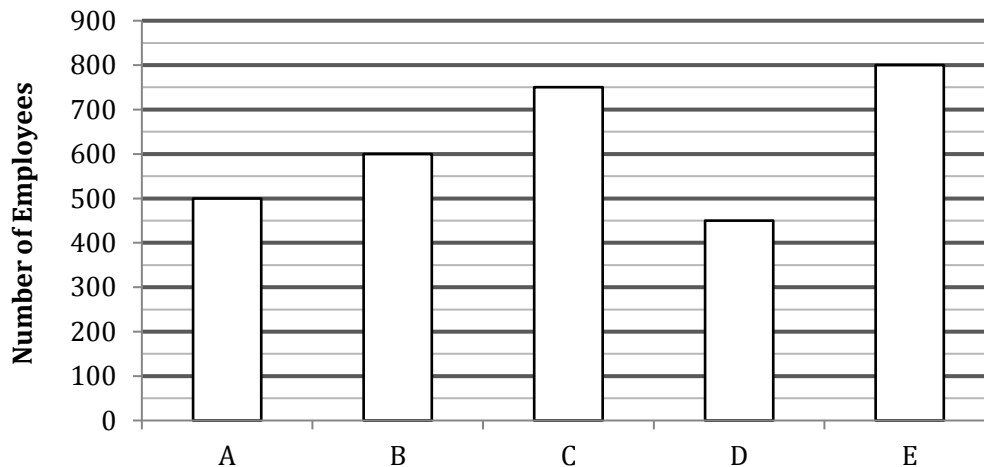
40. How many mobile phones have been produced of Samsung over all the years?
 (a) 10800 (b) 11600 (c) 11400 (d) 11000 (e) 11200
41. Nokia mobiles produced in 2016 & 2017 together are how much more than Samsung mobiles produced in 2018 & 2019?
 (a) 800 (b) 100 (c) 400 (d) 300 (e) 200
42. Samsung mobiles produced in 2018 are what percent of Nokia mobiles produced in 2019?
 (a) None of these (b) 60% (c) 75% (d) $66\frac{2}{3}\%$ (e) $68\frac{2}{3}\%$
43. What is the ratio of Nokia mobiles produced in 2016, 2017 & 2018 together to Samsung mobiles produced in 2016, 2017 & 2019 together?
 (a) 83:96 (b) 35:32 (c) 83:86 (d) 96:83 (e) None of these
44. In which year the increase in production was maximum as compared to previous year & for which company?
 (a) Nokia, 2017 (b) Nokia, 2018 (c) Samsung, 2019 (d) Nokia, 2019 (e) Samsung, 2017

Directions (45-49):- Given bar graph shows the data of expenses (in % distribution) of Mr. Chunky in 4 months on rent, travel & food. Study the graph carefully and answer the questions.



45. If salary of Mr. Chunky is Rs. 12000 in July and his savings is half of his expenditure on rent. Find his expenditure on food. (in Rs.)
 (a) 3500 (b) 2000 (c) 4000 (d) 3000 (e) 4500
46. If savings and salary of Mr. Chunky are same for all the given months then expenditure on travel in March is what percent of expenditure on food in June?
 (a) 87.5% (b) 85% (c) 90% (d) 92.5% (e) None of these
47. If ratio of total expenditure in May & July is 5:4. Find ratio of expenditure on rent in May to expenditure on travel in July.
 (a) 3:2 (b) 6:7 (c) 7:6 (d) 24:35 (e) 35:24
48. Income of Chunky in March & July is Rs. 5000 & Rs. 8000 of which he saves only 10% in each month. What is his average expenditure on rent in these 2 months?
 (a) Rs. 2400 (b) Rs. 2300 (c) Rs. 2340 (d) Rs. 2430 (e) Rs. 2360
49. Expenditure on travel in May is what percent more than expenditure on travel in July if total expenditure for both the months is same?
 (a) 15% (b) 12.5% (c) 16.67% (d) 20% (e) 10%

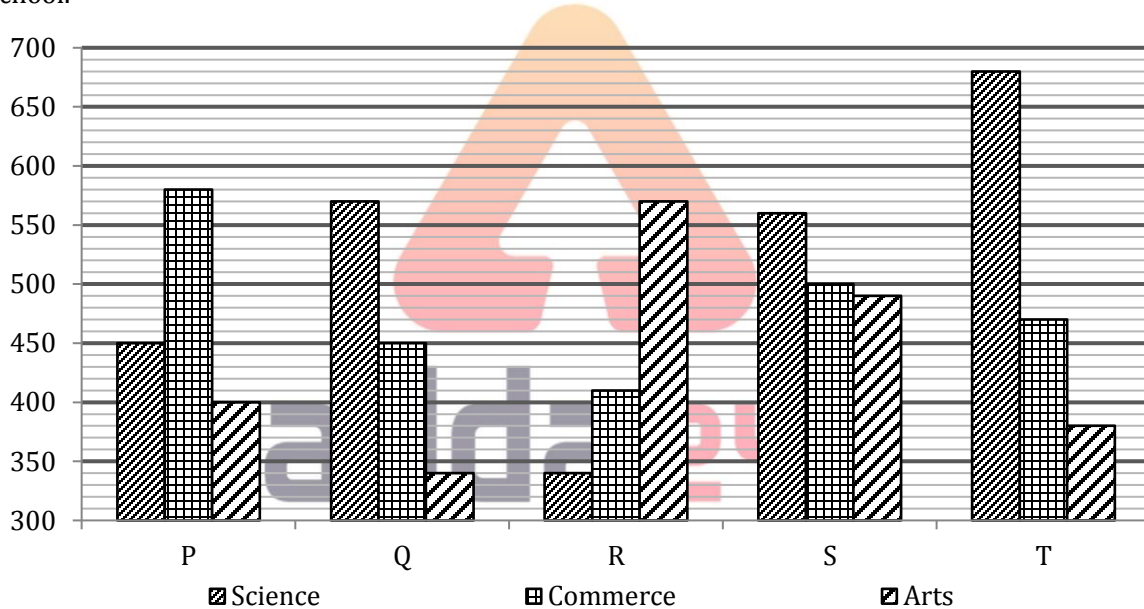
Directions (50-54):- Given bar graph shows the number of employees in 5 different companies. Study the graph carefully and answer the following questions.



Note – Total employees in any company = Total (Male + Female) employees in that company.

50. There are 50% males in company A. females in company A are what percent of total employees of company C?
 (a) 25% (b) $37\frac{5}{7}\%$ (c) $38\frac{5}{7}\%$ (d) $33\frac{5}{7}\%$ (e) $33\frac{1}{3}\%$
51. What is average number of employees of company B, D & E?
 (a) 602.67 (b) 650 (c) 616.67 (d) 623.67 (e) 625
52. What is difference between average no. of employees in company A & C and average no. of employees in company B & D?
 (a) 130 (b) 100 (c) 90 (d) 110 (e) 105
53. Ratio of male to female employees in company D & E is 8:7 and 7:3 respectively. Find total number of female employees in both the companies
 (a) 430 (b) 470 (c) 500 (d) 450 (e) 460
54. In another company F, males are 60% of total employees in company B while females are 70% of total employees in company D. find total number of employees in company F.
 (a) 675 (b) 600 (c) 650 (d) 690 (e) 655

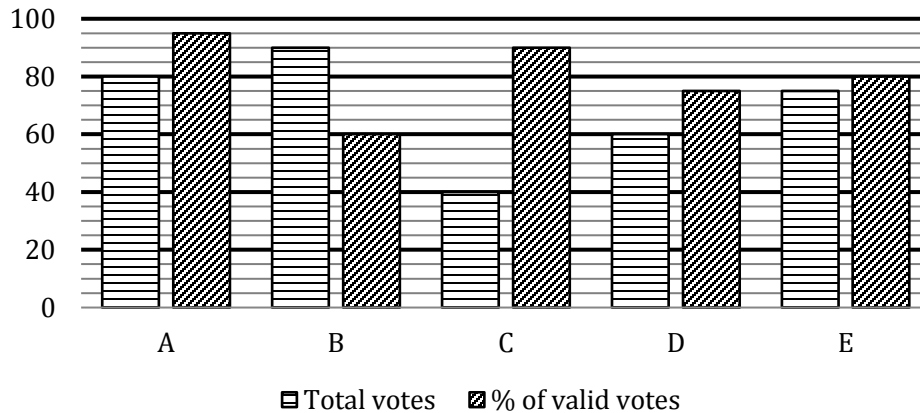
Directions (55-59):- Given bar graph shows the data of number of students who took admission in 3 different streams of 5 different school.



55. Find the difference of average number of students in Science, Commerce and Arts stream in school T and average number of students in Science, Commerce and Arts stream in school R?
 (a) 70 (b) 80 (c) 60 (d) 75 (e) 100
56. Total student of science stream from school P, Q and R together is how much more/less than total students of Arts stream from schools R, S and T together?
 (a) 90 (b) 100 (c) 60 (d) 80 (e) 70
57. Total students of arts stream from school Q and T together is what percentage of total students of science stream from school R and S together?
 (a) 70% (b) 75% (c) 80% (d) 85% (e) 65%
58. Find the ratio of total science stream students from school S and T together to total commerce students from school Q and T together?
 (a) 31:23 (b) 32:23 (c) 23:31 (d) 23:32 (e) 28:15
59. Find the average number of commerce students in all the schools?
 (a) 492 (b) 472 (c) 482 (d) 502 (e) 460

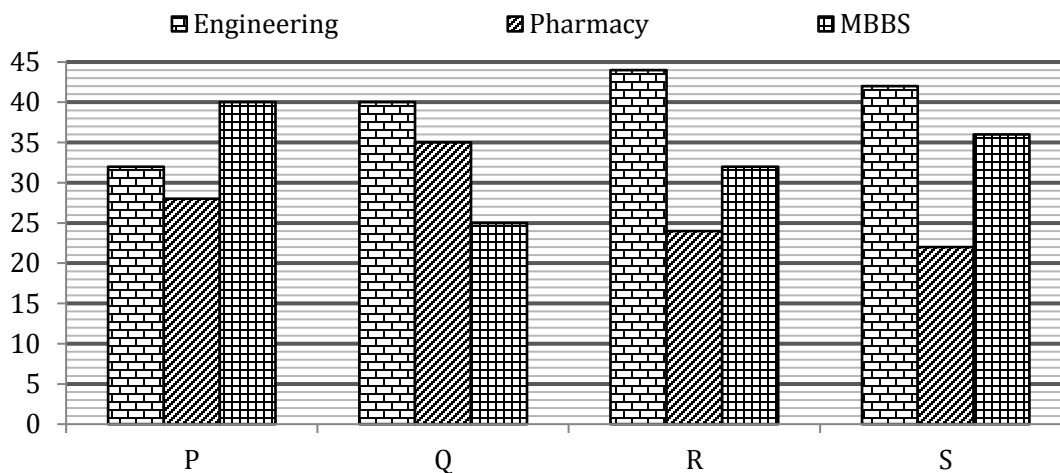
Directions (60-64): Study the bar chart given below and answer the following questions.

Bar chart shows the total votes (in '000) in 5 different cities (A, B, C, D & E) and percentage of valid votes out of total votes in these 5 cities.



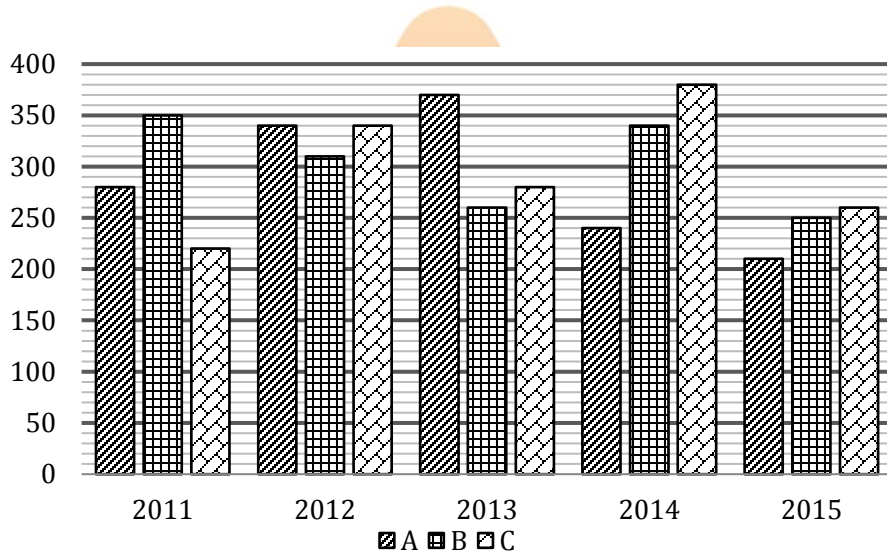
- 60.** In A, ratio of valid votes received by BJP, INC & SP is 11 : 3 : 5. If BJP win the election by 24000 votes, then find valid votes received by INC & SP together.
 (a) 28000 (b) 40000 (c) 45000 (d) 32000 (e) 21000
- 61.** If in D there are only two parties-BJP & INC and BJP got 70% of the total valid votes, then find by how many votes BJP won the election in D.
 (a) 18000 (b) 25000 (c) 10000 (d) 16000 (e) 6000
- 62.** If in E INC got 15000 more valid votes than AAP and BJP won the election by 15000 votes, then find the valid votes received by BJP. (There are only three parties in E – BJP, INC & AAP)
 (a) 40000 (b) 38000 (c) 45000 (d) 35000 (e) 30000
- 63.** In B there are only two parties – BJP & INC. If BJP got 60% of total votes in B and ratio of invalid votes received by BJP and INC is 2 : 1, then find valid votes received by INC in B.
 (a) 24000 (b) 27000 (c) 22000 (d) 20000 (e) 25000
- 64.** In C there are four parties – BJP, INC, SP & AAP. If ratio of valid votes received by BJP, INC, SP & AAP in C is 4 : 2 : 3 : 3 and ratio of invalid votes received by BJP, INC, SP & AAP in C is 1 : 3 : 4 : 2, then find difference between total votes received by INC & SP in C.
 (a) 2000 (b) 3500 (c) 3400 (d) 2100 (e) 2700

Directions (65-69):- Given bar graph shows the percentage distribution of total number of students of each school (P, Q, R & S) who took admission in 3 different streams. Total students in P, Q, R & S are 700, 800, 400 & 900 respectively.



65. What is average number of students who have opted for MBBS in all the 4 colleges?
 (a) 256 (b) 233 (c) 284 (d) 224 (e) 296
66. What is the ratio of the total number of student who have opted for both engg. and MBBS stream together in college Q to that of in same stream together in college R?
 (a) 38:65 (b) 67:35 (c) 35:67 (d) 65:38 (e) 29:37
67. The number of students who have opted for MBBS in college P is what percent of the number of students who have opted for the engg. in college Q?
 (a) 87.5% (b) 50% (c) 75% (d) 100% (e) 62.5%
68. What is the ratio of the no. of students who have opted for engg. in college R to that of those who have opted for same stream in college P?
 (a) 14:11 (b) 17:13 (c) 11:14 (d) 13:17 (e) None of these
69. Which of the combination represents the colleges with maximum number of students, who have opted for pharmacy and those who have opted for engg. respectively?
 (a) P & R (b) Q & S (c) Q & R (d) R & S (e) P & Q

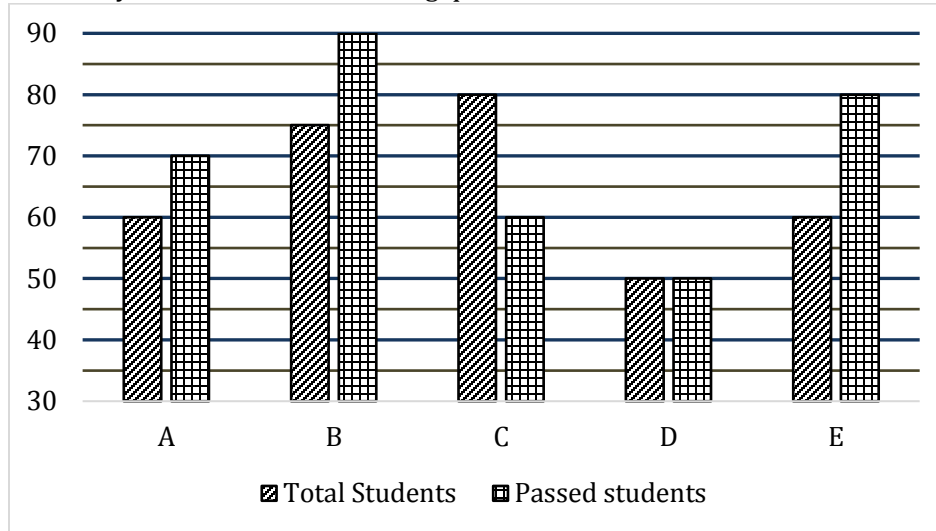
Directions (70-74):- Given bar graph shows the details of number of students in a particular class of 3 different schools in 5 different years.



70. What is the difference between average number of students of school A across all the years and the average number of students of school B across all the years?
 (a) 18 (b) 10 (c) 12 (d) 14 (e) 16
71. Find the respective ratio of the total number of students of school A in 2011 and 2012 together to the total number of students of school C in 2013 and 2014 together?
 (a) 31:33 (b) 47:55 (c) 55:47 (d) 33:31 (e) 31:37
72. If in 2016, the total number of students in School A, School B and School C increases by 10%, 20% and 15% respectively as compared to 2015, then find the total number of students in 2016 in all the schools together?
 (a) 850 (b) 870 (c) 780 (d) 830 (e) 800
73. Total students of all the school together in 2013 is approximately what percentage more/less than the total students of school B in 2011 and 2015 together?
 (a) 52% (b) 59% (c) 56% (d) 63% (e) 48%
74. Find the difference between the number of total students from all the schools in 2011 and 2013 together and the total number of students from all the schools in 2014 and 2015 together?
 (a) 140 (b) 60 (c) 120 (d) 80 (e) 100

Directions (75-79):- The bar graph given below shows number of students (in '00) of five different school (A, B, C, D and E) and no. of passed student (in %) in each school.

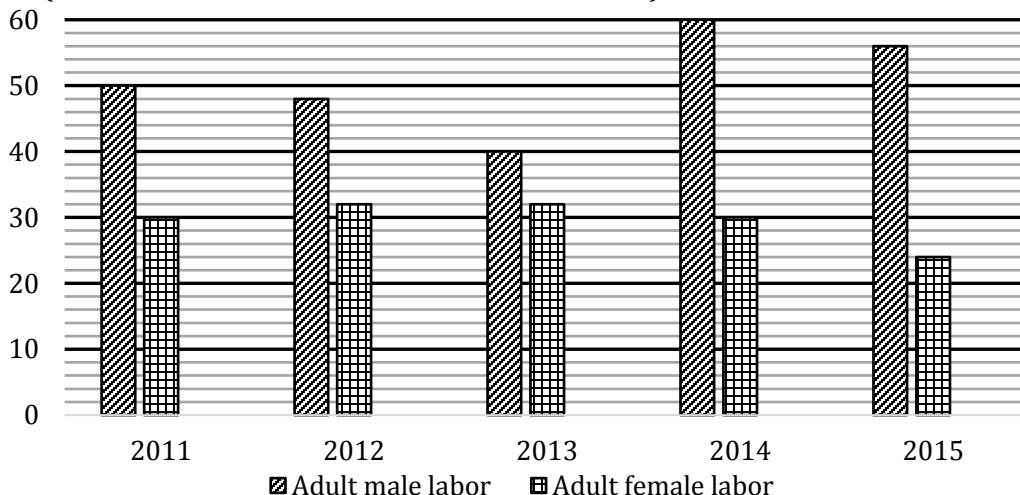
Study the given graph carefully and answer the following questions.



75. Find the ratio between the number of students of school B and no. of passed students from school D.
 (a) 2 : 1 (b) 1 : 3 (c) 3 : 1 (d) 4 : 3 (e) 2 : 3
76. Find the difference between the average no. of passed students from school A and C to that of total number of students of school B.
 (a) 1500 (b) 2000 (c) 2500 (d) 3000 (e) 1800
77. Students failed from school C is what percent of passed students from school E?
 (a) 150% (b) $66\frac{2}{3}\%$ (c) 56% (d) 125% (e) 69%
78. In which school number of passed students is maximum?
 (a) B (b) D (c) A (d) E (e) C
79. What is average no. of students passed from school A, C and E?
 (a) 5200 (b) 4800 (c) 5000 (d) 5200 (e) 4600

Direction (80 - 84): Bar graph given below shows percentage of labor (adult male labor & adult female labor) out of total labor working in a firm 'X' in five different years. Read the data carefully answer the questions.

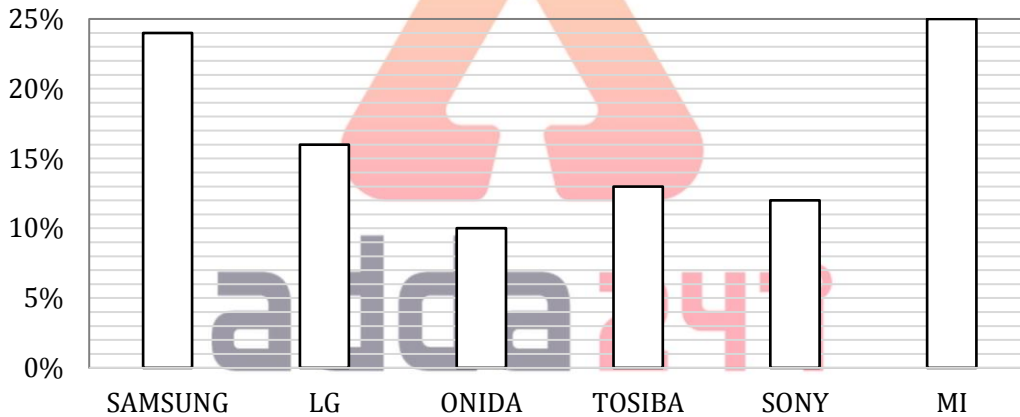
Note - Total labor = (adult male labor + adult female labor + child labor)



- 80.** If ratio of girls' child labor to boy's child labor working in the year 2013 is 3 : 4 and their difference is 48, then find the difference between adult male labor and adult female labor working in that year?
 (a) 84 (b) 96 (c) 108 (d) 88 (e) 72
- 81.** Total labor working in 2015 are 20% more than that of total labor working in 2011, then find total adult female labor working in 2015 is what percent more than total child labors working in 2011?
 (a) 42% (b) 48% (c) 40% (d) 36% (e) 44%
- 82.** If ratio of adult male labors working in 2011 to 2012 is 5 : 4 and total labors working in these two years is 2200, then find total child labors working in these two years?
 (a) 420 (b) 480 (c) 440 (d) 400 (e) 520
- 83.** A child NGO inspection team in 2014 in the city inspected firm X and imposed fine on firm of Rs. 25 for each child labor. If inspection team imposed total Rs. 2000 on the firm and total child labor working in 2015 are 220 more than that of in 2014, then find ratio of adult male labors working in 2014 and 2015 respectively?
 (a) 3 : 7 (b) 4 : 9 (c) 4 : 7 (d) 4 : 5 (e) 4 : 3
- 84.** If ratio of total labors working in 2011, 2012 and 2013 is 8 : 10 : 5 and total adult female workers working in these three years is 720, then find total number of child labors working in these three years?
 (a) 550 (b) 450 (c) 400 (d) 300 (e) 500

Directions (85-89): Given below bar chart shows percentage distribution of six different brands of TV's sold by an electronic store in the year 2017. Read the data carefully and answer the following questions:

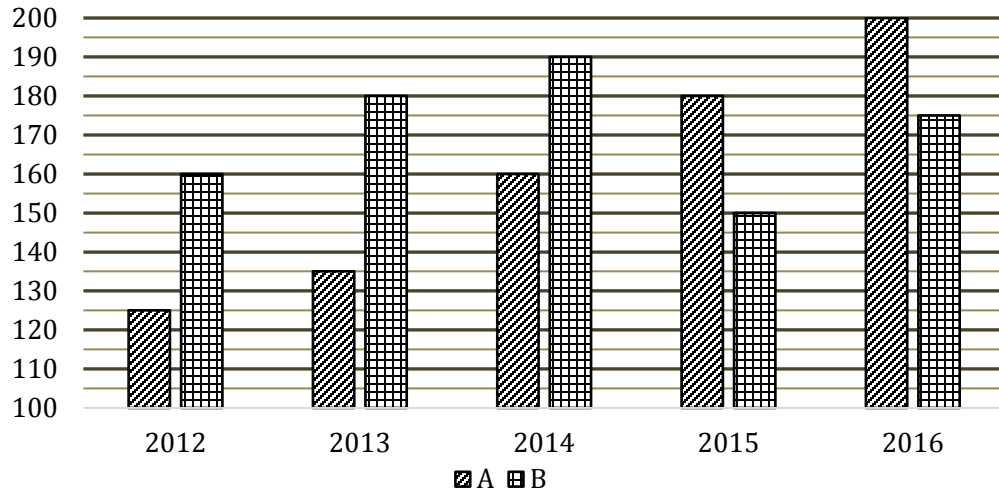
Total TV's sold = 7200



- 85.** Total TV's of SONY & ONIDA brand sold together is what percent less than total TV's of MI brand sold?
 (a) 16% (b) 18% (c) 10% (d) 12% (e) 14%
- 86.** Find the difference between average number of TV's of ONIDA & TOSIBA brand sold and average numbers of TV's of LG & SONY brand sold?
 (a) 140 (b) 120 (c) 100 (d) 160 (e) 180
- 87.** If ratio between total LED TV's and LCD TV's sold by SAMSUNG is 5 : 7 and that of by MI is 4 : 5. Then find difference between total LED TV's sold and total LCD TV's sold of both brands by store (both store sold only two types of TV's i.e. LED & LCD)?
 (a) 488 (b) 512 (c) 428 (d) 568 (e) 620
- 88.** Find the ratio between total TV's of LG & ONIDA brands sold together to total TV's of SAMSUNG & SONY brands sold together?
 (a) 18 : 13 (b) 13 : 18 (c) 13 : 21 (d) 21 : 13 (e) 13 : 17
- 89.** Total number of TV's of LG brands sold are what percent more than the total number of TV's of TOSIBA brand sold?
 (a) $25\frac{1}{13}\%$ (b) $27\frac{1}{13}\%$ (c) $23\frac{1}{13}\%$ (d) $24\frac{1}{13}\%$ (e) $26\frac{1}{13}\%$

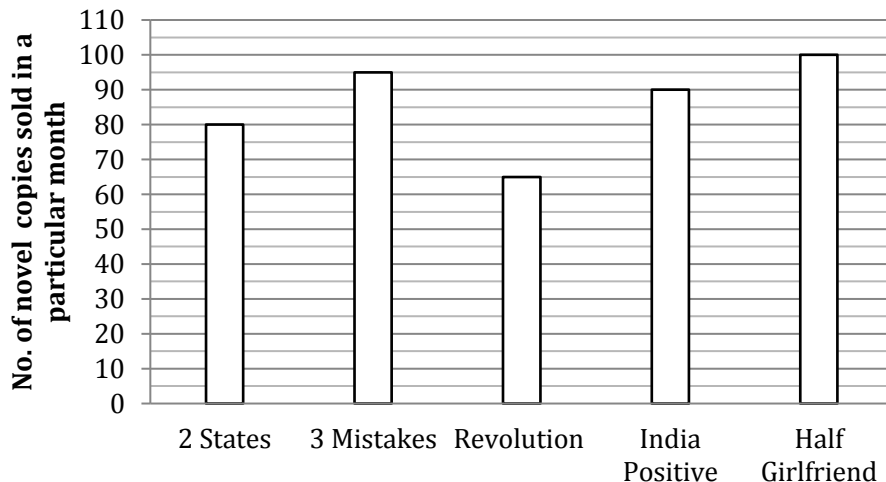
Directions (90-94): The following bar graph shows the budget allocated (in Rs crores) for sports from year 2012 to 2016 in state A and state B.

Study the given graph carefully and answer the following questions.



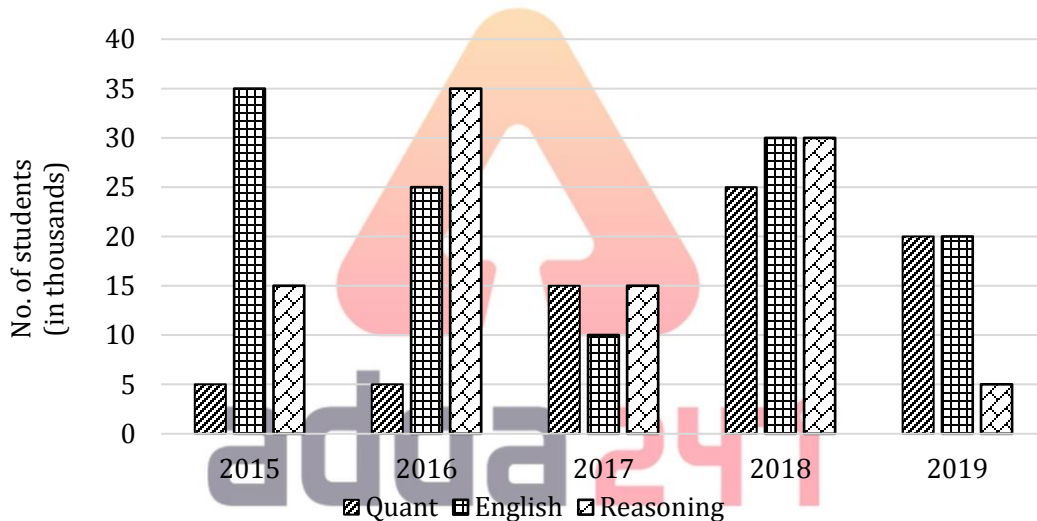
90. What is the average budget of state B during all over the years?
 (a) Rs 181 crores (b) Rs 150 crores (c) Rs 171 crores (d) Rs 179 crores (e) Rs 185 crores
91. Budget allocated for state A in year 2012 is what percentage more/less than that for state B in year 2015?
 (a) $\frac{100}{3}\%$ (b) $\frac{50}{3}\%$ (c) 16% (d) 25% (e) 50%
92. Find total budget allocated in year 2013 and 2014 together is what part of total budget allocated in year 2015 and 2016 together.
 (a) $\frac{141}{131}$ (b) $\frac{133}{143}$ (c) $\frac{141}{133}$ (d) $\frac{133}{141}$ (e) $\frac{135}{146}$
93. If in year 2017, budget allocated for state A is 20% more than previous year and for state B is 10% more than previous year. Find approximate overall gain in budget in year 2017.
 (a) 20% (b) 15% (c) 25% (d) 10% (e) 12%
94. In year 2013, state B spent 40% of the allocated sports budget on women. If the allocated budget for women was spent only on wrestling and badminton in the ratio 4 : 5, then find how much money spent on women wrestling?
 (a) Rs 32 crores (b) Rs 45 crores (c) Rs 72 crores (d) Rs 40 crores (e) Rs 38 crores

Directions (95-99): -Given bar graph shows the no. of novel copies sold in a particular month. Study the graph carefully and answer questions.



95. No. of Copies sold of half girlfriend & 3 mistakes together are what percent more/less than no. of copies sold of revolution & 2 states? (approx.)
 (a) 25% (b) 35% (c) 30% (d) 40% (e) 32%
96. What is the difference between average no. of copies sold of 2 states, 3 mistakes & revolution together and average no. of copies sold of India positive & half girlfriend together?
 (a) 20 (b) 18 (c) 15 (d) 16 (e) 12
97. No. of Copies sold of revolution are what percent of that of 2 states?
 (a) 83% (b) 84.75% (c) 76.5% (d) 123% (e) 81.25%
98. How many average no. of copies are sold in the given month?
 (a) 86 (b) 85 (c) 87 (d) 88 (e) 84
99. How many novel's copies sold in the month are more than the average no. of copies sold of all novels in the given month?
 (a) 1 (b) 2 (c) 4 (d) 3 (e) None

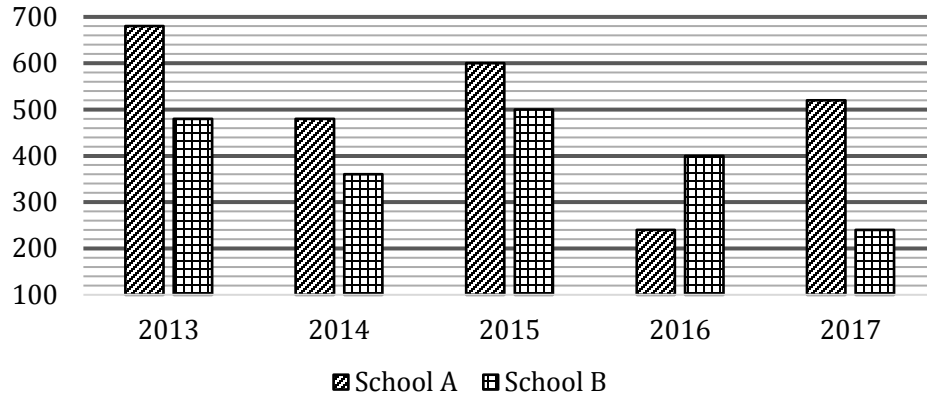
Directions (100-104): Given bar graph shows no. of students (in thousands) who opted for three different specialization during the given five years in a university.



100. Out of total number of students who opted for the given three subjects, in year 2019, 38% were girls. How many boys opted for reasoning in the same year?
 (a) 1124 (b) 1536 (c) 1316
 (d) Cannot be determined (e) None of these
101. If the total number of students in the university in the year 2017 was 4,00,000, then the total number of students who opted for the given three subjects were what percent of the total students?
 (a) 17% (b) 10% (c) 14% (d) 7% (e) 21%
102. What is the total number of students who opted for Quant and reasoning together in the years 2016, 2017 and 2019 together?
 (a) 97000 (b) 93000 (c) 85000 (d) 96000 (e) 95000
103. The total number of students who opted for Reasoning in the years 2015 and 2018 together are approximately what percent of the total number of students who opted for all three subjects in same years? (approx.)
 (a) 36% (b) 24% (c) 44% (d) 32% (e) 46%
104. What is the respective ratio between the number of students who opted for English in the years 2016 and 2018 together to the number of students who opted for Quant in the years 2015 and 2019 together?
 (a) 11 : 5 (b) 11 : 9 (c) 11 : 7 (d) 14 : 3 (e) 13 : 7

Direction(105-110): Study the bar-graph given below carefully and answer the questions.

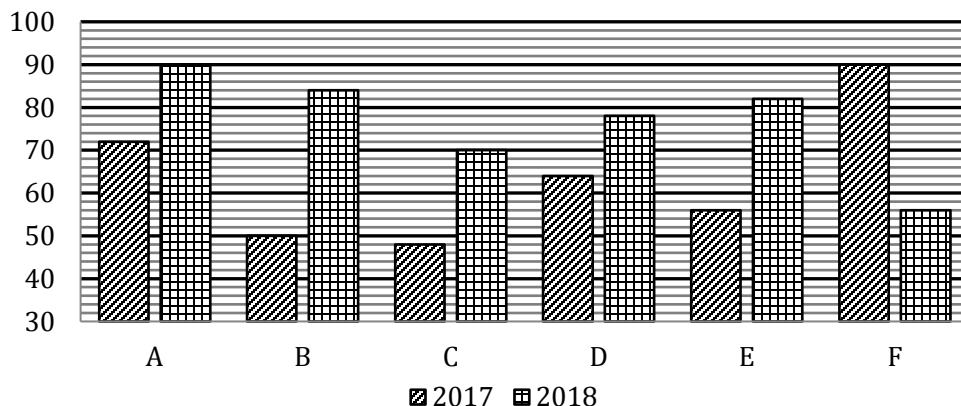
Bar-graph given below shows the number of students(boys+girls) in five different years in two different schools.



- 105.** In 2014, in school A if number of girls are 120 more than number of boys in same school. Then find number of boys in school A in 2014 is what percent of number of students in school B (boys + girls) in year 2016?
 (a) 45% (b) 50% (c) 55% (d) 40% (e) 60%
- 106.** In 2018 if number of boys in school A is 60% of the total students in 2013 in both the schools and number of girls in school A is 40% of number of students in school B in 2015. Then find total students (boys+ girls) in school A in 2018?
 (a) 625 (b) 824 (c) 896 (d) None of these (e) 756
- 107.** In 2015, in school A ratio of number of boys to number of girls is 3 : 5 and in year 2016 in school B number of girls are 40 % less than number of boys in same school in same year. Then find ratio of boys in school A in 2015 to girls in school B in 2016?
 (a) 2 : 1 (b) 3 : 1 (c) 4 : 3 (d) 3 : 2 (e) None of these
- 108.** Find the average number of students (boys+ girls) in school B in all the years together?
 (a) 286 (b) 324 (c) 336 (d) None of these (e) 396
- 109.** Total students (boys + girls) in both the schools in year 2013 is approximately what percent of the total students (boys + girls) in both schools in year 2017?
 (a) 153% (b) 168% (c) 173% (d) 192% (e) 141%
- 110.** In 2014, in school B difference between boys and girls is 160 and ratio of no. of boys to no. of girls in school A in year 2017 is 5 : 8. Then find the difference in no. of boys in school B in 2014 and in school A in 2017?(no. of boys is less than no. of girls in 2014 in school B)
 (a) 140 (b) 100 (c) 150 (d) 200 (e) 225

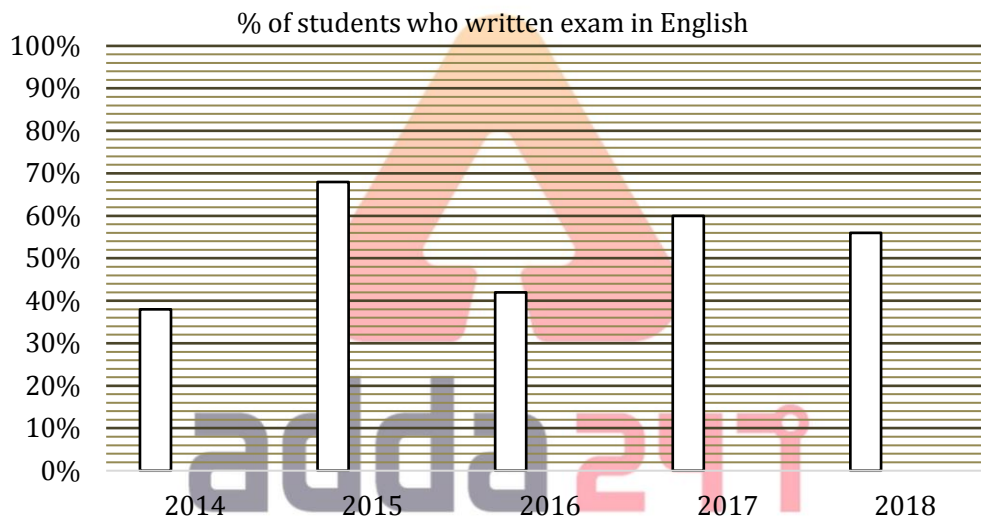
Directions (111-115): Study the bar chart given below and answer the following questions.

Bar chart shows the number of books (in '000) sold by 6 different companies (A, B, C, D, E & F) in two different years (2017 & 2018).



- 111.** Books sold by D & E together in 2018 are what percent more or less than books sold by B & F together in 2017?
 (a) $12\frac{1}{3}\%$ (b) $15\frac{2}{3}\%$ (c) $11\frac{4}{5}\%$ (d) $14\frac{2}{7}\%$ (e) None of the above.
- 112.** Find the ratio of books sold by A & C together in 2017 to books sold by E & F together in 2018.
 (a) 20 : 23 (b) 15 : 16 (c) 3 : 8 (d) 10 : 17 (e) 4 : 5
- 113.** Average number of books sold by A, B & D in 2017 are how much more or less than average number of books sold by C & E in 2018?
 (a) 19000 (b) 14000 (c) 12000 (d) 20000 (e) 16000
- 114.** Books sold by A, C & F together in 2017 are what percent of books sold by A, D & E together in 2018?
 (a) 96% (b) 88% (c) 80% (d) 95% (e) 84%
- 115.** Total books sold by all 6 companies in 2018 are what percent more or less than total books sold by all 6 companies in 2017?
 (a) 40% (b) 20% (c) 50% (d) 10% (e) 30%

Directions (116-120): Bar graph given below shows percentage of students out of total selected students who written UPSC exam in English language in five different years. Read the data carefully and answer the questions.

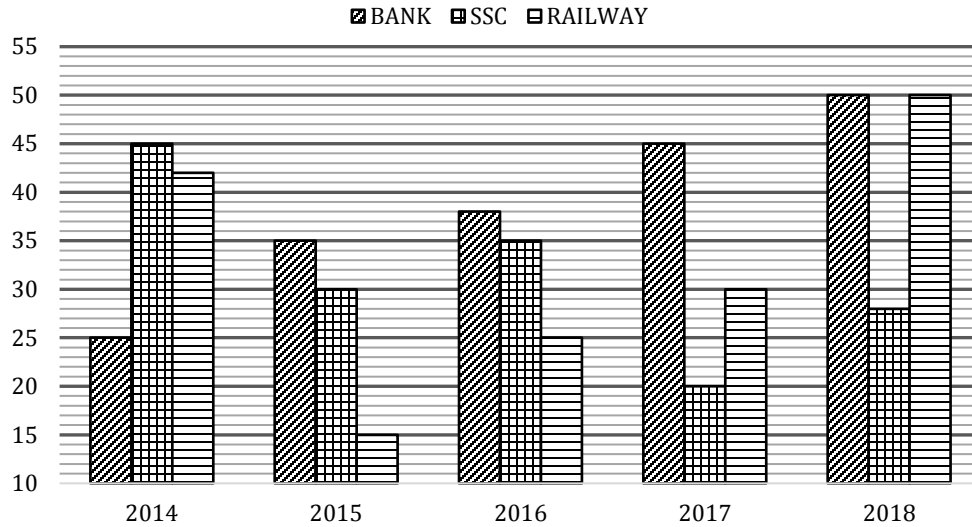


Note: - Exam can be written only in two languages either English or Hindi.

- 116.** If no. of students who written exam in Hind in year 2017 are 450 less than no. of students who written exam in English in the same year and total no. of selection in 2017 are 10% less than total no. of selection in 2015, then find total selection in 2015?
 (a) 2250 (b) 2325 (c) 2400 (d) 2500 (e) 2025
- 117.** Ratio of total selection in year 2014 to that of 2016 is 2:3. Find ratio of students who written exam in Hindi and got selected in 2014 to that of in 2016?
 (a) 62:87 (b) 31:43 (c) 11:19 (d) 7:11 (e) 62:89
- 118.** If total no. of selection in each the given year are same and average no. of students who written exam in English and got selected in 2014, 2015 and 2018 are 540. Find no. of selection in each year?
 (a) 1200 (b) 1000 (c) 1500 (d) 800 (e) 900
- 119.** If no. students who written exam in Hindi and got selected in 2015 and 2018 are equal, find ratio of total selection in 2015 to 2018?
 (a) 5:4 (b) 7:8 (c) 17:14 (d) 11:8 (e) 17:8
- 120.** If in 2014 and 2017 no. of students who written exam in English and got selected are 380 and 480 respectively, find total no. of selection in 2017 are how much percent more/less than that of 2014?
 (a) 20% less (b) 25% more (c) 20% more (d) 25% less (e) 15% more

Direction (121 – 125): Bar graph given below shows number of students (in'000) who joined Adda247 for Bank, SSC, Railway in five different years

Study the following graph carefully and answer the questions that follows



- 121.** Maximum no. of students is how much percent more than minimum no. of students in any year who joined for banking, ssc and railways?
 (a) 266.67% (b) 233.33% (c) 266.33% (d) 267.66% (e) 233.67%
- 122.** What is the ratio of average no. of students who joined for railway in 2014, 2016 and 2017 to average no. of students who joined for banking in year 2015 & 2018?
 (a) 194:255 (b) 97:117 (c) 117:97 (d) 177:194 (e) None of these.
- 123.** If ratio of boys to girls in banking in year 2016 is 11:8 and no. of boys are 25% less than that of girls in ssc in same year, then find the difference between no. of boys in banking and no. of girls in ssc in 2016?
 (a) 3000 (b) 4000 (c) 7000 (d) 2500 (e) 2000
- 124.** In 2014 no. of students qualified in exam are 50%, 25% and 20% in banking, ssc and railways respectively out of total students who joined Adda247 for banking, ssc & railways in 2014 respectively. Find average no. of students qualified in banking and ssc in 2014 are how much more than who qualified in railway in 2014?
 (a) 3425 (b) 3405 (c) 3475 (d) 3450 (e) 3440
- 125.** No. of student who joined for ssc in 2018 are what percent of number of students who joined for railway in 2014?
 (a) $66\frac{2}{3}\%$ (b) $33\frac{2}{3}\%$ (c) $33\frac{1}{3}\%$ (d) $66\frac{1}{3}\%$ (e) None of these.

Practice MCQs for Prelims (Solutions)

1. (a): required ratio = $\frac{2000}{(4000-2500)} = \frac{2000}{1500} = \frac{4}{3}$

2. (d): required % = $\frac{(2500-2000)+(4000-2500)}{3000} \times 100 = \frac{2000}{3000} \times 100 = 66.67\%$

3. (b): required average = $\frac{2000+2000+2500+2500}{4} = \frac{9000}{4} = 2250$

4. (c): Total girls in school A and B = $(3000 - 2000) + (2500 - 2000) = 1000 + 500 = 1500$
 Total girls in school B and D = $(2500 - 2000) + (3500 - 1500) = 500 + 2000 = 2500$

So, required percentage = $\frac{2500-1500}{2500} \times 100 = \frac{1000}{2500} \times 100 = 40\%$

5. (e): Total no. of girls in school A, C and D
 = $(3000 - 2000) + (4000 - 2500) + (3500 - 1500)$
 = $1000 + 1500 + 2000 = 4500$
 Required difference
 = $(2000 + 2500) - (4500) = 0$

6. (c): Phones sold by Nokia in 2018
 = $10000 \times \frac{112}{100} = 11200$
 Phones sold by Samsung in 2018
 = $30000 \times \frac{115}{100} = 34500$

Required number of phones = $11200 + 34500$
 $= 45700$

7. (e): Required percentage = $\frac{25000-20000}{20000} \times 100 = 25\%$

8. (a): No. of HTC mobile sold in 2018
 $= 12000 \times \frac{120}{100} = 14400$
 Required difference
 $= 20000 - 14400 = 5600$ less

9. (c): Required ratio = $\left(30000 \times \frac{115}{100}\right) : \left(25000 \times \frac{70}{100}\right)$
 $= 34500:17500$
 $= 69:35$

10. (a): Required average = $\frac{1}{2} \times \left(25000 \times \frac{105}{100} + 12000 \times \frac{120}{100}\right)$
 $= \frac{1}{2} \times (26250 + 14400)$
 $= 20325$

11. (d): Increase in sales of HTC and Sony mobile together
 $= 12000 \times \frac{20}{100} + 20000 \times \frac{10}{100} = 4400$
 Required percentage = $\frac{4400}{10000} \times 100 = 44\%$

12. (d): Required difference = $12000 - 7500 = 4500$

13. (e): Required % = $\frac{(9000+6000)-12000}{12000} \times 100$
 $= \frac{3000}{12000} \times 100$
 $= 25\%$

14. (c): Required average
 $= \frac{(9000-7500)+(6000-4000)+(12000-8000)}{3}$
 $= \frac{1500+2000+4000}{3} = \frac{7500}{3} = 2500$

15. (a): Required percentage
 $= \frac{7500}{(6000-4000)+(12000-8000)} \times 100$
 $= \frac{7500}{7500} \times 100 = 125\%$

16. (b): Required ratio = $9500 \times 4 : 8000 \times 5 = 19:20$

17. (b): Required percentage
 $= \frac{6500-4500}{6500} \times 100 = 30.77\%$

18. (b): Required ratio = $(4500 - 3500) : 3000$
 $= 1000:3000 = 1:3$

19. (e): Required percentage = $\frac{4500-3500}{3500+4500} \times 100$
 $= \frac{500}{8000} \times 100 = 6.25\%$

20. (b): Required average
 $= \frac{1}{2} [(4000 + 4500) + (4500 + 5500)] = 9250$

21. (e): decrease percentage of import in year 2014 to 2015 = $\frac{4000-3000}{4000} \times 100 = 25\%$

Decrease percentage of export in year 2015 to 2016 = $\frac{6000-4500}{6000} \times 100 = 25\%$

Required difference = $25\% - 25\% = 0\%$

22. (d): Required percentage = $\frac{300}{540} \times 100 = 55.55\%$

23. (c): Required average = $\frac{280+450+300+360+540}{5} = \frac{1930}{5}$
 $= 386$ ton

24. (b): Required percentage = $\frac{540-450}{450} \times 100$
 $= \frac{90}{450} \times 100 = 20\%$

25. (a): Required ratio = $\frac{280+300}{360+540} = \frac{580}{900}$
 $= 29 : 45$

26. (b): Required percentage = $\frac{360-300}{360} \times 100$
 $= \frac{60}{360} \times 100 = 16.67\%$

27. (c): Required difference = $(450+300+540)-(280+360)$
 $= 1290 - 640 = 650$ ton

28. (b): Total lectures taken by male lecturers in Friday = $450 - 250 = 200$

Total lectures taken by male lecturers in Tuesday
 $= 350 - 200 = 150$

Required percentage = $\frac{200-150}{150} \times 100$
 $= \frac{50}{150} \times 100 = 33\frac{1}{3}\%$

29. (d): Total lectures taken by female lecturers in Wednesday = 100

Total lectures taken by male lecturers in Monday
 $= 400 - 150 = 250$

Required ratio = $100 : 250 = 2 : 5$

30. (e): Total lectures taken by male lecturers having age below 50 years in Thursday

$= (250 - 50) \times \frac{60}{100} = 120$

Required difference = $120 - 50 = 70$

31. (a): Total lectures taken by male lecturers in Monday
 $= 400 - 150 = 250$

Total lectures taken by male lecturers in Tuesday
 $= 350 - 200 = 150$

Total lectures taken by male lecturers in Friday
 $= 450 - 250 = 200$

Required average = $\frac{250+150+200}{3} = 200$

32. (b): required average = $\frac{2400+3600+3000}{3} = 3000$.

33. (e): required total = $2000 \times 0.55 + 3500 \times 0.4 = 2500$

34. (a): required difference = $\{(3600 \times 0.5 + 2000 \times 0.45 + 3500 \times 0.6) - (3600 \times 0.5 + 2000 \times 0.55 + 3500 \times 0.4)\} = 500$

35. (c): required average

$$= \frac{(2400 \times 0.4 + 3600 \times 0.5 + 2000 \times 0.45 + 3000 \times 0.48 + 3500 \times 0.6)}{5}$$

$$= 1440.$$

36. (c): Total number of sedans in A & E together

$$= 4800 + 3600 = 8400$$
 Total number of SUVs in B & E together

$$= 4000 + 4000 = 8000$$
 Required % = $\frac{8400 - 8000}{8000} \times 100 = 5\%$

37. (a): Total sedans in C & D together = 5000 + 3000

$$= 8000$$
 Total SUVs in A & D together = 3200 + 5400

$$= 8600$$
 Required ratio = $\frac{8000}{8600} = 40:43$

38. (b): Total number of SUVs in C & D together = 4800 + 5400

$$= 10200$$
 Total number of sedans in B & E together

$$= 5400 + 3600 = 9000$$
 Required difference = $10200 - 9000 = 1200$

39. (a): Total number of hatchbacks in D = $\frac{80}{100} \times 5000$

$$= 4000$$
 Required difference = $4800 - 4000 = 800$

40. (c): total Samsung mobiles = 2400 + 4400 + 1800 + 2800 = 11400

41. (e): required answer = $(2300 + 2500) - (1800 + 2800) = 200$

42. (d): required % = $\frac{1800}{2700} \times 100 = 66\frac{2}{3}\%$

43. (a): required ratio = $(2300 + 2500 + 3500) : (2400 + 4400 + 2800)$

$$= 83:96$$

44. (e): Nokia (2017) = $\frac{2500 - 2300}{2300} \times 100 = 8.7\%$
 Nokia (2018) = $\frac{3500 - 2500}{2500} \times 100 = 40\%$
 Samsung (2019) = $\frac{2800 - 1800}{1800} \times 100 = 55.55\%$
 Nokia (2019) = $\frac{2700 - 3500}{3500} \times 100 = 23\%$ (decrease)
 Samsung (2017) = $\frac{4400 - 2400}{2400} \times 100 = 83.33\%$
 Clearly, Samsung in 2017 shows maximum production increase

45. (d): let his total expenditure be Rs. x in July
 Savings = $\frac{40}{100} \times x \times \frac{1}{2} = \text{Rs. } \frac{x}{5}$
 ATQ, $x + \frac{x}{5} = 12000$

$x = \text{Rs. } 10000$

Expenditure on food = $\frac{30}{100}x = \frac{30}{100} \times 10000 = \text{Rs. } 3000$

46. (a): let salary & savings be Rs. x & Rs. y respectively for March & June
 Expenditure in March = expenditure in June = Rs. (x - y)
 Expenditure on travel in March = Rs. $\frac{35}{100} \times (x - y)$
 Expenditure on food in June = Rs. $\frac{40}{100} \times (x - y)$
 Required % = $\frac{35}{40} \times 100 = 87.5\%$

47. (e): let total expenditure in May & July is Rs. 5x & Rs. 4x respectively.
 Required ratio = $\left(\frac{35}{100}\right) \times 5x : \left(\frac{30}{100}\right) \times 4x = 35 : 24$

48. (c): expenditure in March = $\frac{90}{100} \times 5000 = \text{Rs. } 4500$
 Expenditure on rent in March = $\frac{40}{100} \times 4500 = \text{Rs. } 1800$
 Expenditure in July = $\frac{90}{100} \times 8000 = \text{Rs. } 7200$
 Expenditure on rent in July = $\frac{40}{100} \times 7200 = \text{Rs. } 2880$
 Required average = $\frac{1800 + 2880}{2} = \text{Rs. } 2340$

49. (c): let equal expenditure be Rs. x.
 Required % = $\frac{\frac{35}{100}x - \frac{30}{100}x}{\frac{30}{100}x} \times 100 = \frac{5}{30} \times 100 = 16.67\%$

50. (e): females in company A = $\frac{50}{100} \times 500 = 250$
 Required % = $\frac{250}{750} \times 100 = 33\frac{1}{3}\%$

51. (c): required average = $\frac{600 + 450 + 800}{3} = \frac{1850}{3} = 616.67$

52. (b): required difference = $\frac{500 + 750}{2} - \frac{600 + 450}{2} = 100$

53. (d): total female employees in D and E together = $\frac{7}{15} \times 450 + \frac{3}{10} \times 800 = 210 + 240 = 450$

54. (a): Total employees in company F = $\frac{60}{100} \times 600 + \frac{70}{100} \times 450 = 360 + 315 = 675$

55. (a): Average number of students in Science, Commerce and Arts stream in school

$$T = \frac{680 + 470 + 380}{3} = 510$$
 Average numbers of students in Science, Commerce and Arts stream in school R

$$= \frac{340 + 410 + 570}{3} = 440$$
 Required difference = $510 - 440 = 70$

56. (d): Total number of student of science stream from school P, Q and R together = $450 + 570 + 340 = 1360$

Total number of students of Arts stream from schools R, S and T together
 $= 570 + 490 + 380$
 $= 1440$
 Required difference $= 1440 - 1360 = 80$

57. (c): Total students of arts stream from school Q and T together $= 340 + 380 = 720$
 Total students of science stream from school R and S together $= 340 + 560 = 900$
 Required percentage $= \frac{720}{900} \times 100$
 $= 80\%$

58. (a): Total science stream students from school S and T together $= 560 + 680 = 1240$
 Total commerce students from school Q and T together $= 450 + 470 = 920$
 Required ratio $= \frac{1240}{920}$
 $= 31 : 23$

59. (c): Average number of commerce students in all the schools $= \frac{580 + 450 + 410 + 500 + 470}{5}$
 $= \frac{2410}{5} = 482$

60. (d): Let votes received by BJP, INC & SP be $11x$, $3x$ & $5x$ respectively.
 ATQ,
 $11x - 5x = 24000$
 $x = 4000$
 Required sum $= 3x + 5x$
 $= 8 \times 4000$
 $= 32000$

61. (a): Total valid votes in D $= 60000 \times \frac{75}{100}$
 $= 45000$
 Valid votes received by BJP in D
 $= 45000 \times \frac{70}{100} = 31500$
 Valid votes received by INC $= 45000 - 31500$
 $= 13500$
 Required difference $= 31500 - 13500 = 18000$

62. (d): Let valid votes received by AAP in E be x
 So, valid votes received by INC in E $= x + 15000$
 Then,
 Votes received by BJP in E $= (x + 15000) + 15000$
 $= x + 30000$
 ATQ,
 $x + x + 15000 + x + 30000 = 75000 \times \frac{80}{100}$
 $3x + 45000 = 60000$
 $3x = 15000$
 $x = 5000$
 So, required number of valid votes $= x + 30000$
 $= 35000$

63. (a): Votes received by INC in B $= 90000 \times \frac{40}{100} = 36000$

Invalid votes received by INC in B $= 90000 \times \frac{40}{100} \times \frac{1}{3} = 12000$
 So, total valid votes received by INC in B
 $= 36000 - 12000 = 24000$

64. (c): Valid votes received by INC in C
 $= 40000 \times \frac{90}{100} \times \frac{2}{12} = 6000$
 Valid votes received by SP in C
 $= 40000 \times \frac{90}{100} \times \frac{3}{12} = 9000$
 Invalid votes received by INC in C
 $= 40000 \times \frac{10}{100} \times \frac{3}{10} = 1200$
 Invalid votes received by SP in C
 $= 40000 \times \frac{10}{100} \times \frac{4}{10} = 1600$
 Required difference $= (9000 + 1600) - (6000 + 1200)$
 $= 10600 - 7200$
 $= 3400$

65. (b): Total number of students who have opted for MBBS in all the colleges together
 $= 700 \times \frac{40}{100} + 800 \times \frac{25}{100} + 400 \times \frac{32}{100} + 900 \times \frac{36}{100}$
 $= 932$
 Required average $= \frac{932}{4} = 233$

66. (d): Total no. of students who have opted for both Engg. and MBBS together in college Q
 $= 800 \times \frac{40}{100} + 800 \times \frac{25}{100}$
 $= 520$
 Total no. of students who have opted for both Engg. and MBBS together in college R
 $= 400 \times \frac{44}{100} + 400 \times \frac{32}{100}$
 $= 304$
 Required ratio $= \frac{520}{304}$
 $= 65 : 38$

67. (a): Total number of students who have opted for MBBS in college P $= 700 \times \frac{40}{100} = 280$
 Total number of students who have opted for the engg. in college Q $= 800 \times \frac{40}{100} = 320$
 Required percentage $= \frac{280}{320} \times 100 = 87.5\%$

68. (c): Total number of students who have opted for engg. stream in college R $= 400 \times \frac{44}{100} = 176$
 Total number of students who have opted for engg. stream in college P $= 700 \times \frac{32}{100} = 224$
 Required ratio $= \frac{176}{224}$
 $= 11 : 14$

- 69. (b):** Total student in pharmacy in college P = $700 \times \frac{28}{100} = 196$
 Total student in pharmacy in college Q = $800 \times \frac{35}{100} = 280$
 Total student in pharmacy in college R = $400 \times \frac{24}{100} = 96$
 Total student in pharmacy in college S = $900 \times \frac{22}{100} = 198$
 So, maximum no. of student is in college Q in pharmacy
 Total student in engg. in college P = $700 \times \frac{32}{100} = 224$
 Total student in engg. in college Q = $800 \times \frac{40}{100} = 320$
 Total student in engg. in college R = $400 \times \frac{44}{100} = 176$
 Total student in engg. in college S = $900 \times \frac{42}{100} = 378$
 So, Maximum no. of student is in college S in engg.
 Therefore, required pair is Q & S
- 70. (d):** Average number of students of school A across all the years = $\frac{280+340+370+240+210}{5} = 288$
 Average number of students of school B across all the years = $\frac{350+310+260+340+250}{5} = 302$
 Required difference = $302 - 288 = 14$
- 71. (a):** Total number of students of school A in 2011 and 2012 together = $280 + 340 = 620$
 Total number of students of school C in 2013 and 2014 together = $280 + 380 = 660$
 Required ratio = $\frac{620}{660} = 31 : 33$
- 72. (d):** total number of students in 2016 in all the schools together = $210 \times \frac{110}{100} + 250 \times \frac{120}{100} + 260 \times \frac{115}{100} = 231 + 300 + 299 = 830$
- 73. (a):** Total students of all the three schools together in 2013 = $370 + 260 + 280 = 910$
 Total students of school B in 2011 and 2015 together = $350 + 250 = 600$
 Required percentage = $\frac{910 - 600}{600} \times 100 = 51.66\%$
 = 52% (approx.)

- 74. (d):** Total number of students from all the schools in 2011 and 2013 together = $(280 + 350 + 220) + (370 + 260 + 280) = 1760$
 Total number of students from all the schools in 2014 and 2015 together = $(240 + 340 + 380) + (210 + 250 + 260) = 1680$
 Required difference = $1760 - 1680 = 80$
- 75. (c):** required ratio = $\frac{7500}{5000 \times \frac{50}{100}} = \frac{7500}{2500} = 3 : 1$
- 76. (d):** average of passed students from school A and C = $\frac{6000 \times \frac{70}{100} + 8000 \times \frac{60}{100}}{2} = \frac{4200 + 4800}{2} = 4500$
 So, required difference = $7500 - 4500 = 3000$
- 77. (b):** required percentage = $\frac{8000 \times \frac{40}{100}}{6000 \times \frac{80}{100}} \times 100 = \frac{3200}{4800} \times 100 = \frac{200}{3}\% = 66\frac{2}{3}\%$
- 78. (a):** From graph it is clearly visible that the maximum no. of students passed in school B
 i.e., $7500 \times \frac{90}{100} = 6750$
- 79. (e):** required average = $\frac{6000 \times \frac{70}{100} + 8000 \times \frac{60}{100} + 6000 \times \frac{80}{100}}{3} = \frac{4200 + 4800 + 4800}{3} = \frac{13800}{3} = 4600$
- 80. (b):** Let total labor working in 2013 = $100x$
 Total child labor working in 2013 = $28x$
 ATQ –
 $28x \times \left(\frac{4}{7} - \frac{3}{7}\right) = 48$
 $4x = 48$
 $x = 12$
 Required difference = $1200 \times \left(\frac{40}{100} - \frac{32}{100}\right) = 96$
- 81. (e):** Let total labors working in 2011 = $500y$
 So, total labors working in 2015 = $600y$
 Total female labor working in 2015 = $600y \times \frac{24}{100} = 144y$
 Total child labors working in 2011 = $500y \times \frac{20}{100} = 100y$
 Required percentage = $\frac{144y - 100y}{100y} \times 100 = 44\%$
- 82. (c):** Let total labors working in 2011 = x
 And, total labors working in 2012 = y
 Total male labors working in 2011 = $0.5x$
 And, total male labors working in 2012 = $0.48y$

$$\begin{aligned} \text{ATQ -} \\ \frac{0.5x}{0.48y} &= \frac{5}{4} \\ x : y &= 6 : 5 \\ \text{So, } y &= \frac{5x}{6} \end{aligned}$$

$$\begin{aligned} \text{ATQ -} \\ x + \frac{5x}{6} &= 2200 \end{aligned}$$

$$x = 1200$$

$$y = 1000$$

$$\begin{aligned} \text{Total child labors working in 2011 \& 2012} \\ \text{together} &= 1200 \times \frac{20}{100} + 1000 \times \frac{20}{100} = 440 \end{aligned}$$

$$83. (c): \text{Total child labor working in 2014} = \frac{2000}{25} = 80$$

$$\text{Total male labors working in 2014}$$

$$= 80 \times \frac{60}{10} = 480$$

$$\text{Total child labor working in 2015}$$

$$= 80 + 220 = 300$$

$$\text{Total male labors working in 2015}$$

$$= 300 \times \frac{56}{20} = 840$$

$$\text{Required ratio} = \frac{480}{840} = 4 : 7$$

$$84. (e): \text{Let total labors working in 2011, 2012 and 2013 be } 80a, 100a \& 50a \text{ respectively}$$

$$\begin{aligned} \text{Total female labors working in 2011} &= 80a \\ \times \frac{30}{100} &= 24a \end{aligned}$$

$$\begin{aligned} \text{Total female labors working in 2012} &= 100a \times \frac{32}{100} \\ &= 32a \end{aligned}$$

$$\begin{aligned} \text{Total female labors working in 2013} &= 50a \\ \times \frac{32}{100} &= 16a \end{aligned}$$

$$\begin{aligned} \text{ATQ -} \\ 24a + 32a + 16a &= 720 \end{aligned}$$

$$72a = 720$$

$$a = 10$$

$$\begin{aligned} \text{Total number of child labors working in 2011,} \\ \text{2012 and 2013} \end{aligned}$$

$$= 800 \times \frac{20}{100} + 1000 \times \frac{20}{100} + 500 \times \frac{28}{100}$$

$$= 160 + 200 + 140$$

$$= 500$$

$$85. (d): \text{Total sold TV's of MI brand}$$

$$= 7200 \times \frac{25}{100}$$

$$= 1800$$

$$\text{Total sold TV's of Sony \& Onida together}$$

$$= 7200 \times \frac{(12+10)}{100}$$

$$= 7200 \times \frac{22}{100}$$

$$= 1584$$

$$\text{Required percentage} = \frac{1800-1584}{1800} \times 100$$

$$= \frac{216 \times 100}{1800} = 12\%$$

Alternative solution

$$\text{Required percent} = \frac{25 - (12+10)}{25} \times 100 = 12\%$$

$$86. (e): \text{Average numbers of sold TV's of ONIDA \& Toshiba brand}$$

$$= \frac{7200 \times \frac{(10+13)}{100}}{2}$$

$$= \frac{1656}{2}$$

$$= 828$$

$$\text{Average number of sold TV's of LG \& Sony brand}$$

$$= \frac{7200 \times \frac{(16+12)}{100}}{2}$$

$$= \frac{2016}{2}$$

$$= 1008$$

$$\text{Required difference} = 1008 - 828 = 180$$

$$87. (a): \text{Total LED TV's sold by Samsung \& MI together}$$

$$= 7200 \times \frac{24}{100} \times \frac{5}{12} + 7200 \times \frac{25}{100} \times \frac{4}{9}$$

$$= 720 + 800$$

$$= 1520$$

$$\text{Total LCD TV's sold by Samsung \& MI together}$$

$$= 7200 \times \frac{24}{100} \times \frac{7}{12} + 7200 \times \frac{25}{100} \times \frac{5}{9}$$

$$= 1008 + 1000$$

$$= 2008$$

$$\text{Required difference} = 2008 - 1520 = 488$$

$$88. (b): \text{Required ratio} = \frac{7200 \times \frac{(16+10)}{100}}{7200 \times \frac{(24+12)}{100}}$$

$$= 13 : 18$$

Or, Alternative —

$$\text{Required ratio} = \frac{(16+10)\%}{(24+12)\%}$$

$$= 13 : 18$$

$$89. (c): \text{Required percentage} = \frac{7200 \times \frac{16}{100} - 7200 \times \frac{13}{100}}{7200 \times \frac{13}{100}} \times 100$$

$$= \frac{1152 - 936}{936} \times 100$$

$$= \frac{216}{936} \times 100$$

$$= 23 \frac{1}{13} \%$$

$$90. (c): \text{required average}$$

$$= \frac{(160+180+190+150+175)}{5} = \text{Rs } 171 \text{ crores}$$

$$91. (b): \text{required percentage} = \frac{(150-125) \times 10^7}{150 \times 10^7} \times 100$$

$$= \frac{50}{3} \%$$

$$92. (d): \text{required ratio} = \frac{(135+180+160+190) \times 10^7}{(180+150+200+175) \times 10^7} = \frac{133}{141}$$

$$93. (b): \text{required percentage}$$

$$= \frac{(200 \times \frac{120}{100} + 175 \times \frac{110}{100}) \times 10^7 - (200+175) \times 10^7}{(200+175) \times 10^7} \times 100$$

$$= \frac{432.5 - 375}{375} \times 100$$

$$= \frac{46}{3} \% \approx 15\%$$

- 94. (a):** Required amount = $\frac{40}{100} \times 180 \times 10^7 \times \frac{4}{9}$
= 32 crores
- 95. (b):** No. of copies sold of half girlfriend & 3 mistakes =
100 + 95 = 195
No. of Copies sold of revolution & 2 states = 65 +
80 = 145
Required % = $\frac{195-145}{145} \times 100 = 34.48\% \approx 35\%$
- 96. (c):** required difference = $\frac{90+100}{2} - \frac{80+95+65}{3} = 15$
- 97. (e):** required % = $\frac{65}{80} \times 100 = 81.25\%$
- 98. (a):** required average = $\frac{80+95+65+90+100}{5} = \frac{430}{5} = 86$
- 99. (d):** Average no. of copies sold = 86 (from previous solution)
Required answer = 3 mistakes, India Positive, Half Girlfriend
So, no. of copies sold of 3 novels are more than average no. of copies sold of all novels.
- 100. (d):** We do not know the number of girls in reasoning.
So, we can't determine the no. of boys in reasoning for that years.
- 101. (b):** Required percentage
 $\Rightarrow \frac{40,000}{400,000} \times 100 = 10\%$
- 102. (e):** Required number of students
 $\Rightarrow (5 + 35 + 15 + 15 + 20 + 5) \times 1000 = 95000$
- 103. (d):** Required percentage
 $\Rightarrow \left(\frac{15+30}{55+85} \right) \times 100$
 $\Rightarrow \frac{45}{140} \times 100 \approx 32\%$
- 104. (a):** Required ratio
 $\Rightarrow (25 + 30) : (5 + 20)$
 $\Rightarrow 55 : 25 = 11 : 5$
- 105. (a):** In department B of company X total employee = 480
Let than number of males in department B of company X be x
So, number of females in department B of company X = 120 + x
ATQ,
 $x + x + 120 = 480$
 $2x = 360$
 $x = 180$
Required percentage = $\frac{180}{400} \times 100 = 45\%$
- 106. (c):** No. of boys in school A in 2018
 $= \frac{60}{100} \times 1160 = 696$
No. of girls in school A in 2018 = $\frac{40}{100} \times 500 = 200$
Required total = 696 + 200 = 896

- 107. (d):** No. of boys in school A in 2015
 $= \frac{3}{8} \times 600 = 225$
Let no. of boys in school B in 2016 be x
 \therefore no. of girls = 0.6x.
 $x + 0.6x = 400$
 $x = 250$
Required ratio = $\frac{225}{0.6 \times 250} = 3 : 2$
- 108. (e):** Required average
 $= \frac{480+360+500+400+240}{5} = \frac{1980}{5} = 396$
- 109. (a):** Required % = $\frac{(680+480)}{(520+240)} \times 100$
 $= \frac{1160}{760} \times 100 = 152.63\% \approx 153\%$
- 110. (b):** Let no. of boys in school B in 2014 be x & no. of girls be y.
ATQ,
 $x + y = 360$... (i)
 $y - x = 160$... (ii)
adding (i) & (ii)
 $y = 260, x = 100$
No. of boys in school A in 2017
 $= 520 \times \frac{5}{13} = 200$
Required difference = 200 - 100 = 100
- 111. (d):** Books sold by D & E together in 2018 = 78000 + 82000 = 160000
Book sold by B & F together in 2017 = 50000 + 90000 = 140000
Required % = $\frac{160000-140000}{140000} \times 100$
 $= \frac{100}{7} \% = 14\frac{2}{7} \%$
- 112. (a):** Books sold by A & C together in 2017 = 72000 + 48000 = 120000
Books sold by E & F together in 2018 = 82000 + 56000 = 138000
Required ratio = $\frac{120000}{138000} = 20 : 23$
- 113. (b):** Average number of books sold by A, B & D in 2017
 $= \frac{72000+50000+64000}{3} = 62000$
Average number of books sold by C & E in 2018 = $\frac{70000+82000}{2} = 76000$
Required difference = 76000 - 62000 = 14000
- 114. (e):** Books sold by A, C & F together in 2017 = 72000 + 48000 + 90000 = 210000
Books sold by A, D & E together in 2018 = 90000 + 78000 + 82000 = 250000
Required % = $\frac{210000}{250000} \times 100$
= 84%

115. (b): Total books sold by all 6 companies in 2018
 $= 90000 + 84000 + 70000 + 78000 + 82000 + 56000 = 460000$
 Total books sold by all 6 companies in 2017
 $= 72000 + 50000 + 48000 + 64000 + 56000 + 90000 = 380000$

$$\text{Required \%} = \frac{460000 - 380000}{380000} \times 100$$

$$= \frac{400}{19} \% = 21.052 \% = 20\% \text{ (approx.)}$$

116. (d): percentage of students who written exam in Hindi and got selected in year 2017 = $100 - 60 = 40\%$
 Total no. of students selected in year 2017 = $\frac{450}{(60-40)} \times 100 = 2250$

$$\text{Total selection in 2015} = \frac{2250}{90} \times 100 = 2500$$

117. (a): let total selection in year 2014 and 2016 are $2x$ and $3x$ respectively

$$\text{Required ratio} = 2x \times \frac{100-38}{100} : 3x \times \frac{100-42}{100}$$

$$= 2x \times 62 : 3x \times 58$$

$$= 62:87$$

118. (b): let no. of selection in each year are $100x$ ATQ

$$\frac{38x + 68x + 56x}{100} \times \frac{1}{3} \times 100x = 540$$

$$x = 10$$

No. of selection in each year = 1000

119. (d): let total selection in 2015 and 2018 are x and y respectively

$$x(100 - 68) = y(100 - 56)$$

$$\frac{x}{y} = \frac{44}{32}$$

$$x:y = 11:8$$

120. (a): total no. of selection in 2014 = $\frac{380}{38} \times 100 = 1000$
 Total no. of selection in 2017 = $\frac{480}{60} \times 100 = 800$
 Required percentage
 $= \frac{1000-800}{1000} \times 100 = 20\% \text{ less}$

121. (b): maximum no. of students in any year = 50000
 Minimum no. of students in any year = 15000
 Required percentage
 $= \frac{50000-15000}{15000} \times 100 = 233.33\%$

122. (a): required ratio = $\frac{42000+25000+30000}{3} : \frac{35000+50000}{2}$
 $= 194:255$

123. (e): no. of boys who joined for banking in 2016
 $= \frac{38000}{19} \times 11 = 22000$
 Let no. of girls who joined for ssc in 2016 = $4x$
 Then no. of boys who joined for ssc in 2016
 $= 4x \times \frac{75}{100} = 3x$
 No. of girls who joined for ssc in 2016
 $= \frac{35000}{7x} \times 4x = 20000$
 Required difference = $22000 - 20000 = 2000$

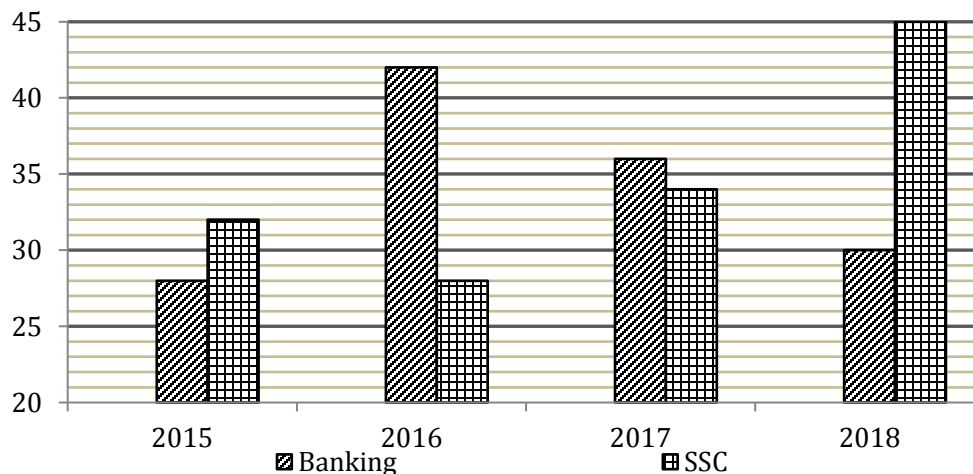
124. (c): average no of students qualified in ssc and banking in 2014 = $\frac{25000 \times \frac{50}{100} + 45000 \times \frac{25}{100}}{2} = 11875$
 No. of students qualified in railways in 2014 = $42000 \times \frac{20}{100} = 8400$
 Required difference = $11875 - 8400 = 3475$

125. (a): required percentage = $\frac{28000}{42000} \times 100 = 66\frac{2}{3} \%$

Practice MCQs for Mains

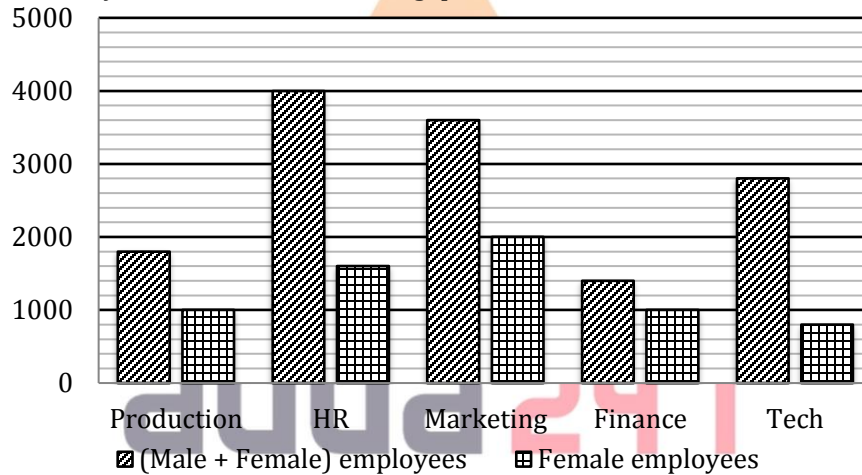
Direction (1-5): The Bar graph shows the no. of Students (in %) enrolled in two different courses out of three different courses for four different years of "Career Power" coaching. Study the graph carefully to answer the following questions.

Total no. of Student= (SSC + Banking + Upsc) Students



- If total student in 2015 & 2017 are in ratio of 4:5 and the difference between no. of Upsc students in these two years is 180 then find the difference between no. of Banking students in these two years?
(a) 1218 (b) 1332 (c) 1418 (d) 1224 (e) 1350
- If total student in 2015 is 8000 and increased at 10% annually for the following years then find in which year the no. of Upsc student was third highest?
(a) 2016 (b) 2018 (c) 2017 (d) none of these (e) can't be determined
- For how many year the no. of Upsc student is more than the average of the no. of student of the rest two courses?
(a) 0 (b) 2 (c) 3 (d) 1 (e) None of these
- If the total no. of students is constant for all the years then find in which year the difference between no. of upsc students and SSC students is second lowest?
(a) 2015 (b) 2016 (c) 2017 (d) 2018 (e) none of these
- If the ratio of upsc students in 2015,2017,2018 be 6:3:5 and difference between Banking and SSC students in 2018 Is 300, then find the average no. of SSC students in 2015 and 2017 together?
(a) 590 (b) 640 (c) 240 (d) 190 (e) 410

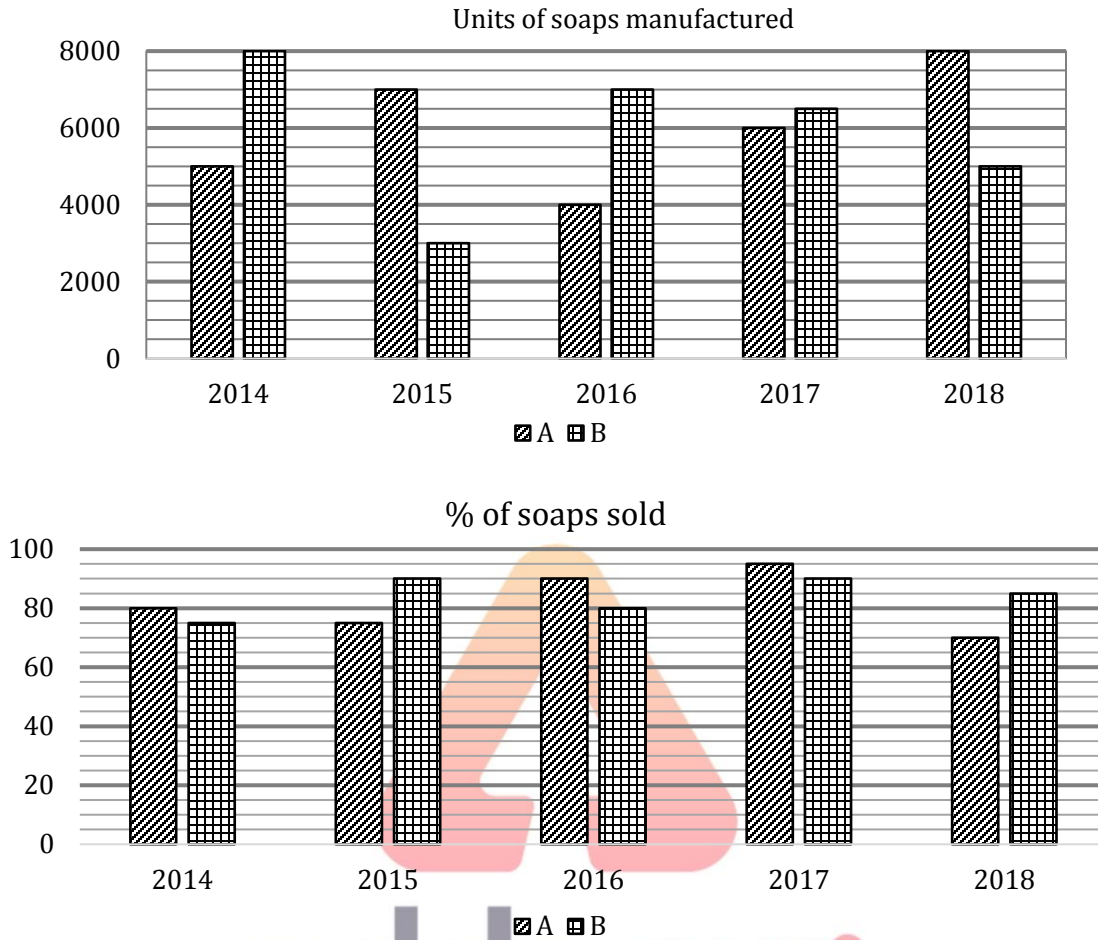
Direction (6-10): Bar graph given below shows total number of employees (male + female) in five different departments (production, finance, HR, tech & marketing) of a company and number of female employees in these departments of the company. Study the data carefully and answer the following questions.



- Find the ratio between total number of employees (male + female) who are in HR, Marketing and Finance department together to total number of male employees who are in Production and Tech department together.
(a) None of the given options (b) 15 : 4 (c) 45 : 16
(d) 45 : 14 (e) 3 : 1
- Total number of female employees who are in HR & Tech department is how much more or less than total male employees who are in Marketing and Finance?
(a) 400 (b) 420 (c) 350 (d) 380 (e) 450
- Total male employees who are in HR and Tech department together are what percent more than total female employees in Production and Finance department together?
(a) 130% (b) 110% (c) 120% (d) 150% (e) 140%
- If out of total male employees and total female employees who are in Production department, 15% and 18% respectively left the company. Find total employees (male + female) who left the company from Production department are what percent of total employees (male + female) who are in Finance department?
(a) $35\frac{4}{7}\%$ (b) $21\frac{3}{7}\%$ (c) $28\frac{6}{7}\%$ (d) $25\frac{2}{7}\%$ (e) $32\frac{4}{7}\%$
- Find the average number of male employees who are in HR, Finance and Tech department.
(a) 1540 (b) 1600 (c) 1720 (d) 1680 (e) 1620

Directions (11-15): Study the bar charts given below and answer the following questions.

Bar chart shows the units of soaps manufactured by two different companies (A & B) in 5 different years and percentage of soaps sold by these 2 companies in these 5 years. Both companies started their production from 2014.

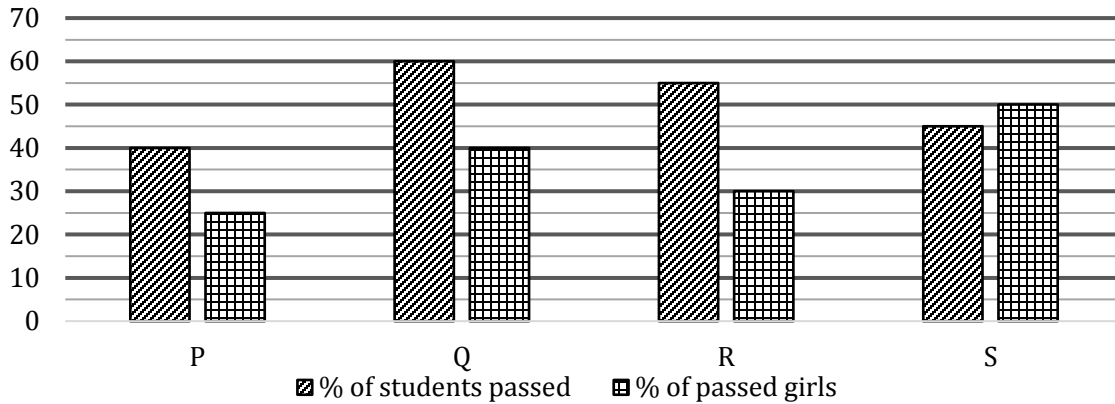


Note -

- Soaps available for selling in any year = Soaps manufactured in that year + unsold soaps of previous year.
- % of soaps sold in any year = $\frac{\text{Soaps sold in that year}}{\text{Soaps available for selling in that year}} \times 100$

11. Soaps sold by A & B together in 2016 are what percent of unsold soaps of B in 2014 & 2016 together?
 (a) $325\frac{5}{7}\%$ (b) $342\frac{5}{7}\%$ (c) $276\frac{5}{7}\%$ (d) $254\frac{5}{7}\%$ (e) $306\frac{5}{7}\%$
12. Average of unsold units of B in all 5 years is how much more or less than unsold units of A in 2016 & 2017 together?
 (a) 244 (b) 282 (c) 268 (d) 204 (e) 238
13. If in 2019 soaps manufactured by A & B are 25% more and 30% less respectively as compared to previous year and soaps sold by A in 2019 are 30% more than that of sold by A in 2015 and soaps sold by B in 2019 are 80% more than unsold soaps of B in 2016, then find soaps sold by A & B together in 2019 are what percent of soaps manufactured by A & B together in 2019?
 (a) $85\frac{7}{9}\%$ (b) $77\frac{7}{9}\%$ (c) $71\frac{7}{9}\%$ (d) $62\frac{7}{9}\%$ (e) $94\frac{7}{9}\%$
14. If selling price of each soap of A & B in all years is Rs.13 & Rs.17 respectively, then find revenue of A in 2016, 2017 & 2018 together is how much more or less than revenue of B in 2015, 2016 & 2017 together?
 (a) Rs.85,478 (b) Rs.73,387 (c) Rs.61,792 (d) Rs.68,456 (e) Rs.79,889
15. If cost price and selling price of each unit of soap of B in all the given years is Rs.15 & Rs.15.80 respectively and B threw all its unsold units of soaps in 2018 as B closed down in 2018, then find approximate profit/loss percentage of B over all the 5 given years together.
 (a) 8% (b) 10% (c) 13% (d) 7% (e) 2%

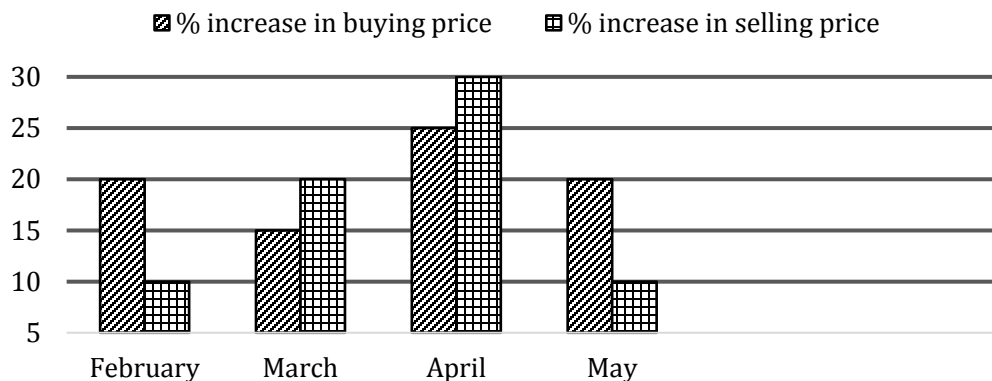
Direction (16 – 20) : Bar graph given below shows percentage of students passed out of total students in four different schools and percentage of girls passed out of total passed students in these four different schools in annual exam. Read the data carefully and answer the questions.



16. Total boys passed from P is 900 and total girls failed from Q is 640. If total girls failed from Q is 36% less than of total students failed from Q, then find ratio of total students participated in exam from Q to that of from P?
 (a) 5 : 9 (b) 5 : 7 (c) 3 : 5 (d) 5 : 6 (e) 4 : 7
17. Total boys failed from school Q is 60% of total students failed from that school and total boys passed from same school is 1440. Total failed boys from R is 192 more than total female passed from same school. Find difference between total girls failed from Q & R, if boys failed from R is 42% less than total students failed from R.
 (a) 272 (b) 242 (c) 252 (d) 240 (e) 262
18. If total number of girls passed from S is 1125 and total failed boys are $133\frac{1}{3}\%$ more than that of total failed girls from same school, then find difference between number of failed boys and failed girls from school S?
 (a) 1100 (b) 1000 (c) 1110 (d) 900 (e) 1200
19. If difference between passed boys and passed girls from P is 600 and total boys passed from S is 1350, then find total failed students from S is what percent more than total students participated from school P?
 (a) 15% (b) 10% (c) 12% (d) 5% (e) 20%
20. Total students participated in exam from school R is 50% more than that of from P and difference between passed boys from both the school is 2220, then find average number of girls passed from both the schools?
 (a) 1100 (b) 1000 (c) 1390 (d) 900 (e) 1200

Directions (21 – 24): Study the bar chart given below carefully and answer the following questions.

Bar chart shows percentage increase in buying price and in selling price of one share of RIL as compared to its respective buying price and selling price in the previous month.



Note – Buying price of 1 share of RIL in Januray is Rs.50000 and selling price of 1 share of RIL in Januray is Rs.50000. Buying price/selling price of 1 share of RIL in every month remains uniform throughout the month.

- 21.** Shivam purchased two shares of RIL: one in February and other in March. If he sold both shares of RIL in April, then find the total profit earned by Shivam?
 (a) Rs 58700 (b) Rs 52500 (c) Rs 42600 (d) Rs 46800 (e) Rs 49400
- 22.** In the month of March, Deepak and Mohit purchased total 10 shares of RIL and ratio of shares of RIL bought by Deepak to that by Mohit is 3 : 2. If both Deepak and Mohit sold their shares of RIL in May, then find the difference in profit share of Deepak and Mohit.
 (a) Rs 50760 (b) Rs 53280 (c) Rs 51680 (d) Rs 52360 (e) Rs 52580
- 23.** Selling price of 1 share of RIL in April is what percent more than buying price of 1 share of RIL in March?
 (a) $35\frac{13}{23}\%$ (b) $24\frac{8}{23}\%$ (c) $18\frac{9}{23}\%$ (d) $30\frac{15}{23}\%$ (e) None of the above.
- 24.** Find the ratio between selling price of 1 share of RIL in April to buying price of 1 share of RIL in March?
 (a) 13 : 11 (b) 130 : 109 (c) 143 : 115 (d) 69 : 64 (e) 151 : 117

Direction (25-29): Read the given information carefully and answer the following questions. The given graph shows the profit percentage of three companies in different years.

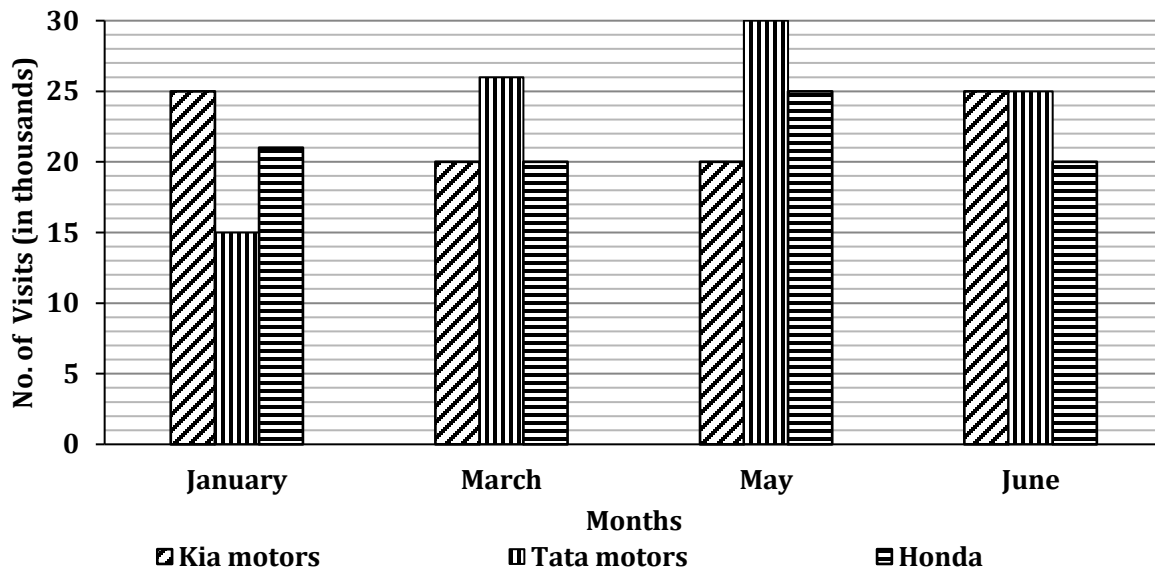
Profit = Income - Expenditure and profit percentage is calculated using income as a reference.



- 25.** What is the difference (in Rs. Lakhs) between the profits of A in 2000 and 2002? Assume that the expenditures of A in 2000 and 2002 were Rs. 9 lakhs and Rs. 10.2 lakhs respectively.
 (a) Rs 72,000 (b) Rs 60,000 (c) Rs 75,000 (d) Rs 80,000 (e) Rs 90,000
- 26.** The expenditure of B in 2004 was same as the expenditure of C in 2000, what was the ratio of the income of B in 2004 to that of C in 2000?
 (a) 3 : 2 (b) 1 : 1 (c) 5 : 4 (d) 2 : 3 (e) None of these
- 27.** The ratio of the incomes of A and B in 2008 was 5 : 4. What was the ratio of the expenditure of A to that of B in that year?
 (a) 10 : 7 (b) 10 : 9 (c) 5 : 4 (d) 3 : 2 (e) 6 : 5
- 28.** If the expenditure of A in 2002 was Rs 50 lakh and that of C and B together in that year is Rs 20 lakhs more than that of A, then what was the ratio of the income of A to that of B and C together?
 (a) 4 : 7 (b) 5 : 8 (c) 5 : 7 (d) 2 : 3 (e) 5 : 6
- 29.** The sum of income of C in 2006 and that of B in 2010 is Rs 15 lakh and expenditure of B in 2010 is Rs 1.8 lakhs more than the expenditure of C in 2006 then find the difference of their income in the given year?
 (a) 4.2 lakhs (b) 4 lakhs (c) 2.5 lakhs (d) 3 lakhs (e) 3.4 lakhs

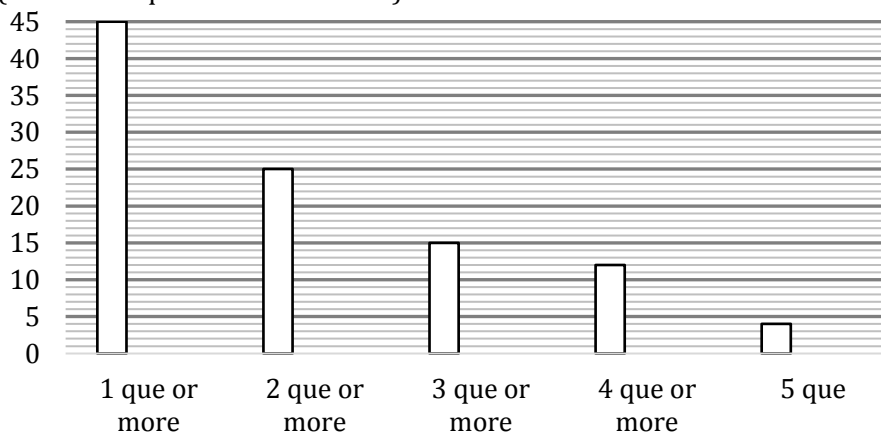
Directions (30-34): The given bar graph shows the number of visits on the website of 3 companies kia motors, Tata motors and Honda in 4 different months.

Study the graph carefully and answer the following questions-



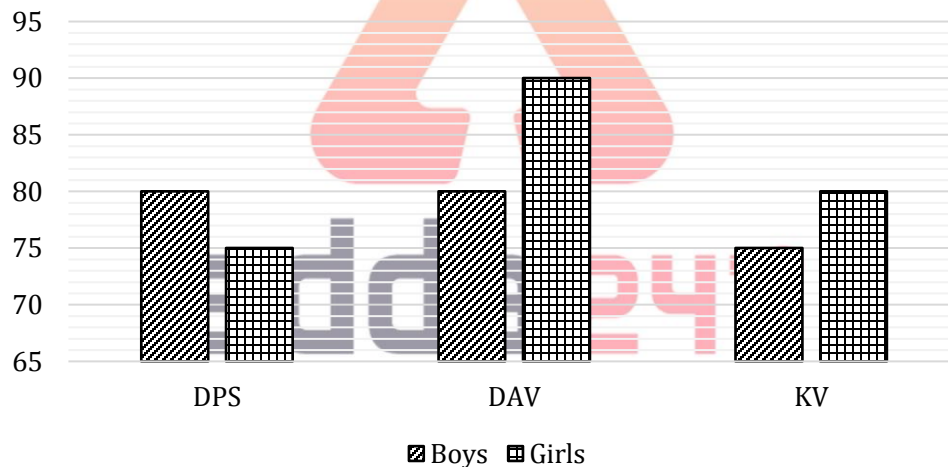
- 30.** By what percent, does the number of visits on website of Tata motors increased from January to May?
 (a) $33\frac{1}{3}\%$ (b) $66\frac{2}{3}\%$ (c) 50% (d) 100% (e) 25%
- 31.** What is the average number of visits on Honda motors website for all the given months?
 (a) 23750 (b) 21500 (c) 22500 (d) 22000 (e) 20000
- 32.** What is the difference in number of visits on website of kia motors in January & March together & Honda motors in May & June together?
 (a) 0 (b) 5000 (c) 10000 (d) 15000 (e) 20000
- 33.** The difference in number of visits on Tata motors website from May to June is same as
 (a) Kia motors, January to March (b) Honda, March to May (c) Honda, May to June
 (d) Tata motors, March to May (e) (a), (b) and (c)
- 34.** The average number of website visits on Kia motors in all the months is approximately what percent of average number of website visits of Tata motors in all the months?
 (a) 90% (b) 96% (c) 94% (d) 97% (e) 99%

Directions (35-39): Bar chart given below gives information of no. of students who attempted equal or more than 1 question, 2 questions, 3 questions and 4 questions or equal to 5 questions in an exam. There were 15 students who did not attempt any question. (total no. of question in exam is 5)



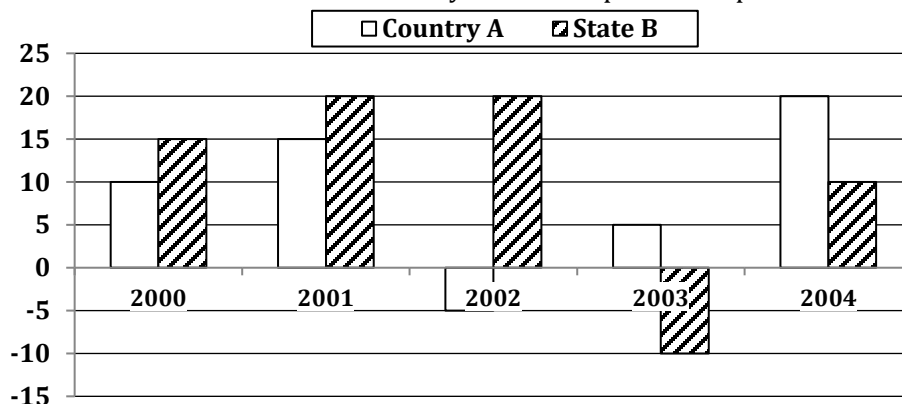
35. If no. of students who attempted less than 3 questions is considered fail. Find percentage of students who failed in exam?
 (a) 75% (b) 60% (c) 33.33% (d) 66.67% (e) None of these.
36. No. of students who attempted 2 questions is how much percent more or less than no. of students who attempted 4 or more questions?
 (a) $14\frac{2}{7}\%$ less (b) $16\frac{2}{3}\%$ less (c) 20% more (d) $14\frac{2}{3}\%$ more (e) 20% less
37. What is the ratio of no. of students who have attempted less than or equal to two questions to no. of students who attempted three questions? (consider students who attempted at least one questions)
 (a) 2:1 (b) 7:3 (c) Can't be determined. (d) 10:1 (e) 35:3
38. If 40% of students who attempted 1 or more question marked right answer and 40%, $33\frac{1}{3}\%$ and 75% of those who attempted 2 questions, 3 question and 4 questions respectively also marked right answer, find minimum no. of students who attempted 1 question and marked wrong answer? (consider any of the students marks all questions either right or wrong)
 (a) 12 (b) 17 (c) 8 (d) 3 (e) 20
39. No. of students who did not attempt any question is how much percent of students who attempted more than 3 questions?
 (a) 100% (b) 75% (c) 150% (d) 125% (e) None of these.

Direction (40 – 43): The given graph shows the number of boys and girls present (in terms of percentage of their respective number) in three different school of a town on a particular day. Read the given information carefully and answer the following question.



40. If ratio of number of girls present on that day in DPS, KV and DAV is 3 : 4 : 3, then find the ratio of total number of girls in these schools (KV : DAV : DPS) ?
 (a) 10 : 12 : 15 (b) 12 : 10 : 9 (c) 12 : 9 : 10 (d) 8 : 5 : 6 (e) 15 : 10 : 12
41. Number of boys present in KV on that day is 80% of the girls present. Total number of students present in DPS is $86\frac{1}{9}\%$ of the students present in KV and total students in DPS is 160% of the total girls in KV. Then boys present in DPS is what percent of the girls present in KV ?
 (a) 75% (b) 60% (c) 80% (d) 90% (e) 100%
42. Number of boys present in DPS and DAV together is 920. What could be maximum number of boys that are not present in DPS?
 (a) 225 (b) 229 (c) 220 (d) 228 (e) 233
43. Number of boys present in DAV is 440 and total number of boys in the school is 10% more than number of girls in the school. If average number of girls present in DPS and DAV is 450 then find difference between number of girls in DPS and total students present in DAV?
 (a) 280 (b) 284 (c) 290 (d) 292 (e) 296

Directions (44-47) : The bar graph given below shows the percentage increase/decrease in the production of wheat in a country 'A' with respect to the production in previous year. The bar graph also shows the percentage increase/decrease in the production of wheat in one of the states 'B' of country 'A' with respect to the production in previous year.



Note: 1. Country A produced 100 thousand kg of wheat in 1999 and the amount of production of wheat in state B in 1999 was 20% of the country's A production of wheat.

2. Values which are in negative value show decrease in production.

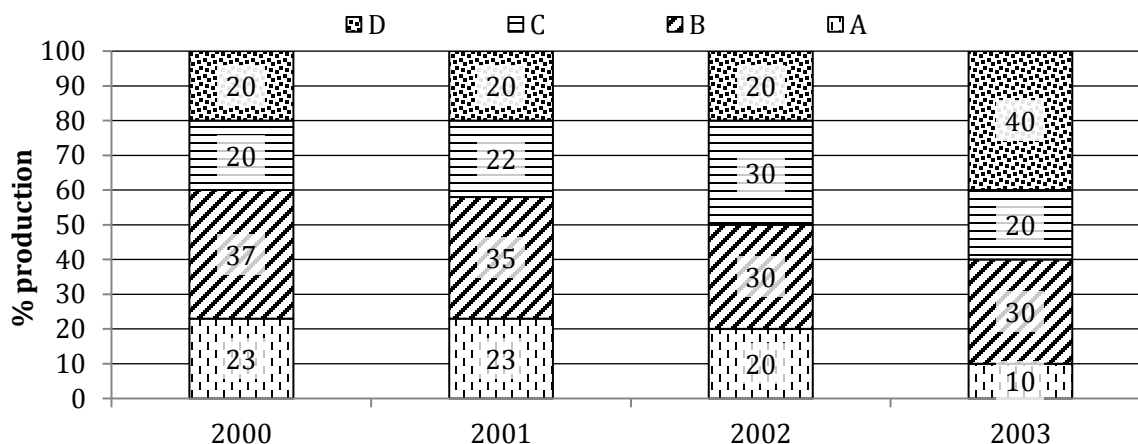
44. If the production of wheat in states B in 2001 is 60% of the production of wheat of state C in 2001 then what is the production of wheat in state C in 2001?
 (a) 46 thousand kg (b) 40 thousand kg (c) 50 thousand kg (d) 42 thousand kg (e) 43 thousand kg
45. The amount of production of wheat in state B in 2000 is what percent of the amount of production of wheat in the country A in 2002? (nearest integer value)
 (a) 10% (b) 19% (c) 25% (d) 29% (e) 33%
46. What is the difference between the amount of production in state B and the country A in the year 2003?
 (a) 140124.5 kg (b) 122612.5 kg (c) 96375.75 kg (d) 120141.5 kg (e) None
47. Find the ratio of the amount of production of wheat in state B in 2001 to that of the country A in year 2002?
 (a) 44 : 211 (b) 41 : 209 (c) 49 : 211 (d) 48 : 209 (e) 47:209
48. If the total production of wheat in state B in 2002 was 165600 kg, then find the total production of wheat in country A in the year of 2001?
 (a) 623500kg (b) 632500kg (c) 612500kg (d) 165200kg (e) 159200kg

Directions (49-53): In the given bar chart, Number of rural and urban people travelled in rail in a particular year is given. There are four quarters in a year and the following bar graph shows the percentage of number of people who travelled by rail are given for three quarters of the year. In the given graph, total number of people travelled by rail from rural area is 350 lakhs and that of urban area is 275 lakhs.

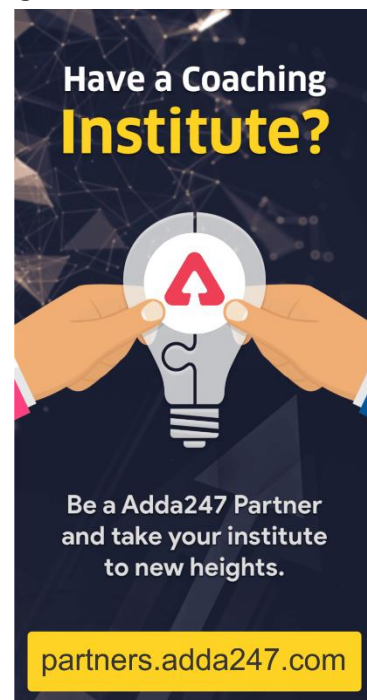


49. If we include the 4th quarter of the year, percentage of urban people travelled in 2nd quarter are 20% of the total urban people travelled in given year. Find the average number of urban people per quarter travelled in the given year?
 (a) 82.375 lakhs (b) 84.775 lakhs (c) 89.355 lakhs (d) 79.525 lakhs (e) 89.375 lakhs
50. Find the ratio between the number of urban people travelled in 1st and 3rd quarter together to the number of rural people travelled in 2nd and 3rd quarter together?
 (a) 112 : 235 (b) 235 : 112 (c) 490 : 407
 (d) 407 : 490 (e) 407:409
51. If we include the 4th quarter of the year, percentage of rural people travelled in 3rd quarter will become 14% of the total rural people travelled in the given year. Then what is the number of rural people travelled in 4th quarter?
 (a) 250 lakhs (b) 350 lakhs (c) 450 lakhs
 (d) 325 lakhs (e) 375lakhs
52. If the urban people travelled in IVth quarter is 45 lakhs less than the urban people travelled in IInd quarter. Then urban people travelled in 4th quarter are approximately what percent of total number of urban people travelled in the given year?
 (a) 5% (b) 9% (c) 13%
 (d) 6% (e) 12%
53. Average number of urban people travelled in 1st and 2nd quarter is how much percent more or less than the number of rural people in 1st quarter?
 (a) $31\frac{3}{7}\%$ (b) $29\frac{2}{7}\%$ (c) $35\frac{3}{11}\%$
 (d) $31\frac{4}{7}\%$ (e) $29\frac{3}{11}\%$

Directions (54-58): The bar chart shows the production % distribution of four type of article A, B, C and D in a firm for 4 years. It is given that the total production increases at the rate of 10% per annum comparison to the previous year in the period of 2000-2003. It is also known that the amount of production of article C in 2003 is 1320 Metric tonne (MT) more than the amount of production of article A in 2001.



54. If the growth rate of total production would have been 25% instead of 10% as given then what would have been the difference in the production of article C and article B in 2003? (If total production in 2000 is same as per the direction of the graph)
 (a) 19531.25 MT (b) 18253.75 MT (c) 19529.50 MT (d) 18654.25 MT (e) 19351.25MT

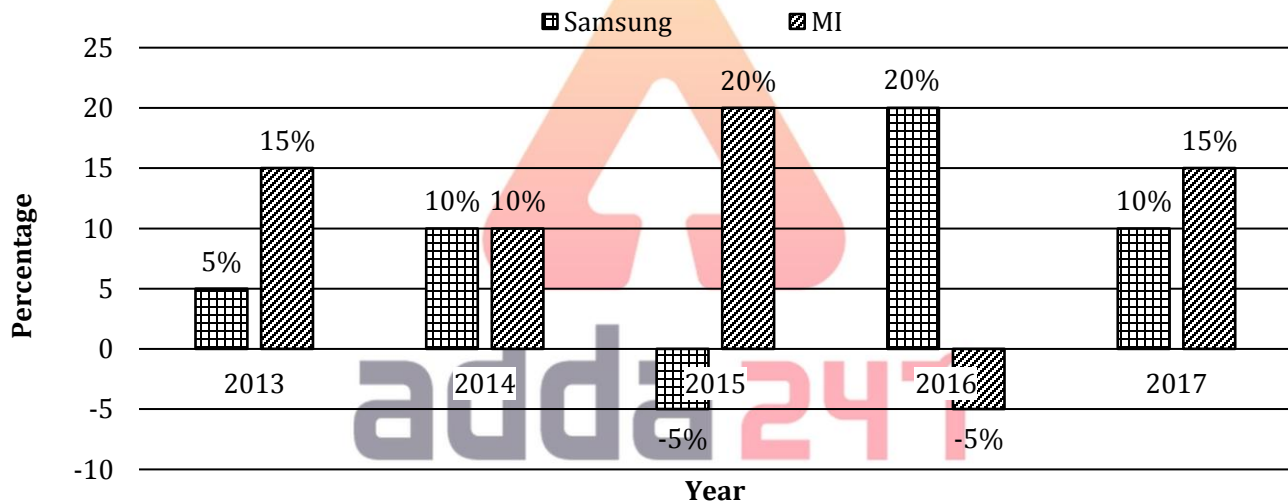


55. If the production of article D' in 2003 is 4191MT more than production of article A' in 2001, and the growth rate of total production would have been same as per direction given above then, what will be the difference in the production of C and B in 2003?
 (a) 2940.6125 MT (b) 3056.7521 MT (c) 1996.5MT (d) 3124.2596 M (e) 1969.5 MT
56. The price of product D is Rs. 150 per metric tons in 2002. The sales revenue contributed by D in 2002 will be :
 (a) Rs. 3630000 (b) Rs. 4356000 (c) Rs. 4536500 (d) Rs. 2354600 (e) Rs. 3663000
57. Which product has the largest total production in all of the given years?
 (a) B (b) C (c) D
 (d) A (e) Can't be determined
58. The percentage increase in the production of C for the period 2000-2002 is:
 (a) 81.5% (b) 85.5% (c) 75% (d) 85.6% (e) 89%

Directions (59-63): Given below the bar graph shows increase or decrease in percentage of sales of two type of mobile by seller as compare to previous year.

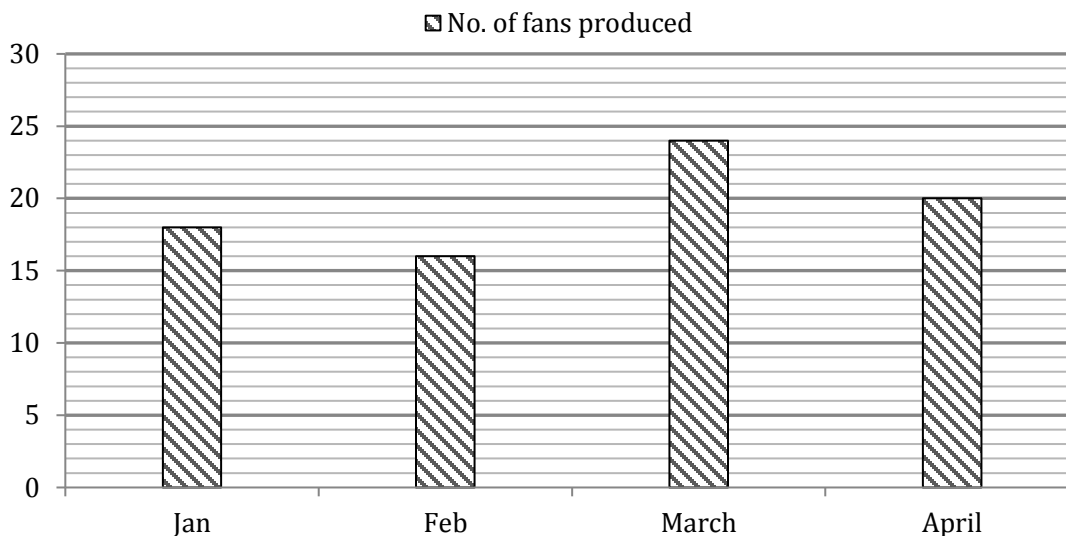
Note:

- MI phone sold in 2012 is 80% of Samsung phone sold in the same year
- Negative % shows decrease in percentage of sales comparison to previous year
- Increment or decrement in percentage of sales is related to the actual sale of previous year
- Actual phone sold means total sale after returning phones).



59. If total number of MI phones sold in 2014 is 708400. Then find the total number of Samsung phones sold in 2015?
 (a) 767605 (b) 678075 (c) 768075 (d) 767075 (e) 760775
60. Seller have to return 10% of MI phones and 15% of Samsung phones sold in 2012 then the difference between MI phone and Samsung phone sold in 2012 in actual is 13000, then find total MI phone sold in 2013 in actual?
 (a) 82,800 (b) 88,200 (c) 88,820 (d) 82,880 (e) 88,880
61. Total MI phones sold in 2013 is what percent of total Samsung phones sold in 2014?
 (a) $65\frac{149}{231}\%$ (b) $79\frac{151}{231}\%$ (c) $69\frac{149}{231}\%$ (d) $78\frac{139}{231}\%$ (e) 80%
62. 25% of MI phone sold in 2013 return by customer, then find the ratio between actual MI phone sold in 2013 to total Samsung phone sold in 2016?
 (a) 3300 : 4389 (b) 2300 : 2389 (c) 1900 : 2389 (d) 2300 : 4389 (e) 2200 : 4389
63. If selling price of Samsung mobile is 25% more than MI phone in year 2013 and total selling price of Samsung phones in the same year i.e., in 2013 is 210000\$. then find the selling price of each MI phones for the year 2013, if total difference between MI and Samsung sold in 2012 is 5000?
 (a) 6.4\$ (b) 6\$ (c) 7\$ (d) 4\$ (e) 4.5\$

Directions (64-68): Bar graph shows the number of fans produced (in hundreds) by a manufacturer in the period of four months i.e., from January to April.



Shopkeeper has to decide whether to test or not all the units of fans before sending them to the customer. If he has decided to test, he has two options.

(a) Option I

(b) Option II

Option I : - It cost Rs 2.50 per unit as testing cost but this method of testing allows 30% of defective fans to pass to the customer.

Option II : - It cost Rs 4 per unit as testing cost and it find 90% of defective units

→ All defective units identified at the customer end, will causes a penalty of Rs 60 per units. Which are to be paid by shopkeeper. Defective units found during testing are repaired at Rs 20 per unit.

64. Shopkeeper uses option I testing in March month and incurs repairing cost of. Rs 5600. Then find number of defective fans in March is what percent of total manufactured fans in that month?

- (a) $12\frac{1}{2}\%$ (b) 15% (c) $16\frac{2}{3}\%$ (d) $17\frac{1}{2}\%$ (e) 20%

65. For February month, find the difference of the extra (i.e. total of testing, repairing cost and penalties) incurred by the shopkeeper. For the both options if 150 units are defective in that months.

- (a) Rs 1000 (b) Rs 1200 (c) Rs 1250 (d) Rs 1400 (e) Rs 1350

66. Find ratio of all defective units of January to April months if in January he uses option I for testing and in April, option II as testing. Repairing cost of April is Rs 5300 more than that of January whereas penalties for January is Rs 900 more than that of April

- (a) 3 : 8 (b) 2 : 5 (c) 11 : 18 (d) 4 : 9 (e) 8 : 15

67. In May, shopkeeper uses option II for testing the whole units of fans produced and he has to pay penalties of Rs 1620 to the customer. Then, find the total units of fans manufactured in that month if total defective units are $25\frac{5}{7}\%$ in that month.

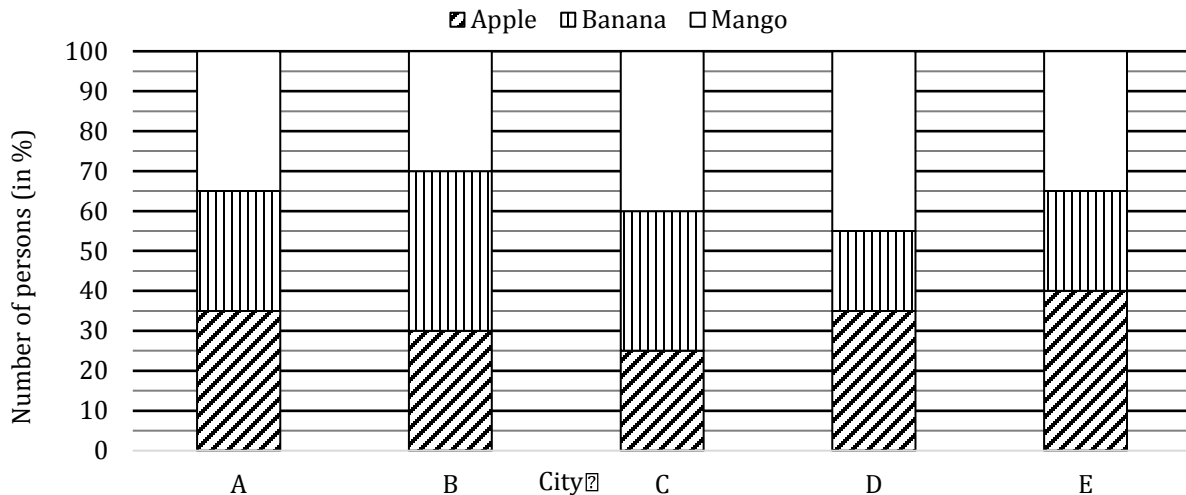
- (a) 980 (b) 1050 (c) 1071 (d) 1106 (e) 1120

68. Shopkeeper use option I testing in month of April and incurs repairing cost of Rs. 4200. Then find the total penalty cost in this month?

- (a) 6000 (b) 8400 (c) 9000 (d) 7200 (e) 5400

Directions (69-73): Given below is the bar graph which shows the percentage of persons who like three different types of fruits in five different cities. Study the data carefully and answer the following questions.

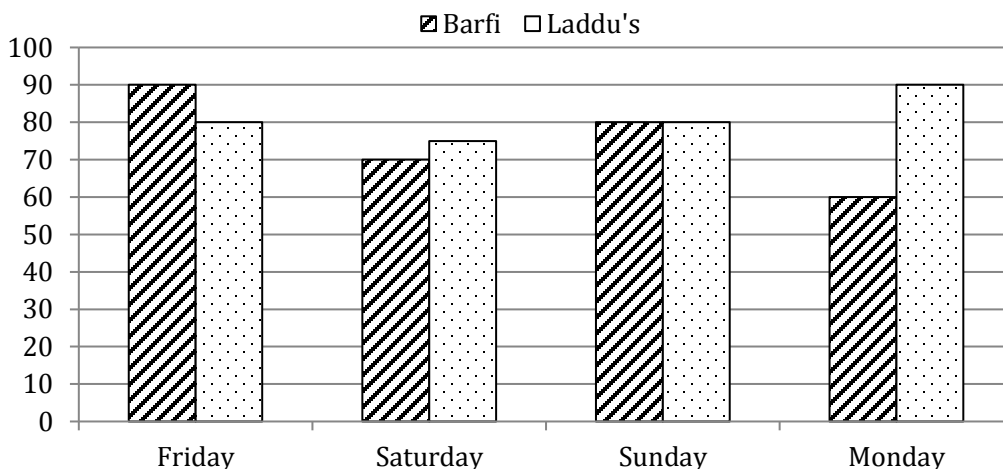
Note: One person likes only one type of fruit.



69. If difference between number of persons who like apple to persons who like banana in city A is 51 while average number of person who like mango and apple in city B is 765, then find the ratio of total number of person in city A to total number of person in city B.
 (a) 3 : 5 (b) 2 : 5 (c) 1 : 3 (d) 3 : 7 (e) 15 : 17
70. Find the total number of person in city D. If total number of persons in city D is 200% more than that of in city C, while difference between number of person who like banana in city D to number of person who like apple in city C is 588.
 (a) 1680 (b) 7840 (c) 3920 (d) 3360 (e) 5040
71. Find the total number of person in city E who like Apple if difference between number of person who like Apple and Mango together and number of person who like Mango and banana together in city E is Rs 240.
 (a) 950 (b) 280 (c) 230 (d) 640 (e) 140
72. If Difference between number of person who like apple in city D to person who like Mango in city E is 2100 while sum of number of person who like Mango in city D and number of person who like banana in city E is 4100, then find total number of person in city D is what percent more than that in city E?
 (a) 75% (b) 300% (c) 150% (d) 175% (e) 225%
73. Find total number of person in city B, if ratio of number of person in city A to City B is 2 : 3 and total number of person in city A & city B together who like apple is 816.
 (a) 510 (b) 1020 (c) 1530 (d) 2040 (e) 765

Directions (74–78): The bar graph shows % of sweets sold by a famous shop out of the total sweets that he prepared. Answer the questions based on this information.

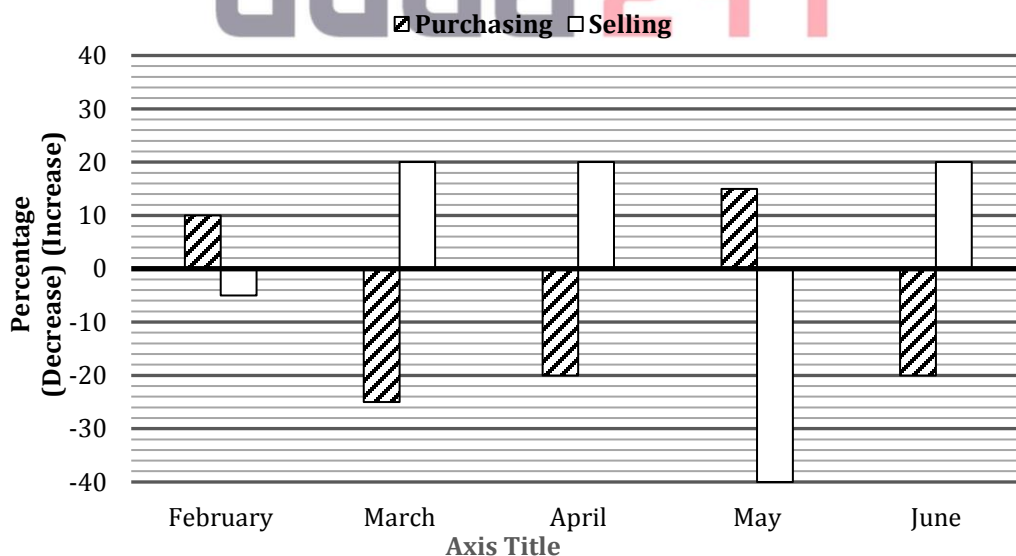
Note: All the units of sweets are given in KG's unless mentioned.



74. Shopkeeper prepared $66\frac{2}{3}\%$ more 'Laddu' on Sunday than that of Saturday. Total number of Barfi prepared on Sunday and Saturday are equal to total number of Laddu prepared in these two days. Barfi prepared on both of days are equal in quantity then find number of Laddu that remained unsold on Sunday, given that difference between total sold Barfi to total sold Laddu in these two days is 100kg.
 (a) 2400 (b) 1200 (c) 900 (d) 1600 (e) None of these
75. Ratio of Laddu prepared on Friday and Laddu sold on Monday together to total number of Laddu prepared on Friday and Monday is 113 : 120. He earns profit of Rs. 20/kg on selling Laddu and no loss on unsold Laddu. If total profit earned on Monday is Rs. 11040 more than that of Friday on selling Laddu then find quantity of Laddu prepared by him on Monday.
 (a) 1680 kg (b) 1600 kg (c) 1800 kg (d) 1512 kg (e) 1200 kg
76. Quantity of Laddu sold on Friday is equal to quantity of Barfi sold on Monday. Calculate the quantity of Barfis prepared on Friday, if he prepared 80 kg more Laddu than Barfi on each day. (Friday and Monday) and Barfi's prepared on Friday is 30% less than Barfi's prepared on Monday.
 (a) 1000 kg (b) 1600 kg (c) 1120 kg (d) 1200 kg (e) 1680 kg
77. If he earns a profit of Rs. 10/kg on selling each sweets and loss of Rs. 10/800 gm on unsold items. Find his approximate profit % on Saturday, if it cost Rs. 200/kg to prepare each sweets and ratio of Laddu prepared to Barfi prepared is 5 : 4 on Saturday.
 (a) 2% (b) 5% (c) 10% (d) 12% (e) can't be determined
78. Find the approximate average % of sweets sold on Saturday, Sunday and Monday together if shopkeeper prepared same quantity of Barfi on these days and ratio of Barfi to laddu prepared in these 3 days is 4 : 3, 4 : 5 and 20 : 21 respectively.
 (a) 85 (b) 76 (c) 60 (d) 68 (e) 65

Directions (79- 83): Given below bar graph shows percentage increase and decrease in the purchasing and selling price of one Ripple in five different months of year 2017. Negative percentage shows decrease in price and positive percentage shows increase in price, with respect of previous month price

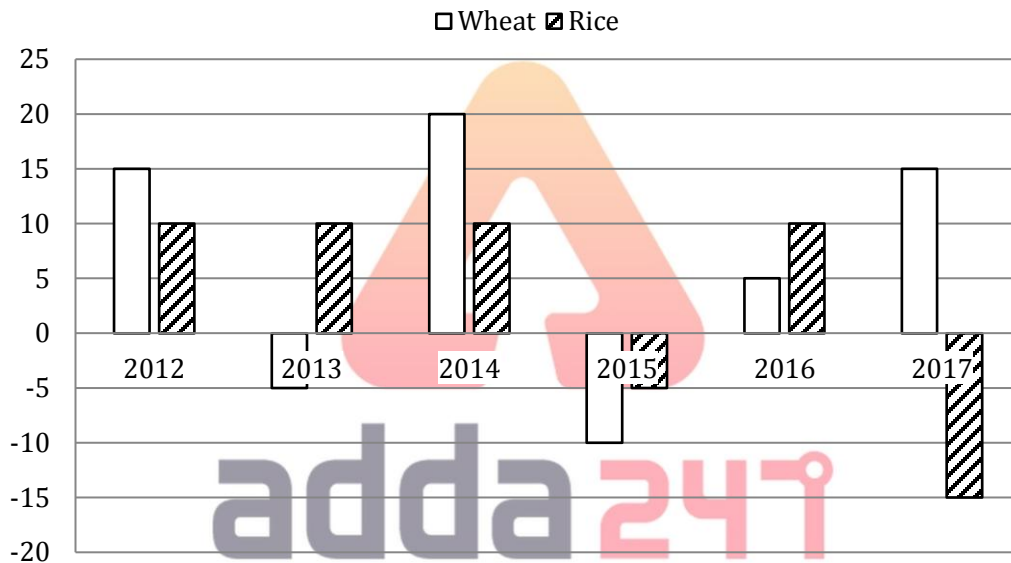
(Note- Purchasing price of one ripple in January 2017 was 240 Rs and Selling price was 280 Rs in same month).



79. Aman purchased ten Ripple in month January and five Ripple in month of February and Sells all ripple in month April. Find total profit obtained by Aman?
 (a) 2020.6 Rs (b) 2025.6 Rs (c) 2075.6Rs (d) 2035.6 Rs (e) 2045.6 Rs

80. If in the month of February Ayush and Divyaraj both purchased 45 Ripple in partnership in the ratio of 1 : 2 respectively. If they sold all Ripple in month of April, then find profit share of Divyaraj out of total profit?
 (a) 3576.2 (b) 3578.2 (c) 3571.2 (d) 3577.2 (e) 3574.2
81. Purchasing price of one Ripple in month of march is approximately what percent less than selling price of one Ripple in month of April?
 (a) 38% (b) 56% (c) 36% (d) 42% (e) 48%
82. Find the Ratio between purchasing price of one Ripple in month of April to selling price of one Ripple in month of April?
 (a) 1955 : 4788 (b) 1925 : 4788 (c) 9788 : 1955 (d) 1935 : 4688 (e) 3 : 5
83. Purchasing price of one Ripple in month of may is approximately what percent of selling price of one Ripple in month of March?
 (a) 49% (b) 51% (c) 57% (d) 63% (e) 65%

Directions (84-88): Bar graph given below shows percentage increase or decrease in production of wheat and rice in six different years with respect to base year 2011. Answer the following questions based on given data.

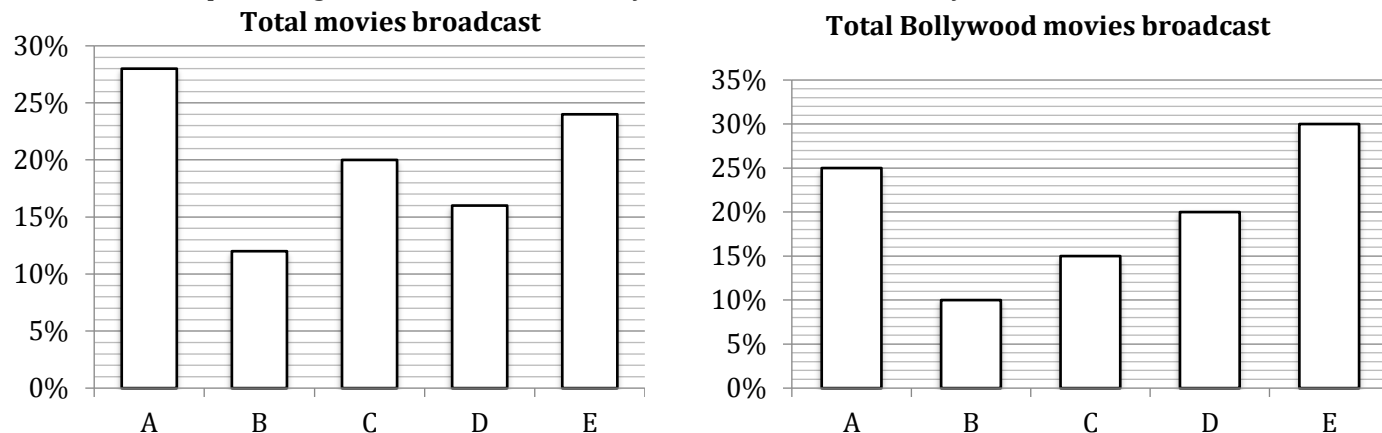


Note: -

- Positive percentage shows increase in production while negative percentage shows decrease in production
 - Production of Wheat in 2011 was 75% of production of Rice in 2011.
84. If production of Rice in 2014 was 440 quintals, then find production of Wheat in 2013?
 (a) 275 quintals (b) 255 quintals (c) 265 quintals (d) 285 quintals (e) 295 quintals
85. Average production of Wheat in 2016 and 2017 together is what percent of average production of Rice in 2016 and 2017 together?
 (a) $76\frac{9}{13}\%$ (b) $62\frac{4}{13}\%$ (c) $84\frac{8}{13}\%$ (d) $51\frac{7}{13}\%$ (e) $48\frac{12}{13}\%$
86. Production of Wheat in 2014 is what percent more/less than production of Rice in 2013?
 (a) $18\frac{2}{11}\%$ (b) $9\frac{1}{11}\%$ (c) $11\frac{1}{9}\%$ (d) $12\frac{1}{2}\%$ (e) $15\frac{3}{11}\%$
87. Production of Rice in 2014 and 2015 together is how much more/less than production of Wheat in 2016 and 2017 together, if 285 quintals of Wheat was produced in 2013?
 (a) 280 (b) 135 (c) 270 (d) 150 (e) 160
88. Find ratio between average production of Rice in all six years to average production of Wheat in all six years.
 (a) 25 : 24 (b) 31 : 24 (c) 50 : 27 (d) 42 : 23 (e) 37 : 31

Directions (89-93): Study the pie charts given below and answer the following questions.

First bar chart shows the percentage distribution of total movies broadcast by five different channels in a week and second bar chart shows percentage distribution of total Bollywood movies broadcast by these five channels in this week.



Note – Total movies broadcast by any channel = Total (Bollywood + Hollywood) movies broadcast by that channel

89. Total Hollywood movies broadcast by A is 170 more than that of by C. If total Hollywood movies broadcast by B & D together is 670, then find total number of number Bollywood movies broadcast by E?

- (a) 300 (b) 225 (c) 375 (d) 450 (e) 150

90. Total movies broadcast by C & D together are 1200 more than total Bollywood movies broadcast by B & E together. If total Hollywood movies broadcast by E are 30% of the total movies broadcast by C, then find total Bollywood movies broadcast by all five channels?

- (a) 5000 (b) 6500 (c) 5500 (d) 7000 (e) 6000

91. Total Bollywood movies broadcast by E are $42\frac{6}{7}\%$ of total movies broadcast by A. If difference between total Hollywood movies broadcast by B & A is 750, then find total Hollywood movies broadcast by E?

- (a) 500 (b) 900 (c) 600 (d) 1200 (e) 1000

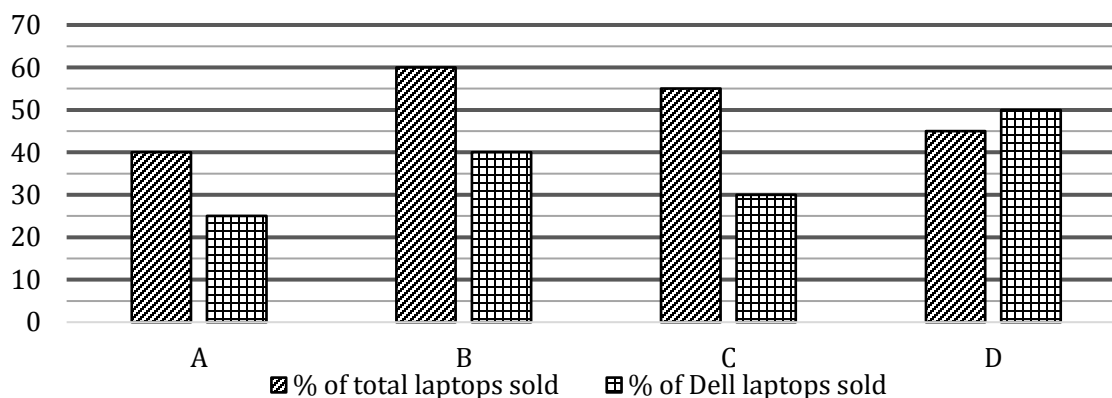
92. The ratio of total Bollywood movies to total Hollywood movies broadcast by A and C together is 5 : 11 respectively. If total Hollywood movies broadcast by E are 510, then find difference between total Bollywood movies and total Hollywood movies broadcast by the all five channels.

- (a) 1650 (b) 1300 (c) 750 (d) 1000 (e) 950

93. Average number of movies broadcast by C, D and E is 200 more than average number of Bollywood movies broadcast by A, C and D. If total Hollywood movies broadcast by C is 50 more than total Bollywood movies broadcast by same channel, then find total movies broadcast by all the five channels.

- (a) 4000 (b) 5000 (c) 4500 (d) 3500 (e) 2500

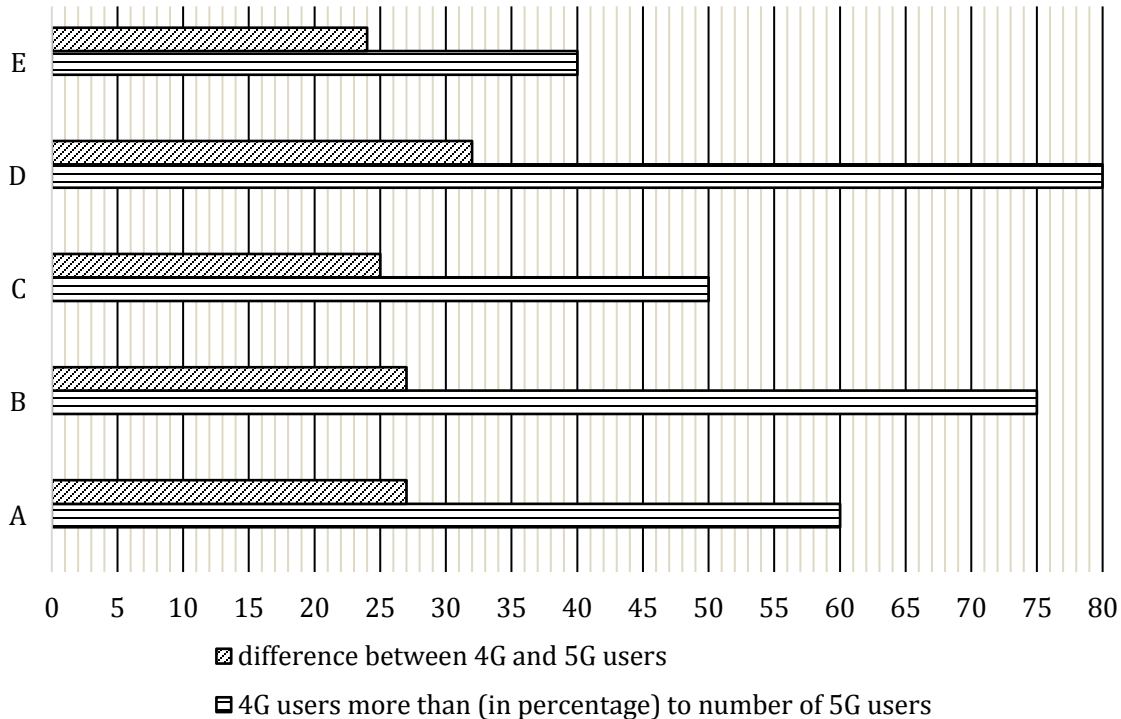
Direction (94– 97): Bar graph given below shows percentage of laptops sold out of total laptop manufactured by four different companies and percentage of Dell laptops sold out of total sold laptops by these four different companies. Read the data carefully and answer the questions.



Note – Each company manufacture or sold only two brands (Dell and HP) laptops.

94. Total HP laptops sold by A is 1800 and total unsold Dell laptops of B is 1280. If total unsold Dell laptops of B is 36% less than of total unsold laptops by B, then find ratio of total laptops manufacture by B to that of by A?
 (a) 5 : 9 (b) 5 : 7 (c) 3 : 5 (d) 5 : 6 (e) 4 : 7
95. Total unsold HP laptops of B is 60% of unsold laptops by B and total HP laptops sold by B is 2880. Total unsold Dell laptops of C is 384 more than total Dell laptops sold by same company. If total unsold HP laptops by C is 42% of total unsold laptops by company, then find difference between total unsold Dell laptops by B & C?
 (a) 246 (b) 196 (c) 216 (d) 276 (e) 236
96. If total number of Dell laptops sold by D is 2250 and total unsold HP laptops are $133\frac{1}{3}\%$ more than that of total unsold Dell laptops by the same company, then find difference between number of unsold HP & unsold Dell laptops of D?
 (a) 2200 (b) 2000 (c) 2220 (d) 1800 (e) 2400
97. If difference between total sold HP and total sold Dell laptops by A is 1200 and total sold HP laptops by D is 2700, then find total unsold laptops by D is what percent more than total laptops manufactured by A?
 (a) 15% (b) 10% (c) 12% (d) 5% (e) 20%

Direction (98 – 100): Bar graph given below shows number of 4G users more than (in percentage) to number of 5G users in five offices and difference between 4G and 5G users (in '0) in these five offices. Read the data carefully and answer the questions.



98. The average number of 5G users in A, B & E together are how much less than average number of 4G users in C & D together?
 (a) 245 (b) 265 (c) 255 (d) 245 (e) 235
99. Total 5G users in X are 40% more than total 5G users in C and total 4G users in X are 25% more than total 4G users in E. Find total 4G users in X are what percent more than 5G users?
 (a) 50% (b) 40% (c) 45% (d) 60% (e) 64%
100. If Jio provides all 4G and 5G services in all given offices and cost for each 4G and 5G user is Rs. 50 & Rs. 80 respectively, then find total revenue gets by Jio from A & E together (in Rs.)?
 (a) 162000 (b) 172000 (c) 184000 (d) 166000 (e) 164000

Practice MCQs for Mains_(Solutions)

1. **(d):** Let the total no. of students in 2015 and 2017 be $4x$ and $5x$ respectively.
 Given $\left(4x \times \frac{40}{100} - 5x \times \frac{30}{100}\right) = 0.1x = 180$
 $x=1800$
 then no. of banking students in 2017 = $9000 \times \frac{36}{100} = 3240$
 no. of banking students in 2015 = $7200 \times \frac{28}{100} = 2016$
 Difference = $(3240 - 2016) = 1224$
2. **(b):** No. of upsc students in 2015
 $= \left(8000 \times \frac{40}{100}\right) = 3200$
 No. of upsc students in 2016
 $= \left(8000 \times \frac{110}{100} \times \frac{30}{100}\right) = 2640$
 No. of upsc students in 2017 = $\left(8000 \times \frac{110}{100} \times \frac{110}{100} \times \frac{30}{100}\right) = 2904$
 No. of upsc students in 2018 = $\left(8000 \times \frac{110}{100} \times \frac{110}{100} \times \frac{110}{100} \times \frac{1}{4}\right) = 2662$
 As it can be seen that in 2018 the no. of Upsc student was third highest.
3. **(d):** Let total no. of students in 2015, 2016, 2017, 2018 be a, b, c, d respectively
 For 2015,
 no. of Upsc students = $a \times \frac{40}{100} = 0.4a$
 average of Banking and SSC students = $\frac{0.28a + 0.32a}{2} = 0.3a$
 For 2016,
 no. of Upsc students = $a \times \frac{30}{100} = 0.3a$
 average of Banking and SSC students = $\frac{0.42a + 0.28a}{2} = 0.35a$
 For 2017,
 no. of Upsc students = $a \times \frac{30}{100} = 0.3a$
 average of Banking and SSC students = $\frac{0.36a + 0.34a}{2} = 0.35a$
 For 2018
 no. of Upsc students = $a \times \frac{25}{100} = 0.25a$
 average of Banking and SSC students = $\frac{0.30 + 0.45a}{2} = 0.375a$
 So there is one year i.e. 2015 in which no. of Upsc students is more than average of Banking and SSC students together.
4. **(c):** Let the total no. of students be x for all of the given year, then
 For 2015
 Difference between upsc and SSC students = $(0.4x - 0.32x) = 0.08x$
 For 2016
 Difference between upsc and SSC students = $(0.30x - 0.28x) = 0.02x$
 For 2017
 Difference between upsc and SSC students = $(0.34x - 0.30x) = 0.04x$
 For 2018
 Difference between upsc and SSC students = $(0.45x - 0.25x) = 0.20x$
 As it can be seen that difference between no. of upsc students and SSC students is second lowest is in 2017.
5. **(e):** Let the total no. of students in 2018 be x
 Then ATQ
 $(.45x - .30x) = 300$
 $X = 2000$ and no. of upsc students in 2018 = 500
 So no. of upsc students in 2015 and 2017 will be 600 and 300 respectively
 So no. of SSC students in 2015 = $\left(\frac{600}{40} \times 32\right) = 480$
 no. of SSC students in 2017 = $\left(\frac{300}{30} \times 34\right) = 340$
 average no. of SSC students in 2015 and 2017 together = $\frac{480 + 340}{2} = 410$
6. **(d):** Required ratio = $\frac{4000 + 3600 + 1400}{(1800 - 1000) + (2800 - 800)} = \frac{9000}{800 + 2000} = \frac{9000}{2800} = \frac{45}{14}$
7. **(a):** Total number of female employees who are in HR & Tech department = $1600 + 800 = 2400$
 Total male employees who are in Marketing and Finance = $(3600 - 2000) + (1400 - 1000) = 1600 + 400 = 2000$
 Required difference = $2400 - 2000 = 400$
8. **(c):** Total male employees who are in HR and Tech department together = $(4000 - 1600) + (2800 - 800) = 2400 + 2000 = 4400$
 Total female employees in Production and Finance department together = $1000 + 1000 = 2000$
 Required % = $\frac{4400 - 2000}{2000} \times 100 = 120\%$

9. (b): Total employees (male + female) who left the company from Production department

$$= \left((1800 - 1000) \times \frac{15}{100} \right) + \left(1000 \times \frac{18}{100} \right)$$

$$= 120 + 180$$

$$= 300$$
Required % = $\frac{300}{1400} \times 100$

$$= 21\frac{3}{7}\%$$

10. (b): ATQ,

$$\text{Required average} = \frac{1}{3} [(4000-1600) + (1400-1000) + (2800-800)]$$

$$= \frac{1}{3} (2400 + 400 + 2000)$$

$$= 1600$$

Sol (11-15):

Year	A			B		
	Soaps manufactured	Soaps sold	Unsold soaps	Soaps manufactured	Soaps sold	Unsold soaps
2014	5000	4000	1000	8000	6000	2000
2015	7000	6000	2000	3000	4500	500
2016	4000	5400	600	7000	6000	1500
2017	6000	6270	330	6500	7200	800
2018	8000	5831	2499	5000	4930	870

11. (a): Soaps sold by A & B together in 2016 = 5400 + 6000

$$= 11400$$
Unsold soaps of B in 2014 & 2016 together = 2000 + 1500

$$= 3500$$
Required % = $\frac{11400}{3500} \times 100$

$$= 325\frac{5}{7}\%$$
12. (d): Average of unsold units of B in all 5 years

$$= \frac{(2000+500+1500+800+870)}{5}$$

$$= 1134$$
Unsold units of A in 2016 & 2017 together = 600 + 330 = 930
Required difference = 1134 - 930 = 204
13. (b): Soaps manufactured by A in 2019 = $\frac{125}{100} \times 8000$

$$= 10,000$$
Soaps manufactured by B in 2019 = $\frac{70}{100} \times 5000$

$$= 3,500$$
Soaps sold by A in 2019 = $\frac{130}{100} \times 6000 = 7,800$
Soaps sold by B in 2019 = $\frac{180}{100} \times 1500 = 2,700$
Required % = $\frac{7800+2700}{10000+3500} \times 100 = 77\frac{7}{9}\%$
14. (b): Revenue of A in 2016, 2017 & 2018 together

$$= (5400 + 6270 + 5831) \times 13$$

$$= \text{Rs.} 2,27,513$$
Revenue of B in 2015, 2016 & 2017 together

$$= (4500 + 6000 + 7200) \times 17$$

$$= \text{Rs.} 3,00,900$$
Required difference = 3,00,900 - 2,27,513

$$= \text{Rs.} 73,387$$

15. (e): Total cost incurred by B in manufacturing soaps over all the given years

$$= (8000 + 3000 + 7000 + 6500 + 5000) \times 15$$

$$= \text{Rs.} 4,42,500$$
Total revenue of B from selling soaps over all the given years

$$= (6000 + 4500 + 6000 + 7200 + 4930) \times 15.80$$

$$= \text{Rs.} 4,52,354$$
Required % = $\frac{(4,52,354 - 4,42,500)}{4,42,500} \times 100$

$$= 2.23\%$$

$$= 2\% \text{ (approx.)}$$

16. (d): Let total students participated in exam P & Q be 'x' & 'y' respectively.

ATQ -

$$x \times \frac{40}{100} \times \frac{75}{100} = 900$$

$$\frac{3x}{10} = 900$$

$$x = 3000$$

$$\text{Also, } y \times \frac{40}{100} \times \frac{(100-36)}{100} = 640$$

$$y = 2500$$

$$\text{Required ratio} = \frac{2500}{3000} = 5 : 6$$

17. (e): Let total students participated in exam from Q = a

ATQ -

$$a \times \frac{60}{100} \times \frac{60}{100} = 1440$$

$$a = 4000$$

$$\text{Total girls failed from Q} = 4000 \times \frac{40}{100} \times \frac{40}{100} = 640$$

Let total students participated in exam from R = b
 So,

$$b \times \frac{45}{100} \times \frac{58}{100} - b \times \frac{55}{100} \times \frac{30}{100} = 192$$

$$b = 2000$$

$$\text{Total girls failed from R} = 2000 \times \frac{45}{100} \times \frac{42}{100} = 378$$

$$\text{Required difference} = 640 - 378 = 262$$

18. (a): Let total number of students participated from S = p

ATQ -

$$p \times \frac{45}{100} \times \frac{50}{100} = 1125$$

$$p = 5000$$

Given, ratio of total failed boys to total failed girls = 7 : 3

$$\text{Required difference} = 5000 \times \frac{55}{100} \times \left(\frac{7}{10} - \frac{3}{10} \right) = 1100$$

19. (b): Let total students participated in exam from P = x

$$x \times \frac{40}{100} \times \left(\frac{75}{100} - \frac{25}{100} \right) = 600$$

$$\frac{x}{5} = 600$$

$$x = 3000$$

Let total students participated in exam from S = y

$$y \times \frac{45}{100} \times \frac{50}{100} = 1350$$

$$y = 6000$$

$$\text{Total failed students from S} = 6000 \times \frac{55}{100} = 3300$$

$$\text{Required percentage} = \frac{3300 - 3000}{3000} \times 100$$

$$= \frac{300}{3000} \times 100 = 10\%$$

20. (c): Let total students participated from P be '2x'

So, total students participated from R = 3x

$$3x \times \frac{55}{100} \times \frac{(100-30)}{100} - 2x \times \frac{40}{100} \times \frac{(100-25)}{100} = 2220$$

$$1.155x - 0.60x = 2220$$

$$x = 4000$$

$$\text{Total girls passed from P \& R} = 8000 \times \frac{40}{100} \times \frac{25}{100} +$$

$$12000 \times \frac{55}{100} \times \frac{30}{100}$$

$$= 800 + 1980 = 2780$$

$$\text{Required average} = \frac{2780}{2} = 1390$$

21. (c): Buying price of first share of RIL

$$= 50000 \times \frac{120}{100} = \text{Rs } 60000$$

Buying price of second share of RIL

$$= 50000 \times \frac{120}{100} \times \frac{115}{100}$$

$$= \text{Rs } 69000$$

$$\text{Selling price of both shares of RIL} = 2 \times \left(50000 \times \right.$$

$$\left. \frac{110}{100} \times \frac{120}{100} \times \frac{130}{100} \right)$$

$$= \text{Rs } 171600$$

$$\text{Required profit} = 171600 - (69000 + 60000)$$

$$= \text{Rs } 42600$$

22. (a): Buying price of one share of RIL in March

$$= 50000 \times \frac{120}{100} \times \frac{115}{100}$$

$$= \text{Rs } 69000$$

Selling price of one share of RIL in May

$$= 50000 \times \frac{110}{100} \times \frac{120}{100} \times \frac{130}{100} \times \frac{110}{100} = \text{Rs } 94380$$

$$\text{Profit earned by Deepak} = \left(10 \times \frac{3}{5} \times 94380 \right) -$$

$$\left(10 \times \frac{3}{5} \times 69000 \right)$$

$$= 566280 - 414000 = \text{Rs } 152280$$

$$\text{Profit earned by Mohit} = \left(10 \times \frac{2}{5} \times 94380 \right) -$$

$$\left(10 \times \frac{2}{5} \times 69000 \right)$$

$$= 377520 - 276000$$

$$= \text{Rs } 101520$$

$$\text{Required difference} = 152280 - 101520$$

$$= \text{Rs } 50760$$

23. (b): Selling price of 1 share of RIL in April =

$$50000 \times \frac{110}{100} \times \frac{120}{100} \times \frac{130}{100}$$

$$= \text{Rs } 85800$$

Buying price of 1 share of RIL in March =

$$50000 \times \frac{120}{100} \times \frac{115}{100}$$

$$= \text{Rs } 69000$$

$$\text{Required \%} = \frac{85800 - 69000}{69000} \times 100$$

$$= \frac{16800}{69000} \times 100$$

$$= 24 \frac{8}{23} \%$$

24. (c): Selling price of 1 share of RIL in April =

$$50000 \times \frac{110}{100} \times \frac{120}{100} \times \frac{130}{100}$$

$$= \text{Rs } 85800$$

Buying price of 1 share of RIL in March =

$$50000 \times \frac{120}{100} \times \frac{115}{100}$$

$$= \text{Rs } 69000$$

$$\text{Required ratio} = \frac{85800}{69000}$$

$$= 143 : 115$$

25. (d): Let X and Y be the incomes of A in 2000 and 2002 respectively.

$$\text{Profit in 2000} = 0.1X$$

$$\text{Income} - \text{Expenditure} = \text{Profit}$$

For 2000,

$$X - 9,00,000 = 0.1X$$

$$\text{Thus, } X = 10 \text{ lakhs}$$

For 2002,

$$Y - 10,20,000 = 0.15Y$$

$$\text{Thus, } Y = 12 \text{ lakhs}$$

$$\text{The profit of A in 2000} = \text{Rs. } 1 \text{ lakh}$$

$$\text{The profit of A in 2002} = \text{Rs. } 1.8 \text{ lakhs}$$

$$\text{The difference between these quantities} = \text{Rs } 80,000$$

26. (b): For B in 2004, the value of profit = 20%.

For C in 2000, the value of profit = 20%.

Since the expenditure is same in both cases and the value of profit is also the same in both cases, the incomes will also be equal in the two cases.

Hence required ratio = 1 : 1

27. (a): Let the income of A and B in 2008 be Rs 5x and 4x respectively.

$$\text{Profit of A in 2008} = \text{Rs } 1x$$

$$\text{Profit of B in 2008} = \text{Rs } 1.2x$$

$$\text{Required ratio} = \frac{4x}{2.8x} = 10 : 7$$

28. (c): From the graph, we can see that the percentage profit for all three companies in 2002 was the same.

So, the ratio of incomes of A to that of (B+C) = 5 : 7.

- 29. (d):** Let the income of C in 2006 be Rs x lakh
Then income of B in 2010 = $(15-x)$ lakhs
ATQ
 $(15-x) \times 0.7 - x \times 0.75 = 1.8$
 $x = 6$ lakhs
Required difference = 3 lakhs
- 30. (d):** no. of visits in January = 15000
no. of visits in May = 30000
required % = $\frac{30000-15000}{15000} \times 100 = 100\%$
- 31. (b):** Required average = $\frac{21000+20000+25000+20000}{4} = \frac{86000}{4} = 21500$
- 32. (a):** no. of visits on Kia motors website in January & March = $25000 + 20000 = 45000$
no. of visits on Honda website in May & June = $25000 + 20000 = 45000$
required difference = $45000 - 45000 = 0$.
- 33. (e):** difference in no. of visits on Tata motors website from May to June
= $30000 - 25000 = 5000$
difference in no. of visits on Kia motors website from January to March
= $25000 - 20000 = 5000$
difference in no. of visits on Honda website from March to May
= $25000 - 20000 = 5000$
difference in no. of visits on Honda website from May to June
= $25000 - 20000 = 5000$.
Clearly, (a), (b) and (c).
- 34. (c):** Total visits on Kia motors website = $25000 + 20000 + 20000 + 25000 = 90000$
average visits on Kia motors website = $\frac{90000}{4} = 22500$
Total visits on Tata motors website = $15000 + 26000 + 30000 + 25000 = 96000$
average no. of visits = $\frac{96000}{4} = 24000$
required % = $\frac{22500}{24000} \times 100 = 93.75\% \approx 94\%$
- 35. (a):** Total no. of students in class = $15 + 45 = 60$
Required percentage = $\frac{(60-15)}{60} \times 100 = 75\%$
- 36. (b):** No. of students who attempted 2 questions = $25 - 15 = 10$
Required percentage = $\frac{12-10}{12} \times 100 = 16\frac{2}{3}\%$ less.
- 37. (d):** No. of students who have attempted 2 questions = $25 - 15 = 10$
No. of students who attempted 1 question = $45 - 25 = 20$

Total students who attempted less than or equal to two questions = $10 + 20 = 30$
No. of students who attempted 3 questions = $15 - 12 = 3$
Required ratio = $30:3 = 10:1$

- 38. (b):** No. of students who attempted 1 question = $45 - 25 = 20$
No. of students who attempted 2 questions = $25 - 15 = 10$
No. of students who attempted 3 questions = $15 - 12 = 3$
No. of students who attempted 4 questions = $12 - 4 = 8$
No. of students who attempted equal to 5 questions = 4
Total no. of students who marked right answer = $45 \times \frac{40}{100} = 18$
Total students who have attempted 1 question and marked right = $18 - 10 \times \frac{40}{100} - 3 \times \frac{1}{3} - 8 \times \frac{75}{100}$
 $= 18 - 4 - 1 - 6 = 7$
Now, to get minimum no. of students who attempted 1 question and marked wrong answer, all students who attempted 5 questions must mark right i.e. 4 students attempted 5 questions and marked right.
So Number of students who attempted 1 question and marked right = $7 - 4 = 3$
Required students who attempted 1 question and marked wrong = $20 - 3 = 17$

- 39. (d):** No. of students who attempted 4 questions = $12 - 4 = 8$
No. of students who attempted equal to 5 questions = 4
Total no. of students who attempted more than 3 questions = $8 + 4 = 12$
Required percentage = $\frac{15}{12} \times 100 = 125\%$
- 40. (e):** Let the number of girls present in DPS, KV and DAV be $300x$, $400x$ and $300x$ respectively
required ratio = $\frac{400x}{80} \times 100 : \frac{300x}{90} \times 100 : \frac{300x}{75} \times 100 = 15 : 10 : 12$
- 41. (c):** Let the number of girls present in KV be $100x$.
Then, boys present in KV = $80x$.
Number of girls in KV = $\frac{100x}{80} \times 100 = 125x$
Let number of girls and boys in DPS be $100y$ and $100z$ respectively
ATQ,

$$100y + 100z = 125x \times 1.6 = 200x \quad \dots (i)$$

$$\text{And, } 80z + 75y = 180x \times \frac{775}{900} = 155x \quad \dots (ii)$$

From (i) and (ii)

$$z = x$$

$$\text{Required}\% = \frac{80x}{100x} \times 100 = 80\%$$

- 42. (b);** Let number of boys in DPS and DAV be $100x$ and $100y$ respectively

$$\text{ATQ, } 80x + 80y = 920$$

$$\Rightarrow x + y = 11.5$$

Total boys in these two schools

$$\Rightarrow 100x + 100y = 1150.$$

Maximum number of boys in DPS

$$= 1150 - 5 = 1145$$

(number of boys in DAV = 5 so that boys present can have integral value i.e. $\frac{80}{100} \times 5 = 4$)

$$\text{Maximum number of boys not present} = 1145 \times \frac{20}{100} = 229$$

- 43. (c);** Number of boys in DAV = $\frac{440}{80} \times 100 = 550$

$$\text{Number of girls in DAV} = \frac{550}{110} \times 100 = 500$$

$$\text{Number of girls present in DAV} = 500 \times \frac{90}{100} = 450$$

$$\text{Number of girls present in DPS} = 450 \times 2 - 450 = 450$$

Required difference

$$= (440 + 450) - \frac{450}{75} \times 100 = 890 - 600 = 290$$

- 44. (a);** Production of wheat in state B in 2001

$$\frac{20}{100} \times 100 \times \frac{115}{100} \times \frac{120}{100}$$

$$= 27.6 \text{ thousand kg}$$

Production of wheat in state C in 2001

$$= 27.6 \times \frac{100}{60}$$

$$= 46 \text{ thousand kg}$$

- 45. (b);** Production of wheat in the country in 2002

$$= 100 \times \frac{110}{100} \times \frac{115}{100} \times \frac{95}{100}$$

$$= 120.175 \text{ thousand kg}$$

$$\text{Req}\% = \frac{23}{120.175} \times 100 = 19.13\% \approx 19\%$$

- 46. (c);** Amount of production of state B in 2003

$$= 20 \times 1.15 \times 1.2 \times 1.2 \times 0.9$$

$$= 29.808 \text{ thousand kg}$$

Amount of production of the Country in 2003

$$= 100 \times 1.1 \times 1.15 \times 0.95 \times 1.05$$

$$= 126.18375 \text{ kg}$$

$$\text{Difference} = 126.18375 - 29.808$$

$$= 96.37575 \text{ thousand kg}$$

$$= 96375.75 \text{ kg}$$

- 47. (d);** Req. Ratio = $\frac{20 \times \frac{120}{100} \times \frac{115}{100}}{100 \times \frac{110}{100} \times \frac{115}{100} \times \frac{95}{100}} = \frac{20 \times 120}{110 \times 95} = \frac{48}{209}$

- 48. (b);** Production of wheat in state B in 2002 = $20 \times 1.15 \times 1.2 \times 1.2 = 33.12\%$

Production of wheat in country A in 2001

$$= 100 \times 1.1 \times 1.15 = 126.5\%$$

Required production

$$= \frac{165600}{33.12} \times 126.5 = 632500 \text{ kg}$$

- 49. (e);** Let total no. of Urban people travelled in the given year = x

$$\therefore \frac{20x}{100} = \frac{26}{100} \times 275$$

$$x = 357.5 \text{ lakh}$$

$$\therefore \text{Required average} = \frac{357.5}{4}$$

$$= 89.375 \text{ lakhs}$$

- 50. (d);** Required ratio = $\left[\frac{(28+46)}{100} \times 275 \right] : \left[\frac{(42+28)}{100} \times 350 \right]$
 $= 20350 : 24500$
 $= 407 : 490$

- 51. (b);** Rural people travelled in 3rd quarter = $\frac{28}{100} \times 350$
 $= 98 \text{ lakh}$

Let total no. of rural people travelled in the year = x

$$\therefore 98 = \frac{14}{100} \times x$$

$$x = \frac{98000}{14} = 700 \text{ lakhs}$$

$$\therefore \text{No. of rural people travelled in 4th quarter} = (700 - 350) = 350 \text{ lakhs}$$

- 52. (b);** Urban people travelled in IInd quarter = $\frac{26}{100} \times 275$
 $= 71.5 \text{ lakh}$

Urban people travelled in IVth quarter = $(71.5 - 45)$

$$= 26.5 \text{ lakh}$$

Total no. of urban people travelled in the given year

$$= 275 + 26.5 = 301.5 \text{ lakhs}$$

$$\therefore \text{Required \%} = \frac{26.5}{301.5} \times 100 = 8.79\% \approx 9\%$$

- 53. (b);** Average no. of urban people travelled in Ist and 2nd quarter = $\left(\frac{28+26}{100} \right) \times 275 \times \frac{1}{2}$
 $= 74.25 \text{ lakhs}$

No. of rural people travelled in Ist quarter

$$= \frac{30}{100} \times 350 = 105 \text{ lakh}$$

$$\text{Required \%} = \frac{105 - 74.25}{105} \times 100 = 29\frac{2}{7}\%$$

- 54. (a);** If growth rate = 10%

Let total amount of production in 2000 be x

The total amount of production in 2001 = $1.1x$

Total amount of production in 2002 = $1.21x$

Total amount of production in 2003 = $1.331x$

A.T.Q

$$\frac{1}{5} \times 1.331x - \frac{23}{100} \times 1.1x = 1320 \text{ MT}$$

$$\Rightarrow x = 1,00,000 \text{ MT}$$

Now, Amount of production in 2003 if growth rate is 25%

$$= 100,000 \times (1.25)^3$$

$$= 195312.5 \text{ MT}$$

$$\text{Required difference} = \frac{(30-20)}{100} \times 195312.5$$

$$= 19531.25 \text{ MT}$$

55. (c); A.T.Q.

$$\frac{40}{100} \times 1.331x - \frac{23}{100} \times 1.1x = 4191 \text{ MT}$$

$$\Rightarrow x = 15,000 \text{ MT}$$

Total amount of production in 2003 for growth rate 10%

$$= 15000 \times 1.331$$

$$= 19965 \text{ MT}$$

$$\text{Req. Difference} = \frac{(30-20)}{100} \times 19965 = 1996.5 \text{ MT}$$

56. (a); Total amount of production in 2002 = 1.21x

$$= 1.21 \times 100000$$

$$= 121000 \text{ MT}$$

Amount of production of D in 2002

$$= \frac{20}{100} \times 121000 = 24200 \text{ MT}$$

$$\text{Sales revenue contributed by D} = 24200 \times 150$$

$$= 3630000$$

57. (a); We need to consider values of total production for D and B only as A and C can be eliminated by observation

By further observation we can make out that B's production is fairly high as compared to D

58. (a); Production of C in 2000 = $\frac{20}{100} \times 100,000$

$$= 20000 \text{ MT}$$

$$\text{Production of C in 2002} = \frac{30}{100} \times 1.21 \times 100000$$

$$= 36300 \text{ MT}$$

$$\% \text{ increase} = \frac{(36300-20000)}{20000} \times 100$$

$$= 81.5\%$$

59. (c); Let, Samsung Phone sold in 2012 = 100X

Then, MI phones sold in 2012 = 80X

Given, total MI phones sold in 2014

$$= 80X \times 1.15 \times 1.1 = 101.2X$$

$$101.2X = 708400$$

$$X = 7000$$

Total Samsung mobile sold in 2015

$$= 100X \times 1.05 \times 1.1 \times 0.95 \Rightarrow = 109.725X$$

$$= 109.725 \times 7000 = 768075$$

60. (a); Let, Samsung Phone sold in 2012 = 100X

In Actual,

$$\text{Sold Samsung} \times \frac{85}{100} - \text{Sold MI} \times \frac{90}{100} = 13000$$

$$= 100X \times \frac{85}{100} - 80X \times \frac{90}{100} = 13000$$

$$= 85X - 72X = 13000$$

$$X = 1000$$

Number of MI phone sold in 2013 in actual

$$= 72 \times 1.15 \times 1000 \Rightarrow = 82,800$$

61. (b); Total MI phones sold in 2013 = 80X × 1.15 = 92X

Total Samsung phone sold in 2014

$$= 100X \times 1.05 \times 1.1 = 115.5X$$

$$\text{Required}\% = \frac{92X}{115.5X} \times 100 \Rightarrow = 79\frac{151}{231}\%$$

62. (d); Actual MI phone sold in 2013

$$= 80X \times 1.15 \times \frac{3}{4} \Rightarrow = 69X$$

Total Samsung phone sold in 2016

$$= 100X \times 1.05 \times 1.1 \times 0.95 \times 1.2$$

$$= 131.67X$$

$$\text{Required ratio} = \frac{69X}{131.67X} = 2300 : 4389$$

63. (a); Let Samsung mobile in year 2012 = 100x

$$\therefore 100x - 80x = 5000 \Rightarrow x = 250$$

Samsung phone sold in 2013

$$= 100X - 80X = 5000 \Rightarrow = 20 \times 25000$$

$$= 250 \times (100 \times 1.05) \Rightarrow = 26250$$

Selling price of each Samsung phone

$$= \frac{2100000}{26250} = 8\$$$

Selling price of each MI phone

$$= 8 \times \frac{100}{125} = 6.4\$$$

64. (c); Number of defective fans found during testing in

$$\text{March} = \frac{5600}{20} = 280$$

Total number of defective fans in that month =

$$\frac{280}{70} \times 100 = 400$$

$$\text{Required \%} = \frac{400}{2400} \times 100 = 16\frac{2}{3}\%$$

65. (b); Option I

$$\text{Extra cost} = 1600 \times 2.5 + 150 \times \frac{70}{100} \times 20 +$$

$$\frac{150 \times 30}{100} \times 60$$

$$= \text{Rs } (4000 + 2100 + 2700) = \text{Rs } 8800$$

Option II

$$\text{Extra cost} = 1600 \times 4 + 150 \times \frac{90}{100} \times 20 +$$

$$\frac{150 \times 10}{100} \times 60$$

$$= \text{Rs } 10000$$

$$\text{Required difference} = 1200$$

66. (d); Let number of all defective units in January and April be x and y respectively.

Atq,

$$y \times \frac{90}{100} \times 20 - \frac{x \times 70}{100} \times 20 = 5300$$

$$\Rightarrow 18y - 14x = 5300 \quad \dots(i)$$

And,

$$\frac{x \times 30}{100} \times 60 - \frac{y \times 10}{100} \times 60 = 900$$

$$\Rightarrow 18x - 6y = 900 \quad \dots(ii)$$

From (i) & (ii)

$$X = 200 \text{ and } y = 450$$

$$\text{Required ratio} = \frac{200}{450} = 4 : 9$$

67. (b); Number of defective items sold to the customer

$$= \frac{1620}{60} = 27$$

Number of all defective units in may

$$= \frac{27}{10} \times 100 = 270$$

$$\text{Total manufactured units} = \frac{270 \times 7}{180} \times 100 = 1050$$

68. (e); Number of defective fans during testing in April

$$= \frac{4200}{20} = 210$$

Total number of defective fans in month of April

$$= \frac{210}{70} \times 100 = 300$$

Defective units Identified from side of Customer

$$= 300 - 210 = 90$$

So, Total penalty cost = $90 \times 60 = 5400$ Rs.

69. (b); In city A

$$\text{Required difference} = 35\% - 30\% \rightarrow 5\%$$

$$\Rightarrow 5\% \rightarrow 51$$

$$\Rightarrow 100\% \rightarrow 1020$$

In city B

$$\text{Required average} = \frac{30+30}{2}\% = \frac{60}{2}\% = 30\% \rightarrow$$

$$765$$

$$\Rightarrow 30\% \rightarrow 765$$

$$\Rightarrow 100\% \rightarrow 2550$$

$$\text{Required ratio} = \frac{1020}{2550} = \frac{2}{5}$$

70. (e); Let number of person in city C = x

Let number of person in city D = 3x

$$\text{Required difference} = \frac{20}{100} \times 3x - \frac{25}{100} \times x = 588$$

$$= 0.6x - 0.25x = 588$$

$$\Rightarrow x = \frac{588}{0.35} = 1680$$

$$\text{Total number of person in city D} = 1680 \times 3 = 5040$$

71. (d); Required difference = $(40 + 35)\% - (35 + 25)\% \rightarrow 240$

$$\Rightarrow 15\% \rightarrow 240$$

Number of person who likes Apple in city E

$$= 40\% \rightarrow \frac{240}{15} \times 40 = 640$$

72. (b); Let,

number of person in city D = x

and, number of person in city E = y

ATQ,

$$0.35x - 0.35y = 2100 \quad \dots(i)$$

And,

$$0.45x + 0.25y = 4100 \quad \dots(ii)$$

On solving (i) & (ii)

$$x = 8000, y = 2000$$

$$\text{Required \%} = \frac{8000-2000}{2000} \times 100$$

$$= \frac{6000}{2000} \times 100 = 300\%$$

73. (c); Let, number of person in city A = 2x

\Rightarrow number of person in city B = 3x

ATQ,

$$0.35 \times 2x + 0.3 \times 3x = 816$$

$$0.7x + 0.9x = 816$$

$$\Rightarrow x = 510$$

Total number of person in city B = 3×510

$$= 1530$$

74. (e); Let he prepared 300 x kg Laddu on Saturday, then

Laddu's sold on Saturday = 225x

Laddu's prepared on Sunday = 500x

Laddu's sold on Sunday = 400x

Barfi's prepared on Saturday and Sunday each

$$= \frac{500x+300x}{2} = 400x$$

Barfi's sold on Saturday = 280x

Barfi's sold on Sunday = 320x

ATQ,

$$(400x + 225x) - (280x + 320x) = 100 \text{ kg}$$

$$\Rightarrow 25x = 100$$

$$x = 4$$

therefore, his Laddu's remained unsold on Sunday = $100x = 400$ kg.

75. (a); Let Laddu's prepared on Friday be 100x

Then Laddu's sold on Friday be 80x

Also

Laddu's prepared on Monday be 100y

Then Laddu's sold on Monday be 90y

ATQ,

$$\frac{100x+90y}{100x+100y} = \frac{113}{120}$$

$$\Rightarrow \frac{x}{y} = \frac{5}{7} \dots(i)$$

And

$$90y \times 20 - 80x \times 20 = 11040$$

$$1800y - 1600x = 11040$$

$$90y - 80x = 552 \dots(ii)$$

On solving (i) and (ii) we will get

$$y = 16.8$$

$$100y = 1680 \text{ kg.}$$

76. (c); Let Barfi prepared on Friday be = 100a

Laddu prepared on Friday = $100a + 80$

Let Barfi prepared on Monday = 100b

ATQ,

$$\frac{80}{100} [100a + 80] = 60b$$

$$100a + 80 = 75b$$

$$15b - 20a = 16 \dots(i)$$

Also,

$$\frac{100b}{100a} = \frac{10}{7} \Rightarrow 7b = 10a \text{ or } 14b = 20a$$

From (i)

$$b = 16$$

or

$$a = 11.2$$

Therefore, Barfi prepared on Friday = 1120 kg

- 77. (a);** Let he prepared 500x kg of Laddu & 400x kg of Barfi on Saturday.

Quantity of Barfi sold = 280x kg

$$\text{Profit from Barfi} = 280x \times 10 - \frac{120x}{0.8} \times 10$$

$$= 2800x - 1500x = 1300x$$

Quantity of Laddu sold = 375x

$$\text{Profit from Laddu} = 375x \times 10 - \frac{125x}{0.8} \times 10$$

$$= 3750x - 1562.5x$$

$$= 2187.5x$$

Required profit %

$$= \frac{1300x + 2187.5x}{900x \times 200} \times 100$$

$$= \frac{3487.5x}{1800x} = 1.9375 \approx 2\%$$

- 78. (b);** Let he prepared 100a kg of Barfi on each day.

The laddu's prepared = 75a, 125a and 105a.

$$\text{Barfi sold on these 3 days} = 70a + 80a + 60a = 210a$$

Laddu sold on these 3 days

$$= \frac{225}{4}a + 100a + 94.5a$$

$$= 56.25a + 100a + 94.5a$$

$$= 250.75a$$

$$\text{Required \%} = \frac{460.75}{605} \times 100 = 76.15\%$$

- 79. (b);** Total purchasing price of 15 Ripples

$$= 10 \times 240 + 240 \times \frac{110}{100} \times 5$$

$$= 2400 + 1320$$

$$= 3720 \text{ Rs}$$

Total selling price of 15 Ripple

$$= 280 \times \frac{95}{100} \times \frac{120}{100} \times \frac{120}{100} \times 15$$

$$= 5745.6 \text{ Rs}$$

$$\text{Profit} = 5745.6 - 3720 = 2025.6 \text{ Rs}$$

- 80. (c);** Total purchasing price of 45 Ripple in month of February

$$= 240 \times \frac{110}{100} \times 45$$

$$= 11880 \text{ Rs}$$

Total selling price of 45 Ripple in month of April

$$= 280 \times \frac{95}{100} \times \frac{120}{100} \times \frac{120}{100} \times 45$$

$$= 17236.8 \text{ Rs}$$

$$\text{Total profit} = 17236.8 - 11880$$

$$= 5356.8$$

$$\text{Divyaraj Share} = 5356.8 \times \frac{2}{3}$$

$$= 3571.2 \text{ Rs}$$

- 81. (e);** Purchasing price of one Ripple in month of march

$$= 240 \times \frac{110}{100} \times \frac{75}{100}$$

$$= 198 \text{ Rs}$$

Selling price of one Ripple in month of April

$$= 280 \times \frac{95}{100} \times \frac{120}{100} \times \frac{120}{100}$$

$$= 383.04 \text{ Rs}$$

$$\text{Required \%} = \frac{383.04 - 198}{383.04} \times 100$$

$$= 48.3 \approx 48\%$$

- 82. (a);** Required ratio = $\frac{240 \times \frac{110}{100} \times \frac{75}{100} \times \frac{80}{100}}{280 \times \frac{95}{100} \times \frac{120}{100} \times \frac{120}{100}}$

$$= \frac{158.4}{383.04} = 1955 : 4788$$

- 83. (c);** Required % = $\frac{240 \times \frac{110}{100} \times \frac{75}{100} \times \frac{80}{100} \times \frac{115}{100}}{280 \times \frac{95}{100} \times \frac{120}{100}} \times 100$

$$= \frac{182.16}{319.2} \times 100$$

$$= 57.06 \approx 57\%$$

- 84. (d);** Let Production of Rice in base year 2011 = 100x
And Production of Wheat in base year 2011 = 75x

∴ ATQ,

$$100x \times \frac{(100+10)}{100} = 440$$

$$\Rightarrow x \times 110 = 440$$

$$\Rightarrow x = 4$$

Production of Wheat in 2011 = 75 × 4 = 300 quintal

$$\Rightarrow \text{Production of Wheat in 2013} = 300 \times \frac{(100-5)}{100}$$

$$= 3 \times 95$$

$$= 285 \text{ quintals}$$

- 85. (c);** Let Production of Rice and Wheat in 2011 be 100x and 75x respectively

Average production of Wheat in 2016 & 2017 together

$$= \frac{1}{2} \left[75x \times \frac{105}{100} + 75x \times \frac{115}{100} \right]$$

$$= \frac{1}{2} \times 75x \times \frac{220}{100} = 82.5x$$

Average production of rice in 2016 & 2017 together

$$= \frac{1}{2} \left[100x \times \frac{110}{100} + 100x \times \frac{85}{100} \right]$$

$$= \frac{1}{2} \times 100x \times \frac{195}{100} = 97.5x$$

$$\text{Required percent} = \frac{82.5x}{97.5x} \times 100 = 84 \frac{8}{13} \%$$

- 86. (a);** Let Production of Rice and Wheat in 2011 be 100x and 75x respectively.

$$\text{Production of Wheat in 2014} = 75x \times \frac{120}{100} = 90x$$

$$\text{Production of Rice in 2013} = 100x \times \frac{110}{100} = 110x$$

$$\text{Required percentage} = \frac{110x - 90x}{110x} \times 100 = \frac{20x}{110x} \times 100 = 18 \frac{2}{11} \%$$

- 87. (e);** Let Rice produced in 2011 = $100x$
 \Rightarrow Wheat produced in 2011 = $75x$
 \Rightarrow Wheat produced in 2013 = 285
 $\Rightarrow 75x \times \frac{95}{100} = 285$
 $\Rightarrow x = 4$
 Rice produced in 2014 & 2015 together
 $= 100 \times 4 \times \left[\frac{110}{100}\right] + 100 \times 4 \times \left[\frac{95}{100}\right]$
 $= 400 \times \frac{205}{100} = 820$ quintal
 Wheat produced in 2016 & 2017 together
 $= 75 \times 4 \times \frac{105}{100} + 75 \times 4 \times \frac{115}{100}$
 $= 75 \times 4 \times \frac{220}{100} = 660$ quintal
 Required difference = $820 - 660 = 160$ quintal.
- 88. (b);** Let production of Rice and Wheat in 2011 be $100x$ and $75x$ respectively.
 Required ratio = $\frac{100x(110+110+110+95+110+85)}{75x(115+95+120+90+105+115)}$
 $= \frac{110x \times 620}{75x \times 640} = 31:24$
- 89. (d);** Let total movies broadcast by five different channels be $100x$ and let total Bollywood movies broadcast by these five channels be $100y$.
 ATQ,
 $\left(\frac{28}{100} \times 100x - \frac{25}{100} \times 100y\right) - \left(\frac{20}{100} \times 100x - \frac{15}{100} \times 100y\right) = 170$
 $28x - 25y - 20x + 15y = 170$
 $8x - 10y = 170 \quad \dots(i)$
 And, $\left(\frac{12}{100} \times 100x - \frac{10}{100} \times 100y\right) + \left(\frac{16}{100} \times 100x - \frac{20}{100} \times 100y\right) = 670$
 $12x - 10y + 16x - 20y = 670$
 $28x - 30y = 670 \quad \dots(ii)$
 On solving (i) & (ii), we get:
 $x = 40, y = 15$
 Total number of number Bollywood movies broadcast by E = $\frac{30}{100} \times 100 \times 15 = 450$

- 90. (e);** Let total movies broadcast by five different channels be $100x$ and let total Bollywood movies broadcast by these five channels be $100y$.
 ATQ,
 $\left(\frac{20+16}{100} \times 100x\right) - \left(\frac{10+30}{100} \times 100y\right) = 1200$
 $36x - 40y = 1200 \quad \dots(i)$
 Now, total Hollywood movies broadcast by E =
 $\left(\frac{24}{100} \times 100x - \frac{30}{100} \times 100y\right)$
 $= 24x - 30y$
 Now, $\frac{24x-30y}{\frac{20}{100} \times 100x} = \frac{30}{100}$
 $\frac{24x-30y}{20x} = \frac{3}{10}$

$18x = 30y$
 $y = 0.6x \quad \dots(ii)$
 On solving (i) & (ii), we get:
 $x = 100, y = 60$
 Total Bollywood movies broadcast by all five channels = $100 \times 60 = 6000$

- 91. (b);** Let total movies broadcast by five different channels be $100x$ and let total Bollywood movies broadcast by these five channels be $100y$.
 So, Bollywood movies broadcast by E = $100y \times \frac{30}{100} = 30y$
 And, total movies broadcast by A = $100x \times \frac{28}{100} = 28x$
 ATQ,
 $\frac{30y}{28x} = \frac{300}{700}$
 $x = 2.5y$
 Now, total Hollywood movies broadcast by B =
 $\left(\frac{12}{100} \times 100x\right) - \left(\frac{10}{100} \times 100y\right)$
 $= 12x - 10y$
 $= 30y - 10y \quad (x = 2.5y)$
 $= 20y$
 And, total Hollywood movies broadcast by A
 $= \left(\frac{28}{100} \times 100x\right) - \left(\frac{25}{100} \times 100y\right)$
 $= 28x - 25y$
 $= 70y - 25y \quad (x = 2.5y)$
 $= 45y$
 Given, $(45y - 20y) = 750$
 $y = 30$
 And, $x = 75$
 Total Hollywood movies broadcast by E = $\left(\frac{24}{100} \times 100 \times 75\right) - \left(\frac{30}{100} \times 100 \times 30\right)$
 $= 1800 - 900 = 900$
- 92. (d);** Let total movies broadcast by five different channels be $100x$ and let total Bollywood movies broadcast by these five channels be $100y$.
 So, total Hollywood movies broadcast by A and C together
 $= \left(\frac{28}{100} \times 100x - \frac{25}{100} \times 100y\right) + \left(\frac{20}{100} \times 100x - \frac{15}{100} \times 100y\right)$
 $= 28x - 25y + 20x - 15y = 48x - 40y$
 And, total Bollywood movies broadcast by A and C together = $\frac{25+15}{100} \times 100y = 40y$
 ATQ,
 $\frac{40y}{48x-40y} = \frac{5}{11}$
 $\frac{x}{y} = \frac{8}{3}$

Let x & y be 8a & 3a respectively.

$$\text{Now, } \left(\frac{24}{100} \times 100 \times 8a \right) - \left(\frac{30}{100} \times 100 \times 3a \right) = 510$$

$$a = 5$$

Hence, total Bollywood movies broadcast by the all five channels = $100 \times 3 \times 5 = 1500$

And, total Hollywood movies broadcast by the all five channels = $100 \times 8 \times 5 - 1500 = 2500$

$$\text{Required difference} = 2500 - 1500 = 1000$$

- 93. (e):** Let total movies broadcast by five different channels be 100x and let total Bollywood movies broadcast by these five channels be 100y.

ATQ,

$$\left(\frac{1}{3} \times \frac{(20+16+24)}{100} \times 100x \right) - \left(\frac{1}{3} \times \frac{25+15+20}{100} \times 100y \right) = 200$$

$$20x - 20y = 200$$

$$x - y = 10 \quad \dots(i)$$

Now, total Hollywood movies broadcast by C =

$$\left(100x \times \frac{20}{100} \right) - \left(100y \times \frac{15}{100} \right)$$

$$= 20x - 15y$$

And, total Bollywood movies broadcast by C =

$$\left(100y \times \frac{15}{100} \right) = 15y$$

Now,

$$20x - 15y - 15y = 50$$

$$2x - 3y = 5 \quad \dots(ii)$$

On solving (i) & (ii), we get:

$$x = 25, y = 15$$

So total movies broadcast by all the five channels

$$= 100x = 2500$$

- 94. (d):** Let total laptops manufactured by A & B be 'x' & 'y' respectively.

ATQ -

$$x \times \frac{40}{100} \times \frac{75}{100} = 1800$$

$$\frac{3x}{10} = 1800$$

$$x = 6000$$

$$\text{Also, } y \times \frac{40}{100} \times \frac{(100-36)}{100} = 1280$$

$$y = 5000$$

$$\text{Required ratio} = \frac{5000}{6000} = 5 : 6$$

- 95. (e):** Let total laptops manufactured by B = a

ATQ -

$$a \times \frac{60}{100} \times \frac{60}{100} = 2880$$

$$a = 8000$$

$$\text{Total unsold Dell laptops of B} = 8000 \times \frac{40}{100} \times \frac{40}{100}$$

$$= 1280$$

Let total laptops manufactured by C = b

So,

$$b \times \frac{45}{100} \times \frac{58}{100} - b \times \frac{55}{100} \times \frac{30}{100} = 384$$

$$b = 4000$$

$$\text{Total unsold Dell laptops of C} = 4000 \times \frac{45}{100} \times \frac{(100-42)}{100} = 1044$$

$$\text{Required difference} = 1280 - 1044 = 236$$

- 96. (a):** Let total laptops manufactured by C = p

ATQ -

$$p \times \frac{45}{100} \times \frac{50}{100} = 2250$$

$$p = 10000$$

Given, ratio of total unsold HP laptops to total unsold Dell laptops = 7 : 3

$$\text{Required difference} = 10000 \times \frac{55}{100} \times \left(\frac{7}{10} - \frac{3}{10} \right) = 2200$$

- 97. (b):** Let total laptops manufactured by A = x

$$x \times \frac{40}{100} \times \left(\frac{75}{100} - \frac{25}{100} \right) = 1200$$

$$\frac{x}{5} = 1200$$

$$x = 6000$$

Let total laptops manufactured by D = y

$$y \times \frac{45}{100} \times \frac{50}{100} = 2700$$

$$y = 12000$$

$$\text{Total unsold laptops by D} = 12000 \times \frac{55}{100} = 6600$$

$$\text{Required percentage} = \frac{6600 - 6000}{6000} \times 100 = \frac{600}{6000} \times 100 = 10\%$$

- 98. (b):** Let total 5G users in A = 5a

$$\text{So, total 4G users in A} = 5a \times \frac{160}{100} = 8a$$

$$8a - 5a = 270$$

$$a = 90$$

$$\text{Total 5G users in A} = 5 \times 90 = 450$$

Let total 5G users in B = 4b

$$\text{So, total 4G users in B} = 4b \times \frac{175}{100} = 7b$$

$$7b - 4b = 270$$

$$b = 90$$

$$\text{Total 5G users in B} = 90 \times 4 = 360$$

Let total 5G users in E = 5c

$$\text{So, total 4G users in E} = 5c \times \frac{140}{100} = 7c$$

$$7c - 5c = 240$$

$$c = 120$$

$$\text{Total 5G users in E} = 120 \times 5 = 600$$

$$\text{Average of 5G users in A, B & E} = \frac{450+360+600}{3} = 470$$

Let total 5G users in C = 2x

$$\text{So, total 4G users in C} = 2x \times \frac{150}{100} = 3x$$

$$3x - 2x = 250$$

$$x = 250$$

$$\text{Total 4G users in C} = 250 \times 3 = 750$$

Let total 5G users in D = 5y

$$\text{So, total 4G users in D} = 5y \times \frac{180}{100} = 9y$$

$$9y - 5y = 320$$

$$y = 80$$

$$\text{Total 4G users in D} = 80 \times 9 = 720$$

$$\text{Average number of 4G users in C \& D} = \frac{750+720}{2} = 735$$

$$\text{Required difference} = 735 - 470 = 265$$

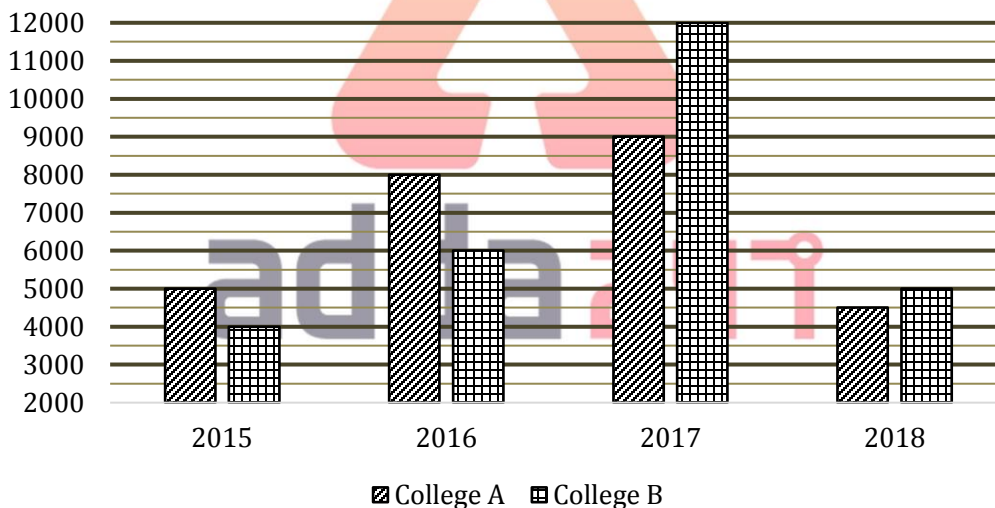
- 99. (a):** Let total 5G users in C = $2x$
 So, total 4G users in C = $2x \times \frac{150}{100} = 3x$
 $3x - 2x = 250$
 $x = 250$
 Total 5G users in C = $250 \times 2 = 500$
 Total 5G users in X = $500 \times \frac{140}{100} = 700$
 Let total 5G users in E = $5c$
 So, total 4G users in E = $5c \times \frac{140}{100} = 7c$
 $7c - 5c = 240$
 $c = 120$
 Total 4G users in E = $120 \times 7 = 840$
 So, total 4G users in X = $840 \times \frac{125}{100} = 1050$

$$\text{Required percentage} = \frac{1050-700}{700} \times 100 = 50\%$$

- 100. (a):** Total 4G users in B = $90 \times 7 = 630$
 Let total 5G users in A = $5a$
 So, total 4G users in A = $5a \times \frac{160}{100} = 8a$
 $8a - 5a = 270$
 $a = 90$
 Total 5G users in A = $5 \times 90 = 450$
 Total 4G users in A = $8 \times 90 = 720$
 Let total 5G users in E = $5c$
 So, total 4G users in E = $5c \times \frac{140}{100} = 7c$
 $7c - 5c = 240$
 $c = 120$
 Total 5G users in E = $120 \times 5 = 600$
 Total 4G users in E = $120 \times 7 = 840$
 Required revenue = $(720 \times 50 + 840 \times 50) + (450 \times 80 + 600 \times 80)$
 $= 78000 + 84000 = 162000$

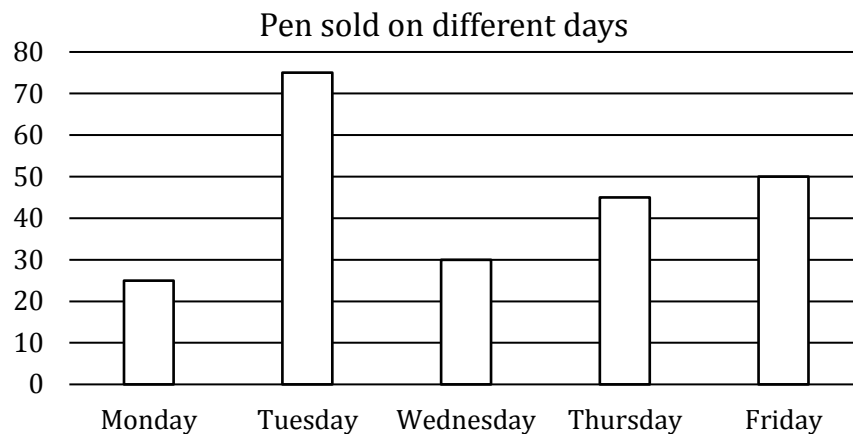
Previous Years' Questions of Prelims

Directions (1-5) :- The Bar graph given below shows the no. of students of two colleges in given years. Study the given graph carefully and answer the following questions.



- What is the average number of students in college A all over the years?
 (a) 5300 (b) 5825 (c) 6375 (d) 5000 (e) 6625
- Find the difference between no. of students of college A in 2015 and 2017 together and of college B in 2016 and 2018 together.
 (a) 2500 (b) 3000 (c) 4500 (d) 4000 (e) 3500
- Students in college A in 2016 is what percent of the students in college B in 2017?
 (a) 33.33% (b) 25% (c) 50% (d) 75% (e) 66.67%
- What is the ratio between total no. of students in 2016 to that of 2018?
 (a) $\frac{28}{19}$ (b) $\frac{17}{19}$ (c) $\frac{27}{19}$ (d) $\frac{25}{19}$ (e) $\frac{21}{19}$
- Students in college A in 2016 and 2017 together is how much percentage more/less than that of college B in 2017 and 2018?
 (a) 50% (b) 25% (c) 0% (d) 75% (e) 100%

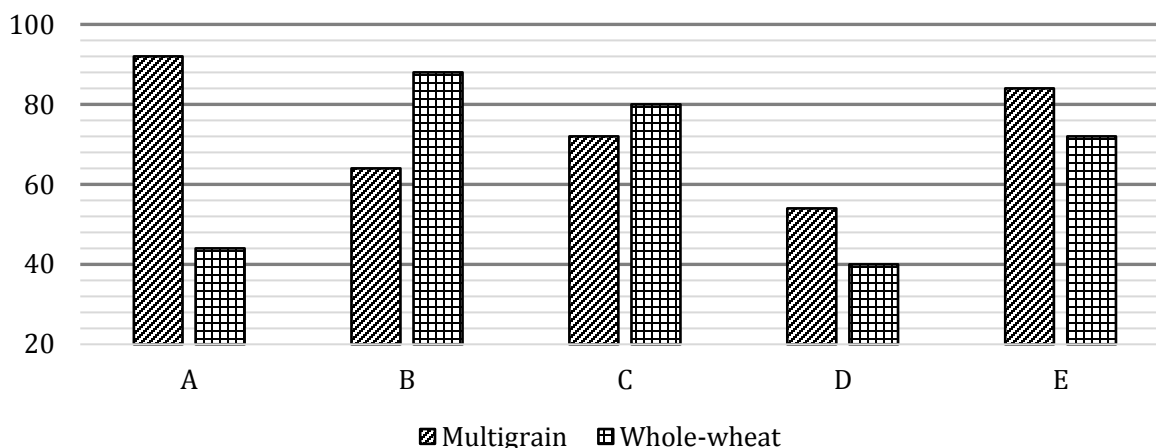
Directions (6-10): Bar graph given below shows pens sold by a retailer on five different days. Study the data carefully and answer the following questions



6. Find the difference between total number of pens sold on Monday and Tuesday together to total number of pens sold on Thursday and Friday together?
 (a) 15 (b) 10 (c) 5 (d) 20 (e) 0
7. Total number of pens sold on Saturday is 40% more than total number of pens sold on Wednesday. Find total number of pens sold on Friday and Saturday together?
 (a) 92 (b) 110 (c) 72 (d) 108 (e) 85
8. Total number of pens sold on Tuesday are 25% more than total number of pens sold on Sunday. Find total number of pens sold on Sunday?
 (a) 64 (b) 50 (c) 94 (d) 60 (e) 55
9. Out of total pens sold on Thursday, 20% are blue ink pen. Out of remaining 25% are red ink pen and remaining are black ink pen. Find total number of blue and black ink pen sold on Thursday?
 (a) 27 (b) 36 (c) 45 (d) 39 (e) 30
10. Out of total pens sold on Tuesday ratio between total defective pens sold to total pens sold is 7 : 15. Find total number of non-defective pens sold on Tuesday by retailer?
 (a) 20 (b) 25 (c) 30 (d) 35 (e) 40

Direction(11-15)- Study the bar-graph given below carefully and answer the questions.

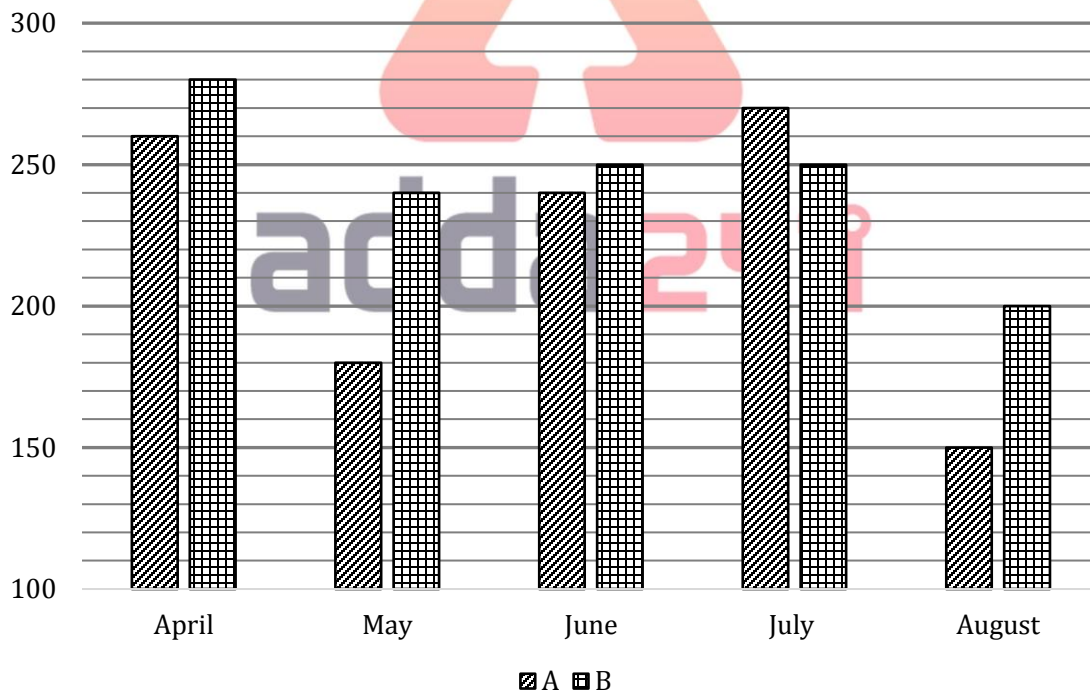
Bar-graph given below shows the number of packets of flour sold by five stores of two types i.e. multigrain and whole-wheat.



11. Total number of packets sold by store C is approximately what percent more or less than number of packets sold by store E?
 (a) 3% (b) 5% (c) 12% (d) 23% (e) 17%
12. What is the ratio of number of packets sold of multigrain by store A and D together to number of packets sold of whole-wheat by store A and E together?
 (a) 2 : 1 (b) 73 : 58 (c) 43 : 41 (d) 41 : 23 (e) None of these
13. Multigrain packets sold by store A and B together is what percent more or less than Whole-wheat packets sold by store C and D together?
 (a) 25% (b) 20% (c) 30% (d) None of these (e) 35%
14. If another store F sold number of multigrain packets which is average of number of multigrain packets sold by store C, D and E and number of whole-wheat packets sold is average of number of whole-wheat packets sold by store A and E. If store B sold each packet at Rs 240 and store F sold each packet at 20% more than that of B then find total price collected by store F?
 (a) Rs 24246 (b) Rs 28246 (c) None of these (d) Rs 36864 (e) Rs 32863
15. What is the difference of total number of multigrain packets sold by all store together and number of whole-wheat packets sold by all store together?
 (a) 48 (b) 54 (c) 42 (d) 36 (e) 24

Directions (16-20): Study the bar chart given below and answer the following questions.

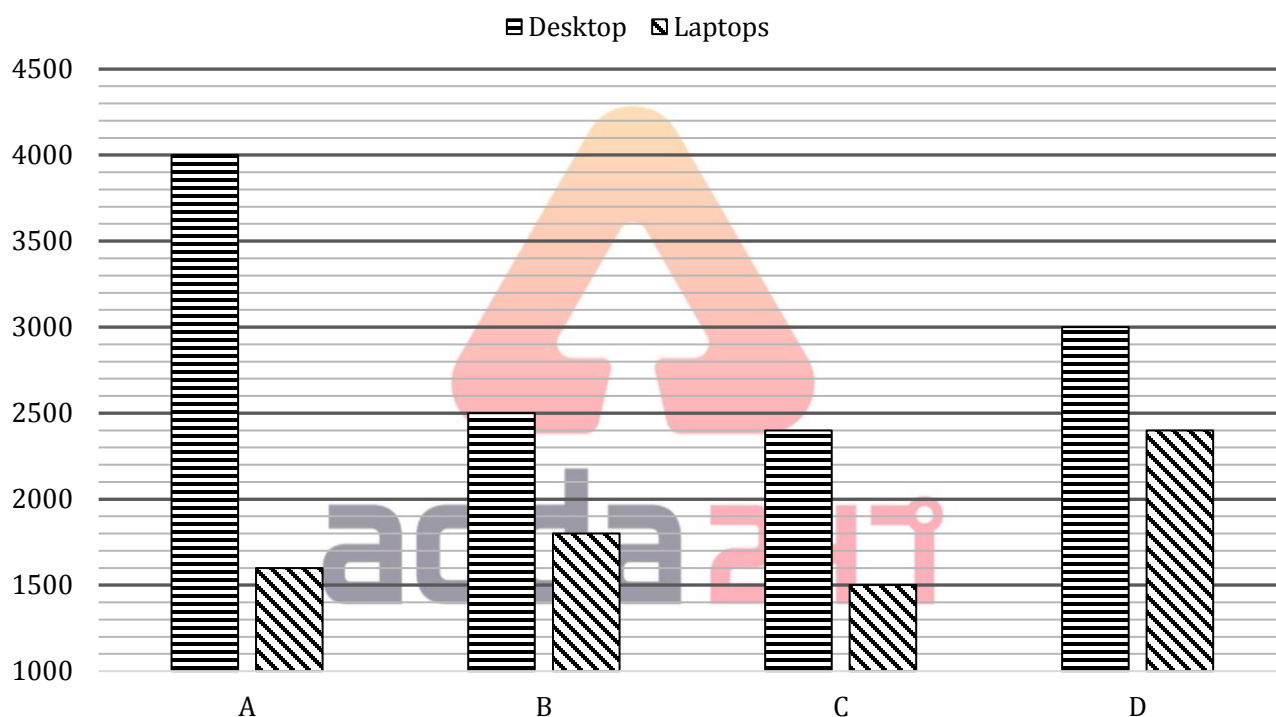
Bar chart shows the number of articles manufactured by two different companies (A & B) in 5 different months (April, May, June, July and August).



16. Articles manufactured by A in April and June together are what percent of articles manufactured by B in May and August together?
 (a) $109\frac{4}{11}\%$ (b) $118\frac{1}{11}\%$ (c) $116\frac{8}{11}\%$ (d) $113\frac{7}{11}\%$ (e) $107\frac{10}{11}\%$
17. If A sold 75%, 90%, & 80% of articles manufactured by it in April, May & August respectively, then find unsold articles of A in April, May & August together are how much more or less than articles manufactured by B in June?
 (a) 156 (b) 147 (c) 128 (d) 165 (e) 137

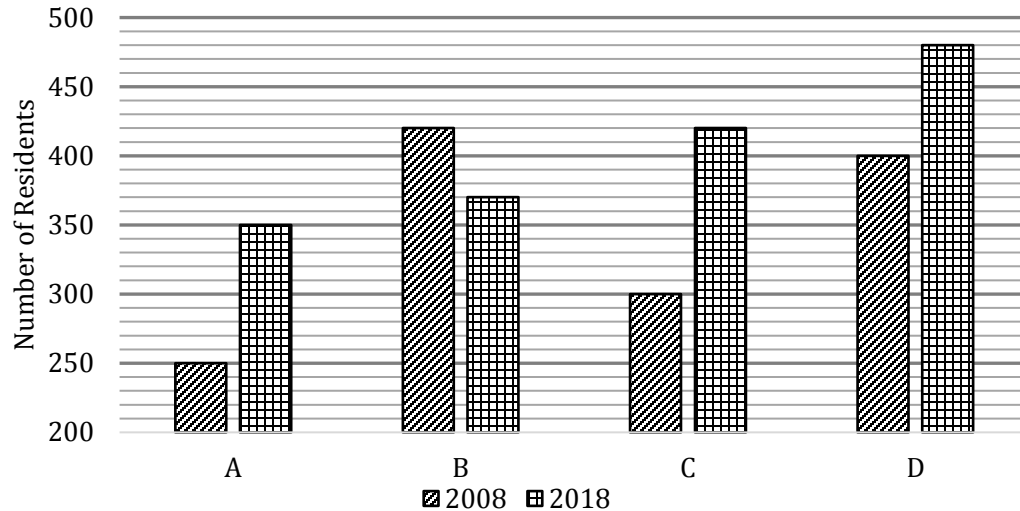
18. If B sold 80%, 60% & 90% of articles manufactured by it in April, May & June respectively and selling price of each article of B in April, May & June is Rs.8, Rs.12 & Rs.15 respectively, then find the revenue of B in April, May & June together.
 (a) Rs.6895 (b) Rs.6925 (c) Rs.6965 (d) Rs.6845 (e) Rs.6875
19. Find ratio of articles manufactured by A in June, July and August together to articles manufactured by B in April, May and June together.
 (a) 1 : 4 (b) 3 : 5 (c) 3 : 7 (d) 6 : 7 (e) None of the above.
20. Average number of articles manufactured by B in April, June and July are what percent more or less than articles manufactured by A in June and August together?
 (a) $66\frac{2}{3}\%$ (b) $33\frac{1}{3}\%$ (c) 50% (d) 25% (e) 75%

Directions (21-25): Given below is the bar graph which shows the number of Desktop and Laptops sold by four different shops A, B, C and D.



21. What is the average number of laptops sold by store B, C and D.
 (a) 1750 (b) 1700 (c) 1850 (d) 1900 (e) 1800
22. Desktops sold by store A is what percent more than Laptops sold by store C (approximately)?
 (a) 66% (b) 120% (c) 175% (d) 133% (e) 166%
23. Total Laptops sold by store B and C together are how much more or less than total Desktops sold by store C and D together?
 (a) 2100 (b) 2200 (c) 2150 (d) 1500 (e) 1800
24. What is the ratio of desktops sold by store A and C together to total Laptops sold by stores B and D together?
 (a) 32 : 23 (b) 33 : 19 (c) 32 : 21 (d) 33 : 20 (e) 32 : 19
25. Laptops sold by store B is what percent more or less than Laptops sold by store C.
 (a) $16\frac{2}{3}\%$ (b) 18% (c) 15% (d) 22% (e) 20%

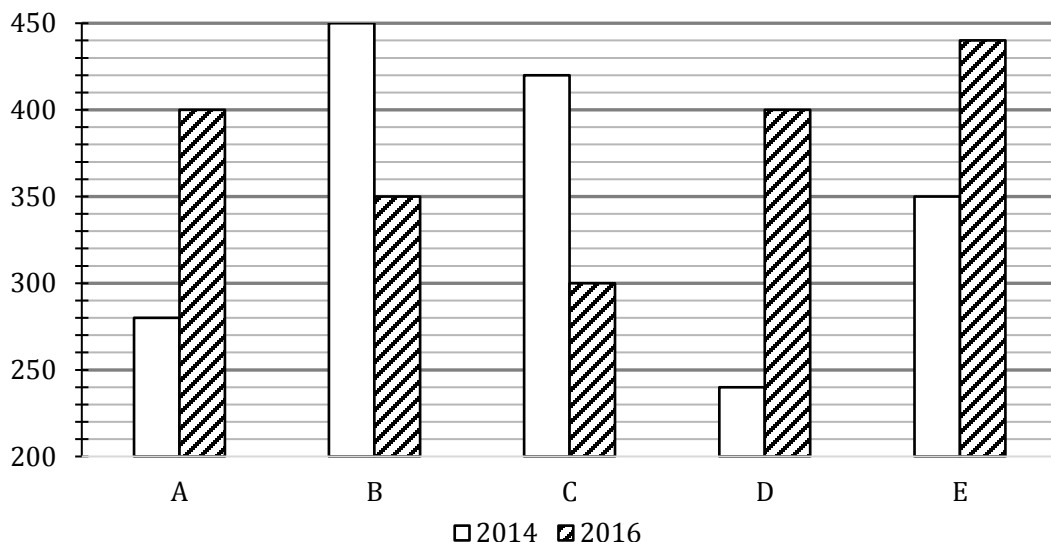
Directions (26 – 30): Given bar graph shows the number of residents residing in 4 societies in years 2008, 2018. Read the data carefully and answer the questions carefully.



26. What is average of residents residing in society A in 2008, B in 2018, C in 2018 & D in 2008?
 (a) 355 (b) 360 (c) 365 (d) 370 (e) 350
27. Residents residing in society B in 2008 are what percent more/less than average of residents residing in society D in 2008 & 2018?
 (a) $5\frac{6}{11}\%$ (b) $3\frac{6}{11}\%$ (c) $6\frac{6}{11}\%$ (d) $7\frac{6}{11}\%$ (e) $4\frac{6}{11}\%$
28. Which society shows maximum percentage increase in no. of residents from year 2008 to 2018?
 (a) Both A & C (b) Both A & D (c) Both C & D (d) Both A & B (e) None of these
29. What is ratio of all residents in all societies in 2008 to that of in 2018?
 (a) 142 : 157 (b) 157 : 142 (c) 162 : 137 (d) 137 : 162 (e) 97 : 114
30. What is difference between number of residents residing in society A & B in 2018 together and that of in society C & D together in 2008?
 (a) 30 (b) 24 (c) 20 (d) 28 (e) 26

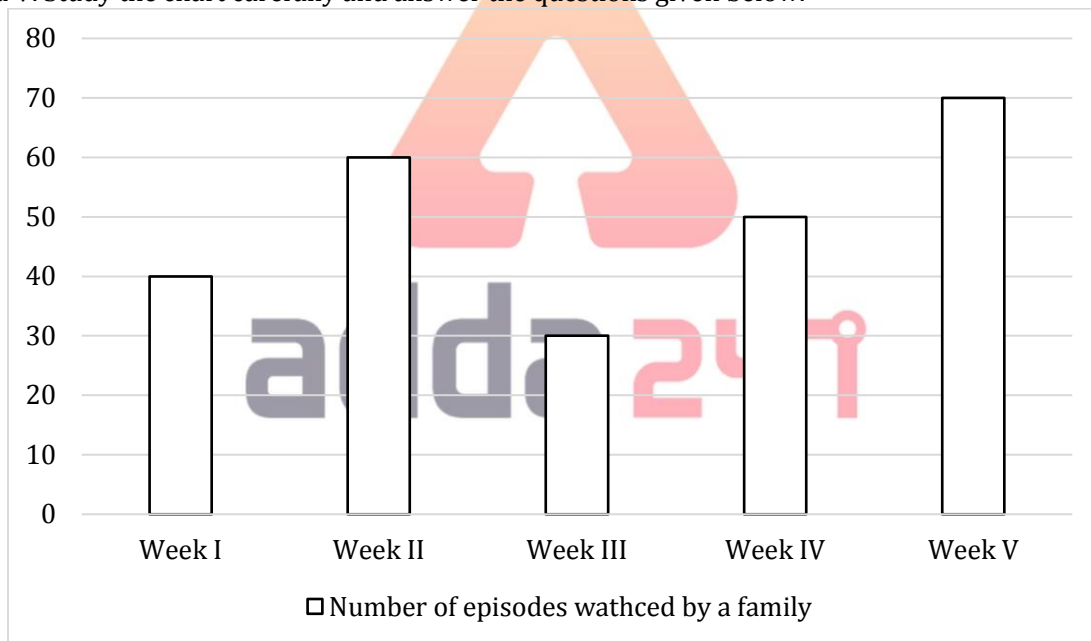
Direction (31-35): The given bar graph shows the total number of shirts sold by five stores in two different years. Read the data carefully and answer the questions.

Total shirts sold = Formal shirts sold + Casual shirts sold



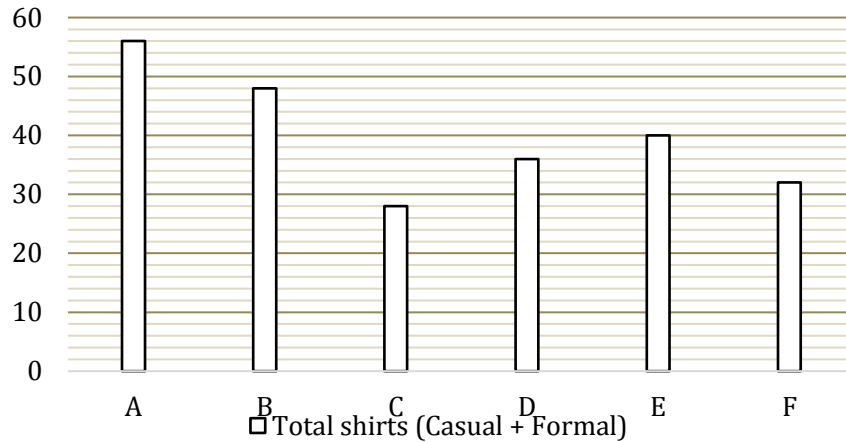
31. Total number of shirts sold by A and C together in year 2014 is what percent more or less than the total number shirts A and E together in year 2016.
 (a) 25% (b) 20% (c) $13\frac{1}{3}\%$ (d) $16\frac{2}{3}\%$ (e) 15%
32. What is the ratio of average number of student in school A and B in year 2014 to average number of student in same school in year 2016?
 (a) 73 : 75 (b) 71 : 75 (c) 71 : 73 (d) 69 : 73 (e) 75 : 73
33. Store D, sold 55% casual shirts in year 2014 and $62\frac{1}{2}\%$ casual shirts in year 2016. Find Total number of formal shirts sold by store D in both the years is approximately what percent of the total number of Casual shirts sold by store D in both the years?
 (a) 65% (b) 60% (c) 68% (d) 72% (e) 75%
34. Find the difference between the average of the number of shirts sold by store A, B and C in year 2016 and the average number of shirts sold by store B, C and D in year 2014?
 (a) 20 (b) 30 (c) 25 (d) 15 (e) 10
35. Find the average number of shirts sold by store B, C and D in both the years?
 (a) 680 (b) 720 (c) 750 (d) 700 (e) 650

Direction (36-40): The bar chart given below shows number of episodes watched by a family in five consecutive weeks I, II, III, IV, and V. Study the chart carefully and answer the questions given below.



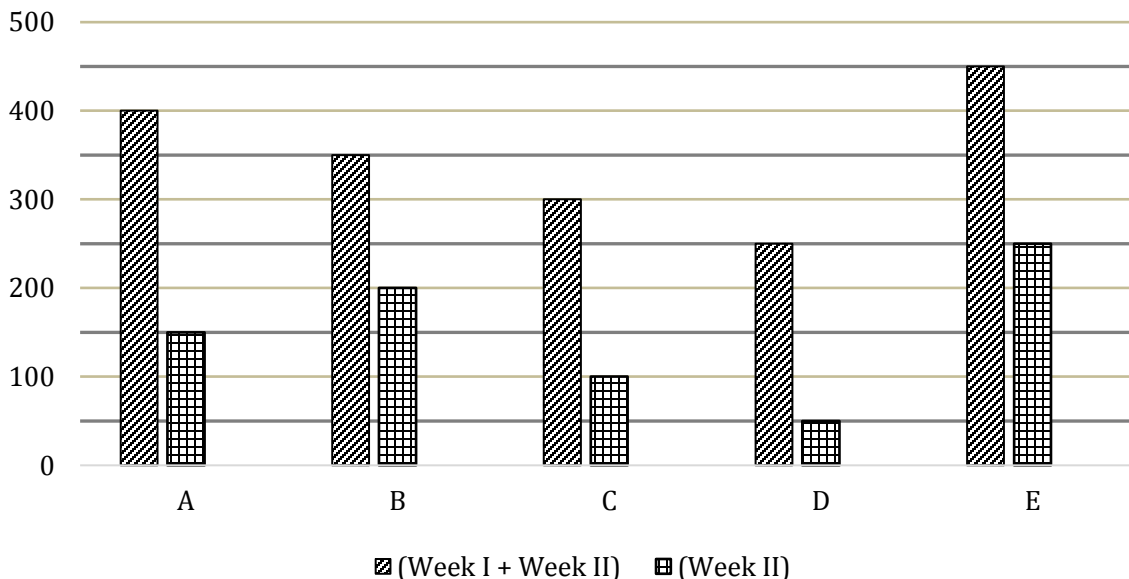
36. Find the ratio between number of episodes watched by family in week III to that of in week V.
 (a) 5:6 (b) 3:7 (c) 7:6 (d) 7:3 (e) 3:5
37. Find the average number of episodes watched by the family in all the given five weeks?
 (a) 40 (b) 50 (c) 60 (d) 30 (e) 70
38. Total episodes watched by the family in week II is what percent more than that of in week IV?
 (a) 25% (b) 15% (c) 20% (d) 10% (e) 30%
39. The number of episodes watched in week I is how much less than the number of episodes watched in week V?
 (a) 50 (b) 60 (c) 40 (d) 30 (e) 20
40. In which week the number of episodes watched was second lowest?
 (a) week I (b) week III (c) week IV (d) week V (e) week II

Direction (41 – 45): Bar graph given below shows total number of shirts (Casual + formal) sold by six (A, B, C, D, E & F) different shops. Read the data carefully and answer the questions.



41. Total shirts sold by B is what percent more than total shirts sold by E?
 (a) 20% (b) 25% (c) 30% (d) 15% (e) 10%
42. If total formal shirts sold by D is 25% more than total casual shirts sold by it, then find the total formal shirts sold by D?
 (a) 28 (b) 24 (c) 18 (d) 16 (e) 20
43. Find average number of shirts sold by A, C & D?
 (a) 30 (b) 40 (c) 36 (d) 32 (e) 48
44. If the ratio of total formal shirts to casual shirts sold by B and E is 3 : 5 and 2 : 3 respectively, then find total number of casual shirts sold by B & E together?
 (a) 44 (b) 48 (c) 54 (d) 60 (e) 64
45. Total shirts sold by B is what percent of total shirts sold by C & F together?
 (a) 70% (b) 56% (c) 64% (d) 80% (e) 60%

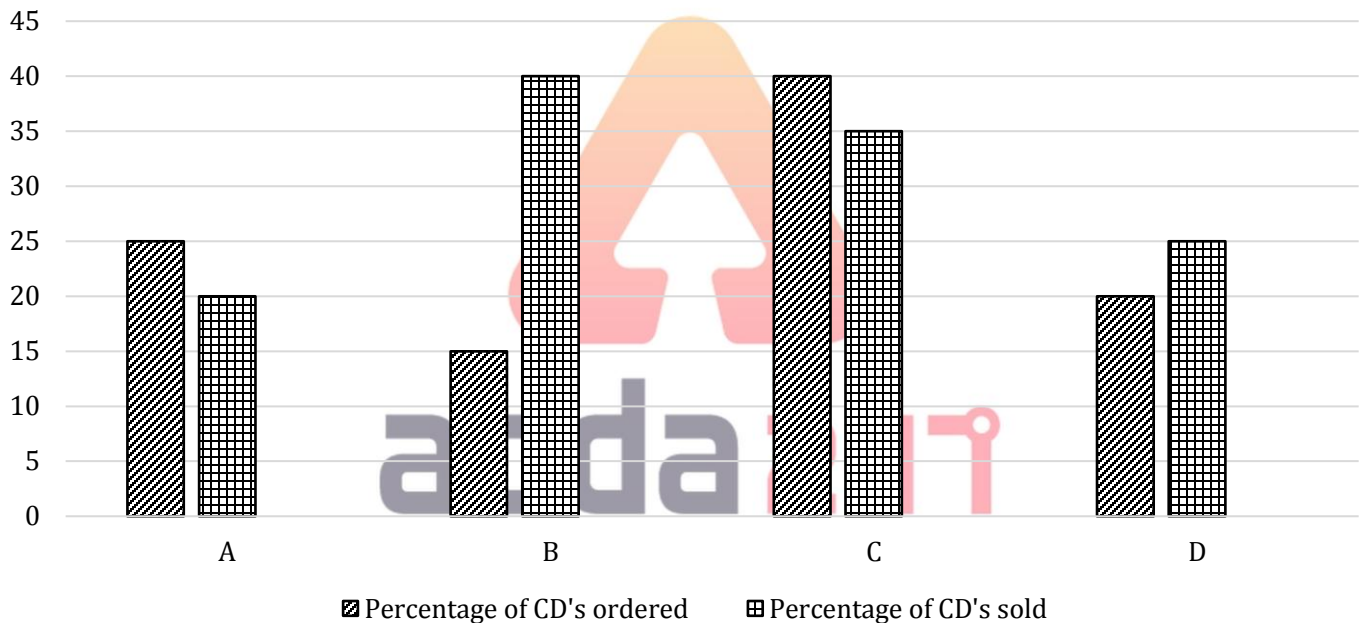
Direction (46 – 50): Bar graph given below shows total number of five different products sold by a shop in two (Week I + Week II) consecutive weeks and number of these five different products sold in Week II. Read the data carefully and answer the questions.



46. Total E sold in Week I is what percent more than that of total B sold in Week I?
 (a) $30\frac{1}{3}\%$ (b) $33\frac{1}{3}\%$ (c) $37\frac{1}{2}\%$ (d) 30% (e) 40%
47. Find the ratio of total C sold in Week II to total A sold in Week I?
 (a) 3 : 4 (b) 3 : 5 (c) 2 : 7 (d) 2 : 5 (e) 2 : 3
48. Find total B & C sold in Week I?
 (a) 250 (b) 350 (c) 150 (d) 100 (e) 200
49. Find average number of A, B & E sold in Week I?
 (a) 200 (b) 150 (c) 300 (d) 250 (e) 100
50. Total number of C sold in Week I is what percent of total number of A sold in Week I?
 (a) 90% (b) 85% (c) 80% (d) 60% (e) 50%

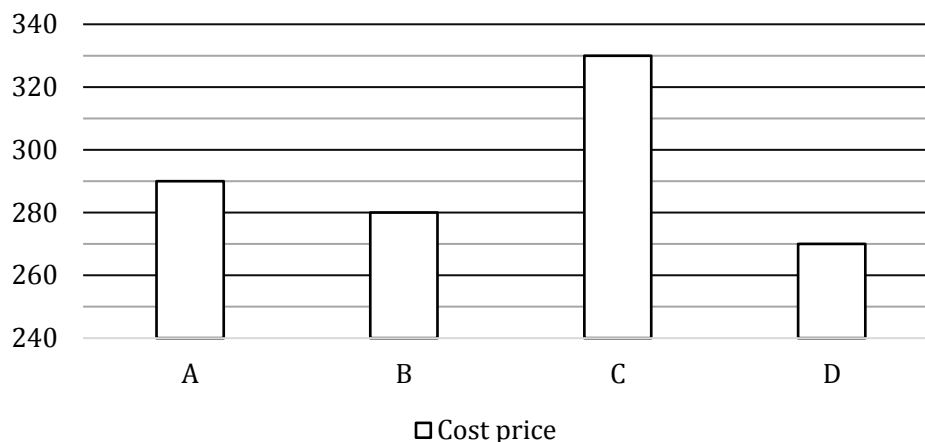
Direction (51 – 55): Given bar graph shows percentage distribution of total CD's ordered by four shopkeeper (A, B, C & D) and percentage of CD's sold by these four shopkeepers out of total CD's ordered by each. Read the data carefully and answer the questions.

Total CD's ordered by all four shopkeepers together = 600



51. Total unsold CD's by A & D together are how much more than total sold CD's by C?
 (a) 126 (b) 132 (c) 128 (d) 116 (e) 118
52. If total CD's sold by shopkeeper E are 125% more than total CD's sold by B and shopkeeper E sold 27% of total ordered CD's, then find total CD's ordered by E are what percent more than total CD's ordered by C?
 (a) 36% (b) 15% (c) 30% (d) 20% (e) 25%
53. Find average number of unsold CD's by B, C & D?
 (a) 120 (b) 100 (c) 80 (d) 110 (e) 72
54. Find ratio of total CD's sold by A & D together to total CD's sold by B?
 (a) 5 : 3 (b) 3 : 5 (c) 5 : 4 (d) 5 : 6 (e) 4 : 5
55. If total CD's ordered by shopkeeper X is 100% more than total unsold CD's by D and X sold 30% of total ordered CD's, then find unsold CD's by X are what percent of unsold CD's by A?
 (a) 105% (b) 110% (c) 100% (d) 96% (e) 90%

Direction (56-60): Read the given information carefully and answer the following questions.
The following bar graph shows the cost price (in Rs.) of four different products in 2014.



56. Find the difference between sum of cost price of products A and B together and that of C and D together?
 (a) Rs 20 (b) Rs 30 (c) Rs 10 (d) Rs 40 (e) Rs 25
57. Find the ratio of sum of cost price of B and D together to the cost price of C?
 (a) 6: 5 (b) 8: 5 (c) 4: 3 (d) 3: 2 (e) 5: 3
58. If the cost price of product B is increased by 25% in 2015 with respect to that of in 2014 then find the increment in the cost price of B?
 (a) Rs 90 (b) Rs 80 (c) Rs 60 (d) Rs 70 (e) Rs 50
59. Sum of cost price of products A and C together is approximately what percent more than the cost price of product D?
 (a) 130% (b) 135% (c) 125% (d) 128% (e) 132%
60. Average of the cost price of products B and C is how much more or less than the average of the cost price of products A and D?
 (a) Rs 20 (b) Rs 30 (c) Rs 15 (d) Rs 35 (e) Rs 25

Previous Years' Solutions of Prelims

- (e): required average = $\frac{5000+8000+9000+4500}{5} = 6625$
- (b): required difference = $(5000 + 9000) - (6000 + 5000)$
 $= 14000 - 11000 = 3000$
- (e): required percentage = $\frac{8000}{12000} \times 100$
 $= \frac{200}{3} \% = 66.67\%$
- (a): required ratio = $\frac{8000+6000}{4500+5000} = \frac{14000}{9500}$
 $= \frac{28}{19}$
- (c): required percentage = $\frac{(8000+9000)-(12000+5000)}{(12000+5000)} \times 100$
 $= \frac{17000-17000}{17000} \times 100 = 0\%$
- (c): Required difference = $25 + 75 - 45 - 50 = 5$
- (a): Total number of pens sold on Saturday = $30 \times 1.4 = 42$
 Total number of pens sold on Friday and Saturday together = $50 + 42 = 92$
- (d): Total number of pens sold on Sunday = $\frac{75}{125} \times 100 = 60$
- (b): Blue ink pen sold on Thursday = $45 \times \frac{20}{100} = 9$
 Red ink pen sold on Thursday = $(45 - 9) \times \frac{25}{100} = 9$
 Black ink pen sold on Thursday = $(45 - 9) \times \frac{75}{100} = 27$
 Total number of blue and black ink pen sold on Thursday = $9 + 27 = 36$
- (e): Total number of non-defective pens sold on Tuesday = $\frac{75}{15} \times 8 = 40$

$$11. (a): \text{Required \%} = \frac{(84+72)-(72+80)}{(72+84)} \times 100$$

$$= 3\%$$

$$12. (b): \text{Required ratio} = \frac{92+54}{44+72}$$

$$= 73 : 58$$

$$13. (c): \text{Required \%} = \frac{(92+64)-(80+40)}{(80+40)} \times 100$$

$$= 30\%$$

$$14. (d): \text{No. of packets sold by store F}$$

$$= \frac{1}{3} [72 + 54 + 84] + \frac{1}{2} [44 + 72]$$

$$= 70 + 58 = 128$$

$$\text{Required price} = 128 \times 240 \times \frac{120}{100}$$

$$= \text{Rs } 36864$$

$$15. (c): \text{Required difference} = (92 + 64 + 72 + 54 + 84) - (44 + 88 + 80 + 40 + 72)$$

$$= 366 - 324 = 42$$

$$16. (d): \text{Articles manufactured by A in April and June together} = (260 + 240)$$

$$= 500$$

$$\text{Articles manufactured by B in May and August together} = 240 + 200$$

$$= 440$$

$$\text{Required \%} = \frac{500}{440} \times 100 = 113 \frac{7}{11} \%$$

$$17. (e): \text{Unsold articles of A in April, May \& August together}$$

$$= \left(\frac{25}{100} \times 260\right) + \left(\frac{10}{100} \times 180\right) + \left(\frac{20}{100} \times 150\right)$$

$$= 65 + 18 + 30 = 113$$

$$\text{Required difference} = 250 - 113 = 137$$

$$18. (a): \text{Revenue of B in April} = 280 \times \frac{80}{100} \times 8$$

$$= \text{Rs. } 1792$$

$$\text{Revenue of B in May} = 240 \times \frac{60}{100} \times 12$$

$$= \text{Rs. } 1728$$

$$\text{Revenue of B in June} = 250 \times \frac{90}{100} \times 15$$

$$= \text{Rs. } 3375$$

$$\text{Required revenue} = 1792 + 1728 + 3375$$

$$= \text{Rs. } 6895$$

$$19. (c): \text{Articles manufactured by A in June, July and August together} = 240 + 270 + 150$$

$$= 660$$

$$\text{Articles manufactured by B in April, May and June together} = 280 + 240 + 250$$

$$= 770$$

$$\text{Required ratio} = \frac{660}{770}$$

$$= 6 : 7$$

$$20. (b): \text{Average number of articles manufactured by B in April, June and July} = \frac{1}{3} \times (280 + 250 + 250)$$

$$= 260$$

Articles manufactured by A in June and August together = 240 + 150

$$= 390$$

$$\text{Required \%} = \frac{390-260}{390} \times 100$$

$$= 33 \frac{1}{3} \%$$

$$21. (d): \text{Required average} = \frac{1800+1500+2400}{3}$$

$$= 600 + 500 + 800 = 1900$$

$$22. (e): \text{Required percentage} = \frac{4000-1500}{1500} \times 100$$

$$= 166 \frac{2}{3} \% \approx 166\%$$

$$23. (a): \text{Required number} = (2400 + 3000) - (1800 + 1500)$$

$$= 2100$$

$$24. (c): \text{Required ratio} = \frac{4000+2400}{1800+2400}$$

$$= 32 : 21$$

$$25. (e): \text{Required \%} = \frac{1800-1500}{1500} \times 100$$

$$= \frac{300}{15} = 20\%$$

$$26. (b): \text{required average} = \frac{250+370+420+400}{4} = 360$$

$$27. (e): \text{average of total residents in society D in 2008 \& 2018} = \frac{400+480}{2} = 440$$

$$\text{Required \%} = \frac{440-420}{440} \times 100 = 4 \frac{6}{11} \%$$

$$28. (a): \text{society A} = \frac{350-250}{250} \times 100 = 40\%$$

$$\text{Society B} = \frac{370-420}{420} \times 100 = 11.9\% \text{ (decrease)}$$

$$\text{Society C} = \frac{420-300}{300} \times 100 = 40\%$$

$$\text{Society D} = \frac{480-400}{400} \times 100 = 20\%$$

Maximum increase in society A \& C

$$29. (d): \text{all residents in 2008} = 250 + 420 + 300 + 400 = 1370$$

$$\text{Total residents in 2018} = 350 + 370 + 420 + 480 = 1620$$

$$\text{Required ratio} = 1370 : 1620 = 137 : 162$$

$$30. (c): \text{required difference} = (350 + 370) - (300 + 400) = 20$$

$$31. (d): \text{Required percentage} = \frac{(440+400)-(280+420)}{(440+400)} \times 100$$

$$= 16 \frac{2}{3} \%$$

$$32. (a): \text{Required ratio} = \frac{\frac{1}{2}(280+450)}{\frac{1}{2}(400+350)} = 73 : 75$$

$$33. (c): \text{Total number of Casual shirts sold by store D in both the years}$$

$$= \frac{55}{100} \times 240 + \frac{125}{2 \times 100} \times 400$$

$$= 132 + 250 = 382$$

Total number of formal shirts sold by store D in both the years

$$= 240 + 400 - 382 = 258$$

$$\text{Required percentage} = \frac{258}{382} \times 100 \approx 68\%$$

$$\begin{aligned} 34. (a): \text{Required difference} &= \left[\frac{1}{3} (450 + 420 + 240) - \frac{1}{3} (400 + 350 + 300) \right] \\ &= 370 - 350 = 20 \end{aligned}$$

$$35. (b): \text{Required average} = \frac{(450+350)+(420+300)+(240+400)}{3} = 720$$

$$36. (b): \text{Required ratio} = \frac{30}{70} = 3 : 7$$

$$37. (b): \text{Required average} = \frac{1}{5} (40 + 60 + 30 + 50 + 70) = 50$$

$$38. (c): \text{Required percentage} = \frac{60-50}{50} \times 100 = 20\%$$

$$39. (d): \text{Required difference} = 70 - 40 = 30$$

40. (a): By graph it is clear the number of episodes watched was second lowest in week I.

$$\begin{aligned} 41. (a): \text{Required percentage} &= \frac{48-40}{40} \times 100 \\ &= \frac{8}{40} \times 100 = 20\% \end{aligned}$$

$$\begin{aligned} 42. (e): \text{Let total casual shirts sold by D} &= 4x \\ \text{So, total formal shirts sold by D} &= 4x \times \frac{125}{100} = 5x \\ \text{Total formal shirts sold by D} &= 36 \times \frac{5x}{(4x+5x)} = 20 \end{aligned}$$

$$43. (b): \text{Required average} = \frac{56+28+36}{3} = 40$$

$$44. (c): \text{Total number of casual shirts sold by B \& D} = 48 \times \frac{5}{8} + 40 \times \frac{3}{5} = 30 + 24 = 54$$

$$45. (d): \text{Required percentage} = \frac{48}{(32+28)} \times 100 = 80\%$$

$$\begin{aligned} 46. (b): \text{Total E sold in Week I} &= 450 - 250 = 200 \\ \text{Total B sold in Week I} &= 350 - 200 = 150 \\ \text{Required percentage} &= \frac{200-150}{150} \times 100 \\ &= \frac{50}{150} \times 100 = 33\frac{1}{3}\% \end{aligned}$$

$$\begin{aligned} 47. (d): \text{Total C sold in Week II} &= 100 \\ \text{Total A sold in Week I} &= 400 - 150 = 250 \\ \text{Required ratio} &= 100 : 250 = 2 : 5 \end{aligned}$$

$$48. (b): \text{Required sum} = (350 - 200) + (300 - 100) = 150 + 200 = 350$$

$$\begin{aligned} 49. (a): \text{Total number of A sold in Week I} &= 400 - 150 = 250 \\ \text{Total number of B sold in Week I} & \end{aligned}$$

$$= 350 - 200 = 150$$

Total number of E sold in Week I

$$= 450 - 250 = 200$$

$$\text{Required average} = \frac{250+150+200}{3} = 200$$

$$50. (c): \text{Total number of C sold in Week I} = 300 - 100 = 200$$

Total number of A sold in Week I

$$= 400 - 150 = 250$$

$$\text{Required percentage} = \frac{200}{250} \times 100 = 80\%$$

$$\begin{aligned} 51. (a): \text{Total unsold CD's by A \& D} &= 600 \times \frac{25}{100} \times \frac{80}{100} + 600 \times \frac{20}{100} \times \frac{75}{100} \\ &= 120 + 90 = 210 \end{aligned}$$

$$\text{Total sold CD's by C} = 600 \times \frac{40}{100} \times \frac{35}{100} = 84$$

$$\text{Required difference} = 210 - 84 = 126$$

$$\begin{aligned} 52. (e): \text{Total CD's sold by E} &= 600 \times \frac{15}{100} \times \frac{40}{100} \times \frac{225}{100} = 81 \\ \text{Total CD's ordered by E} &= 81 \times \frac{100}{27} = 300 \end{aligned}$$

$$\text{Total CD's ordered by C} = 600 \times \frac{40}{100} = 240$$

$$\text{Required percentage} = \frac{300-240}{240} \times 100 = 25\%$$

$$\begin{aligned} 53. (b): \text{Total unsold CD's by B, C \& D} \\ &= 600 \times \frac{15}{100} \times \frac{60}{100} + 600 \times \frac{40}{100} \times \frac{65}{100} + 600 \times \frac{20}{100} \times \frac{75}{100} \\ &= 54 + 156 + 90 = 300 \\ \text{Required average} &= \frac{300}{3} = 100 \end{aligned}$$

$$\begin{aligned} 54. (a): \text{Total CD's sold by A \& D} \\ &= 600 \times \frac{25}{100} \times \frac{20}{100} + 600 \times \frac{20}{100} \times \frac{25}{100} \\ &= 30 + 30 = 60 \end{aligned}$$

$$\text{Total CD's sold by B} = 600 \times \frac{15}{100} \times \frac{40}{100} = 36$$

$$\text{Required ratio} = 60 : 36 = 5 : 3$$

$$55. (a): \text{Total CD's ordered by shopkeeper X} = 600 \times \frac{20}{100} \times \frac{75}{100} \times \frac{200}{100} = 180$$

$$\text{Unsold CD's by X} = 180 \times \frac{70}{100} = 126$$

$$\text{Unsold CD's by A} = 600 \times \frac{25}{100} \times \frac{80}{100} = 120$$

$$\text{Required parentage} = \frac{126-120}{120} \times 100 = 105\%$$

$$56. (b): \text{Required difference} = (330 + 270) - (290 + 280) = 600 - 570 = 30$$

$$57. (e): \text{Required ratio} = \frac{280+270}{330} = \frac{550}{330} = 5 : 3$$

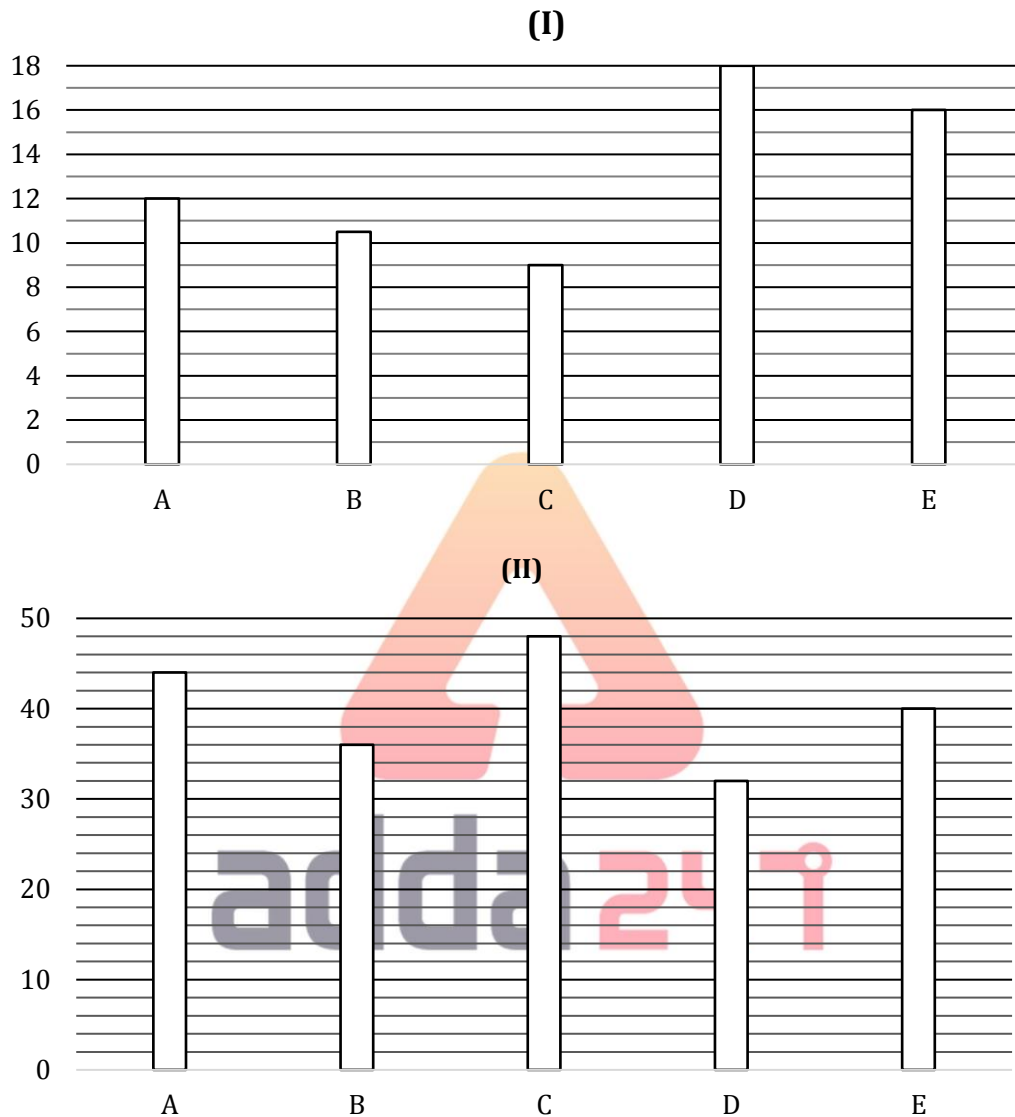
$$58. (d): \text{Required increment in cost price of B} = 0.25 \times 280 = \text{Rs } 70$$

$$59. (a): \text{Required \%} = \frac{(290+330)-270}{270} \times 100 = 130\%$$

$$\begin{aligned} 60. (e): \text{Required difference} \\ &= \frac{(330+280)}{2} - \frac{(290+270)}{2} = 305 - 280 = \text{Rs } 25 \end{aligned}$$

Previous Years' Questions of Mains

Direction (1 – 6): Given below bar graph (I) shows total students (Boys + girls) in thousands who have taken admissions in five different college and bar graph (II) shows percentage of girls taken admission in these five colleges. Read the data carefully and answer the questions.

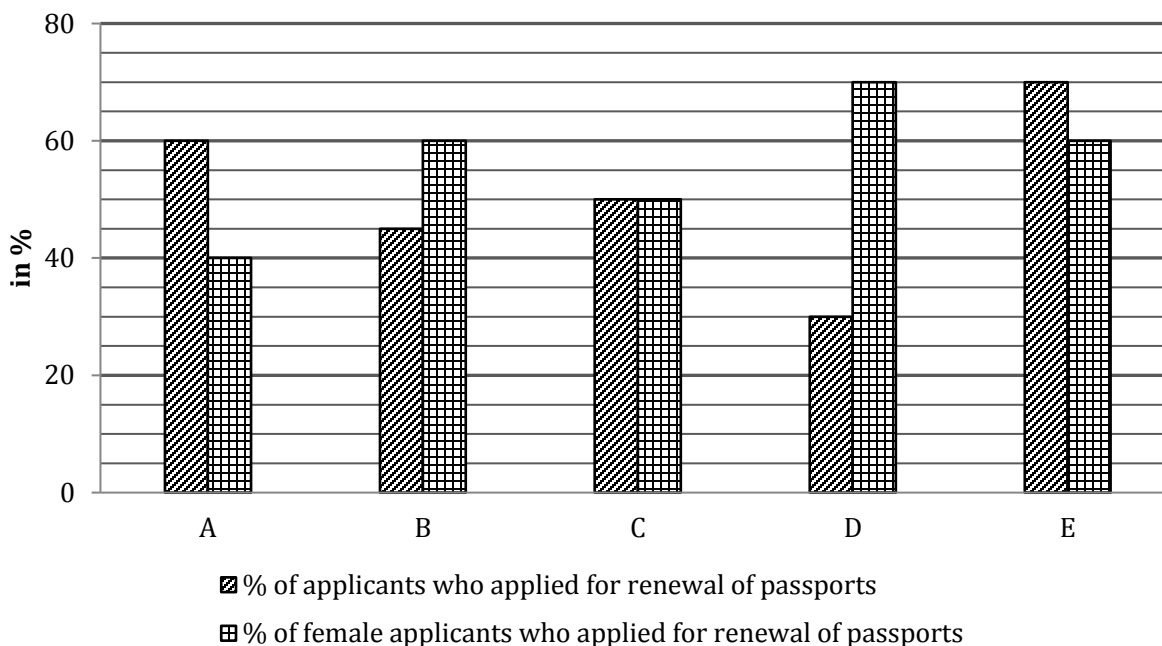


- Total boys taken admission in college B & D together are what percent more than total boys taken admission in E?
 (a) 92.5% (b) 97.5% (c) 99.5% (d) 102.5% (e) 84.5%
- 75% and 80% of total girls taken admission in college A & C respectively appeared in exam and total students appeared in exam from A & C is 17910. If total boys appeared in exam from A is 6048, then find difference between boys who did not appeared in exam from college A & C?
 (a) 438 (b) 428 (c) 418 (d) 408 (e) 448
- Find the ratio of total boys taken admission in college A & B together to total girls taken admission in D & E together?
 (a) 13 : 11 (b) 23 : 19 (c) 21 : 17 (d) 21 : 19 (e) None of these
- If in college F total girls taken admission are 62.5% more than that of total girls taken admission in C and total boys taken admission in college E & F together is 20580, then find percentage of girls taken admission in college F?
 (a) 33% (b) 43% (c) 39% (d) 37% (e) 45%

5. In each college there are only three streams (i.e. science, commerce & art) and in college B respective ratio of students taken admission in science, commerce & art is 2 : 1 : 4. If out of total girls taken admission in college B, 40% taken admission in science stream, 25% taken admission in commerce stream, then find difference between boys taken admission in art & science streams from college B?
 (a) 3242 (b) 3464 (c) 3189 (d) 3345 (e) 2964
6. Find the average number of boys taken admission from all the five given colleges?
 (a) 7992 (b) 7982 (c) 6848 (d) 7292 (e) None of these

Directions (7-12): Study the bar chart given below and answer the following questions.

Bar chart shows the percentage of applicants who applied for renewal of passports on 5 different passport centers (A, B, C, D & E) and percentage of female applicants who applied for renewal of passports out of total applicants who applied for renewal of passports.

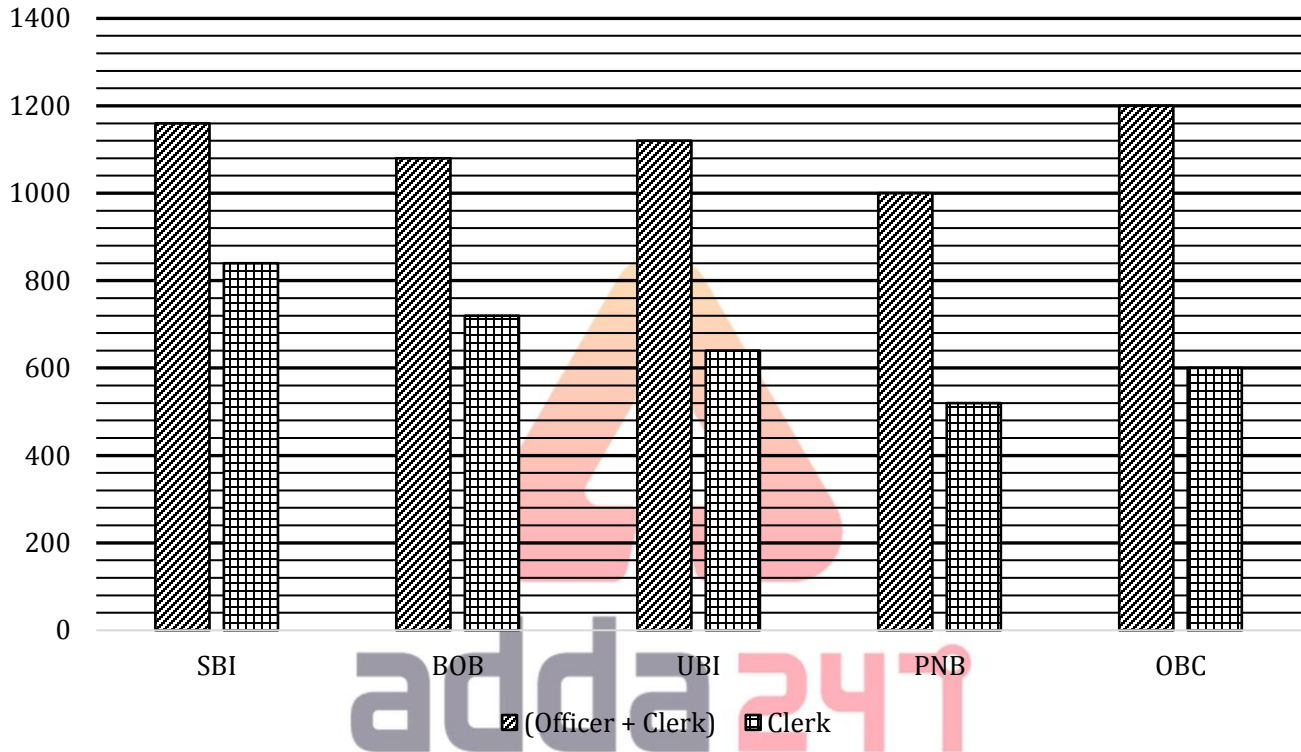


Note – Total number of applicants on a particular center = Number of applicants for new passport on that center + Number of applicants for renewal of passport on that center.

7. If total number of applicants in E are 70% of total number of applicants in A and ratio of male to female applicants who applied for new passports in A & E is 7 : 3 & 2 : 1 respectively, then find ratio of total female applicants in A to total female applicants in E.
 (a) 85 : 91 (b) 90 : 91 (c) 90 : 93 (d) 88 : 91 (e) None of the above.
8. If difference between male and female who applied for new passports from C is 800 and ratio of male to female who applied for new passports from C is 2 : 3, then find total female who applied for passports from C is what percent of total male who applied for passports from C?
 (a) $120\frac{2}{9}\%$ (b) $122\frac{2}{9}\%$ (c) $125\frac{2}{9}\%$ (d) $116\frac{2}{9}\%$ (e) $130\frac{2}{9}\%$
9. If difference between male and female who applied for renewal of passports from A is 2400, then find number of applicants who applied for new passport from A.
 (a) 9000 (b) 6000 (c) 7000 (d) 10000 (e) 8000
10. If total applicants from B are 5000 less than total applicants from E and male applicants who applied for renewal of passports from B is 3600, then find total number of applicants who applied for new passports from B & E together
 (a) 18500 (b) 21500 (c) 15500 (d) 19500 (e) 24500

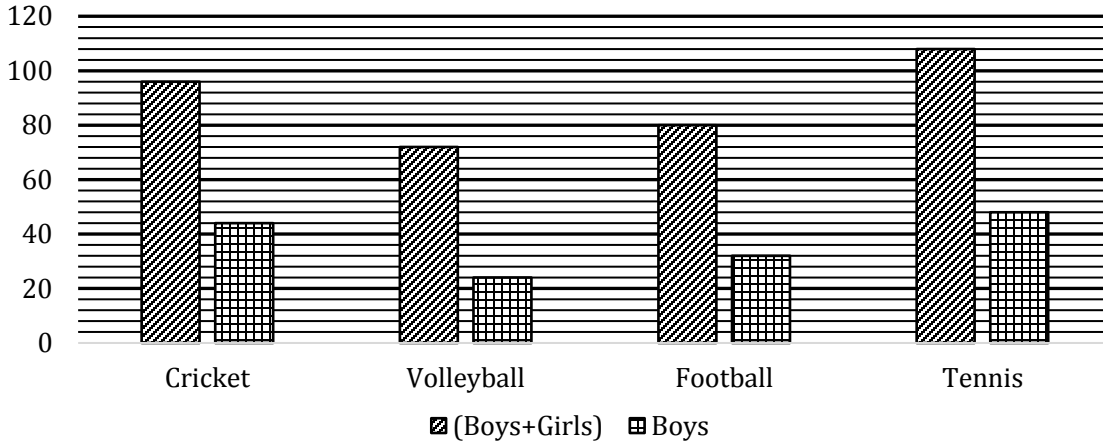
11. If total applicants from C & E together are 30000 and female applicants who applied for renewal of passports from C are 800 more than that of from E, then find average number of applicants who applied for new passports from C & E.
 (a) 9000 (b) 8000 (c) 6500 (d) 4000 (e) 11500
12. If ratio of applicants who applied for new passports from A to that of C is 2 : 3, then find total candidates who applied from C is what percent more than total candidates who applied from A?
 (a) 80% (b) 50% (c) 90% (d) 40% (e) 20%

Direction (13-17): - Bar graph given below shows total employees (Officer + Clerk) working in five different banks and number of Clerk working in these banks respectively. Study the data carefully and answer the following questions.



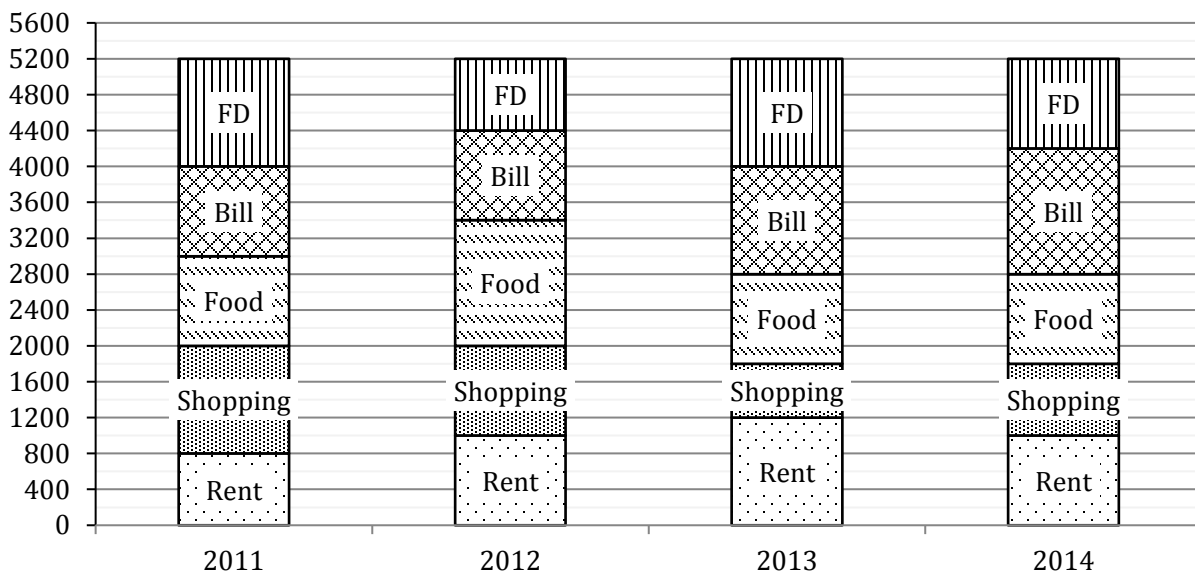
13. Find the ratio between Officers working in SBI and BOB together to Clerk working in UBI and OBC together?
 (a) None of the given options (b) 21 : 31 (c) 17 : 31
 (d) 17 : 29 (e) 21 : 29
14. Officers working in UBI and PNB together is what percent less than total employees (Officer + Clerk) working in OBC?
 (a) 20% (b) 80% (c) 40%
 (d) None of the given options (e) 60%
15. Find the average number of Officers working in all five banks together?
 (a) 458 (b) 664 (c) 448
 (d) 438 (e) None of the given options
16. Male officers working in OBC is 40% more than female officers working in OBC while male clerk working in OBC is 50% less than female clerk working in OBC. Find total female employees (Officers + Clerks) working in OBC?
 (a) 550 (b) 600 (c) 650 (d) 700 (e) 750
17. Find number of officers working in Allahabad bank if average number of officers working in SBI, BOB and Allahabad bank is 360?
 (a) 380 (b) 400 (c) None of the given options (d) 390 (e) 420

Direction (18-22): - Bar graph given below shows total students (Boys+Girls) who play four different games and number of boys who plays these games respectively. Study the data carefully and answer the following questions.



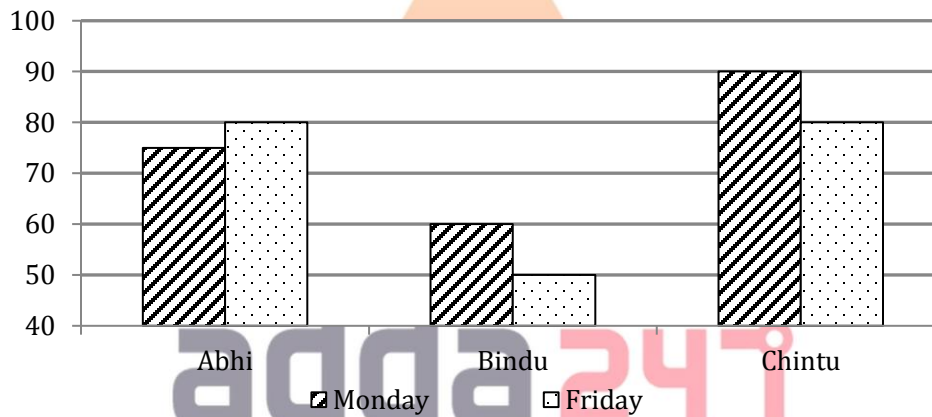
18. Find the ratio between total number of students (Boys+Girls) who play Cricket, Volleyball and Tennis to total number girls who play Volleyball and Football?
 (a) None of the given options (b) 21 : 8 (c) 23 : 16
 (d) 23 : 8 (e) 21 : 16
19. Total number of boys who play Cricket and Football is how much less than total students (Boys+Girls) who play Football and Tennis?
 (a) 112 (b) 116 (c) 118 (d) None of the given options (e) 114
20. Total number of boys who play Volleyball and Tennis is what percent of the total girls who play same game?
 (a) $33\frac{1}{3}\%$ (b) None of the given options (c) $66\frac{2}{3}\%$ (d) 50% (e) 25%
21. Out of total boys and girls play Football, 50% and $33\frac{1}{3}\%$ respectively qualified for nationals. Find total students (Boys+Girls) who were disqualified for nationals is what percent of total students (Boys+Girls) who play this game?
 (a) 40% (b) 60% (c) 50% (d) None of the given options (e) 80%
22. Find the average number of girls who play Volleyball, Football and Tennis?
 (a) 54 (b) 52 (c) None of the given options
 (d) 56 (e) 50

Direction (23-27): Study the given bar-graph carefully and answer the following question.
 Bar graph given below shows the expenditure of Rahul in four different years.



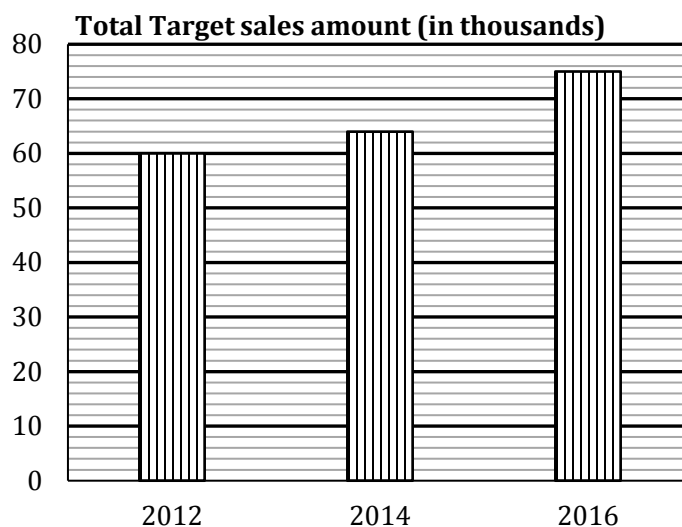
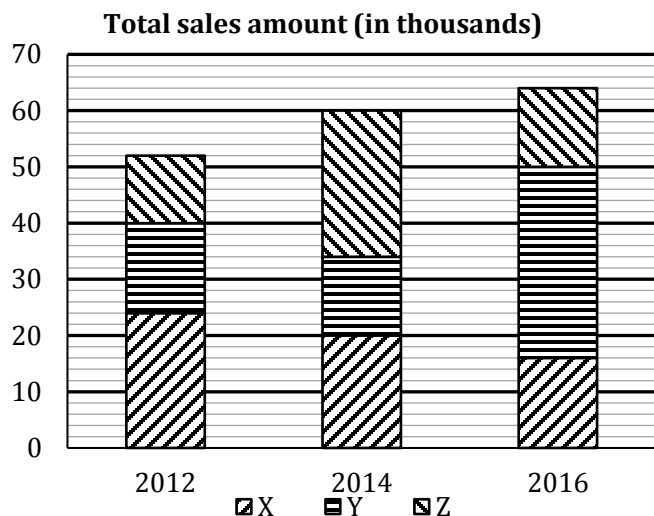
23. If bill paid by Rahul in year 2015 is 25% more than the average bill paid by him in year 2013 and 2014 and amount paid by him in FD in 2015 is twice the amount paid by him in FD in year 2011. Then find difference in amount of bill and FD paid by Rahul in year 2015 ?
 (a) Rs. 775 (b) Rs. 725 (c) None of these (d) Rs. 875 (e) Rs. 920
24. Total amount paid by Rahul on Food in year 2011 and 2012 together is what percent more or less than total amount paid by him on shopping in same year together ?
 (a) $14\frac{2}{7}\%$ (b) None of these (c) $11\frac{1}{9}\%$ (d) $9\frac{1}{11}\%$ (e) $12\frac{1}{2}\%$
25. If amount paid by Rahul in year 2010 on Rent is one-fifth of rent paid by him in all years. Then find ratio of rent paid by him in 2010 to amount paid by him on shopping in 2012 ?
 (a) 2 : 3 (b) 4 : 5 (c) 3 : 5 (d) 2 : 5 (e) None of these
26. If ratio of amount paid on bills in year 2015 to that of in year 2013 is 3 : 2 and ratio of amount paid by him on food, bills and rent in year 2015 is 1 : 2 : 4. Then find difference in amount paid by him on rent and food in year 2015 ?
 (a) None of these (b) Rs 1200 (c) Rs 900 (d) Rs 1800 (e) Rs 2700
27. Average of amount paid by Rahul in FD, rent and food in year 2012 is what percent of average of amount paid by him on Shopping, Rent and Bill in year 2013 ?
 (a) $123\frac{3}{5}\%$ (b) $106\frac{3}{5}\%$ (c) None of these (d) $112\frac{1}{5}\%$ (e) 108%

Direction (28-32): The given bar graph shows the percentage of query resolved by three people Abhi, Bindu and Chintu on Monday and Friday with respect to total calls received by them.



28. No. of query resolved by Abhi and Chintu on Friday is 360. What could be maximum number of calls that were not resolved by Abhi on Friday?
 (a) 89 (b) 40 (c) 12 (d) 100 (e) None of these
29. Number of queries resolved by Bindu on Monday is 180 and call received by him is 25% more than query resolved by Abhi on that day. Find the number of calls received by Abhi on Monday.
 (a) 260 (b) 440 (c) 360 (d) 400 (e) 320
30. If 20% calls increased from Monday to Friday for Bindu and Chintu and average number of query resolved by them on Friday is 30 more than that of Monday. Find call received by Chintu on Friday is how much more than that of received on Monday by him.
 (a) 125 (b) 220 (c) 120 (d) 200 (e) 250
31. What is the ratio of calls received by Abhi, Bindu and Chintu on Friday. If the number of query resolved by them is in the ratio of 3:4:2.
 (a) 12:33:19 (b) 14:32:11 (c) 15:32:10 (d) 10:35:12 (e) 8:7:9
32. Query resolved by Chintu on Monday is 60% of the query resolved by him on Friday. Query resolved by Abhi on Friday is equal to the sum of the query resolved by Chintu on both days. Call received by Abhi on Friday is what % more than that of Chintu on Monday.
 (a) 100% (b) 200% (c) 250% (d) 300% (e) 120%

Directions (33-37): first bar graph shows total sales amount done by three different companies in three different years and second bar graph shows the combined target sales amount of all the companies in three different years.

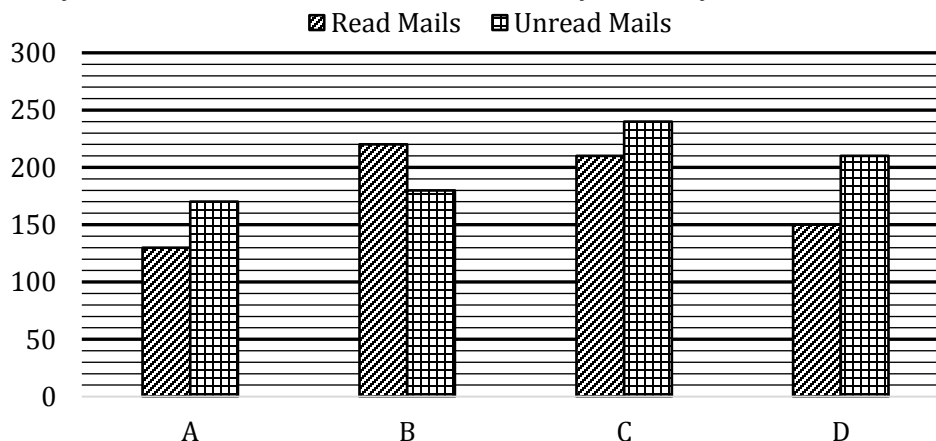


33. If sales done by company X and Y in 2012 increases by 20% and 25% respectively and sales of company Z remains constant, then find the difference between total target sales of all the companies in 2012 and sales done as per the condition? (in Rs.)
 (a) 800 (b) 8000 (c) 8800 (d) 6000 (e) 3000
34. If the ratio of sales done by company Y in 2016 to that of in 2018 is 17:15, then find the average sale of company Y in 2014, 2016 and 2018? (in Rs.)
 (a) 24000 (b) 25500 (c) 27000 (d) 26000 (e) 26500
34. If the total target sales of all companies together in 2018 is 20% more than that of in 2016 and sales done by company X and company Y in 2018 increases by 50% and 20% respectively than that of in 2016, then find by what percent sales of company Z be increased from 2016 to 2018 just to meet the total target sales in 2018?
 (a) 70% (b) 80% (c) 75% (d) 50% (e) 90%
36. Sales done by company Y in 2014 is what percent of total target sales of all companies in 2016?
 (a) $11\frac{1}{9}\%$ (b) $14\frac{2}{7}\%$ (c) $18\frac{2}{3}\%$ (d) $8\frac{1}{3}\%$ (e) $16\frac{2}{3}\%$
37. Total sales done by X in 2012, 2014 and 2016 together are how much more/less than the total sales done by Z in the same years? (in Rs.)
 (a) 11000 (b) 9000 (c) 7000 (d) 10000 (e) 8000

Directions (38-40): Bar chart given below shows number of mails read and unread on Monday by four different customer care executives. Study the chart and solve the following questions.

Note: Total received mail = Read mails + Unread mails

Mails received on Monday have no relevance to mails received on any other day.



38. Total mails received by E is 30% more than total mails received by A. If percentage of mails read out of total mails received is same for C and E then find the number of mails not read by 'E'.
 (a) 130 (b) 156 (c) 182 (d) 208 (e) 234
39. Total mails received by G is 25% more than total mails received by B while G's unread mail is 25% more than unread mails of C. If read mails sent by males to G is 78 more than read mails sent by female then find the number of read mails sent to 'G' by males?
 (a) 61 (b) 139 (c) 68 (d) 132 (e) 129
40. Total mails received by 'C' is sent by males and females. Mails sent by Males is 25% more than mails sent by females. Find the number of mails sent by males?
 (a) 200 (b) 250 (c) 280 (d) 320 (e) 300

Previous Years' Solutions of Mains

1. (b): Total boys take admission in college B & D together = $(10.5 \times \frac{64}{100} + 18 \times \frac{68}{100}) \times 1000$
 $= 6720 + 12240$
 $= 18960$
 Total boys take admission in E = $16 \times \frac{60}{100} \times 1000 = 9600$
 Required percentage = $\frac{18960-9600}{9600} \times 100$
 $= \frac{9360}{9600} \times 100$
 $= 97.5\%$
2. (a): Total girls appeared in exam from A = 12000
 $\times \frac{44}{100} \times \frac{75}{100} = 3960$
 Total girls appeared in exam from C = 9000
 $\times \frac{48}{100} \times \frac{80}{100} = 3456$
 Total boys appeared in exam from A & C together = $17910 - (3960 + 3456) = 10494$
 Total boys appeared in exam from C = $10494 - 6048 = 4446$
 Total boys who did not appear in exam from A = $12000 \times \frac{56}{100} - 6048 = 672$
 Total boys did not appear in exam from C = $9000 \times \frac{52}{100} - 4446 = 234$
 Required difference = $672 - 234 = 438$
3. (d): Total boys taken admission in college A & B = $12000 \times \frac{56}{100} + 10500 \times \frac{64}{100}$
 $= 6720 + 6720 = 13440$
 Total girls taken admission in D & E together = $18000 \times \frac{32}{100} + 16000 \times \frac{40}{100}$
 $= 5760 + 6400$
 $= 12160$
 Required ratio = $13440 : 12160$
 $= 21 : 19$
4. (c): Total girls taken admission in F = $9000 \times \frac{48}{100} \times \frac{13}{8} = 7020$
 Total boys taken admission in college F = $20580 - 16000 \times \frac{60}{100}$
 $= 20580 - 9600 = 10980$
 Required percentage = $\frac{7020}{(7020+10980)} \times 100$
 $= \frac{7020}{18000} \times 100 = 39\%$
5. (c): Students taken admission in science stream from B = $10500 \times \frac{2}{7} = 3000$
 Students taken admission in commerce stream from B = $10500 \times \frac{1}{7} = 1500$
 Students taken admission in art stream from B = $10500 \times \frac{4}{7} = 6000$
 Total boys taken admission in art stream from college B = $6000 - 10500 \times \frac{36}{100} \times \frac{35}{100} = 4677$
 Total boys taken admission in science stream from college B = $3000 - 10500 \times \frac{36}{100} \times \frac{40}{100} = 1488$
 Required difference = $4677 - 1488 = 3189$
6. (a): Total boys taken admission in college A = 12000
 $\times \frac{56}{100} = 6720$
 Total boys taken admission in college B = $10500 \times \frac{64}{100} = 6720$
 Total boys taken admission in college C = $9000 \times \frac{52}{100} = 4680$
 Total boys taken admission in college D = $18000 \times \frac{68}{100} = 12240$
 Total boys taken admission in college E = $16000 \times \frac{60}{100} = 9600$
 Required ratio = $\frac{6720+6720+4680+12240+9600}{5}$
 $= \frac{39960}{5} = 7992$

7. **(b):** Let total number of applicants in A be $100x$.
 So, total number of applicants in E = $70x$
 Female applicants who applied for renewal of passports from A = $100x \times \frac{60}{100} \times \frac{40}{100}$
 $= 24x$
 Female applicants who applied for new passports from A = $100x \times \frac{40}{100} \times \frac{3}{10}$
 $= 12x$
 Female applicants who applied for renewal of passports from E = $70x \times \frac{70}{100} \times \frac{60}{100}$
 $= 29.4x$
 Female applicants who applied for new passports from E = $70x \times \frac{30}{100} \times \frac{1}{3}$
 $= 7x$
 Required ratio = $\frac{24x+12x}{29.4x+7x} = \frac{36x}{36.4x}$
 $= 90 : 91$

8. **(b):** Let number of male and female who applied for new passports from C be $2x$ and $3x$ respectively.
 ATQ,
 $3x - 2x = 800$
 $x = 800$
 Total number of applicants for passports from C = $(3 \times 800 + 2 \times 800) \times \frac{100}{50}$
 $= 8000$
 Total female who applied for passports from C = $8000 \times \frac{50}{100} \times \frac{50}{100} + (3 \times 800)$
 $= 4400$
 Total male who applied for passports from C = $8000 - 4400$
 $= 3600$
 Required % = $\frac{4400}{3600} \times 100$
 $= 122\frac{2}{9}\%$

9. **(e):** Let total number of applicants in A be $100x$.
 ATQ,
 $100x \times \frac{60}{100} \times \left(\frac{60}{100} - \frac{40}{100}\right) = 2400$
 $12x = 2400$
 $x = 200$
 Hence, number of applicants who applied for new passport from A = $100 \times 200 \times \frac{40}{100}$
 $= 8000$

10. **(a):** ATQ,
 Total applicants from B = $3600 \times \frac{100}{40} \times \frac{100}{45}$
 $= 20000$
 Total applicants from E = $20000 + 5000$
 $= 25000$

$$\begin{aligned}\text{Required number of applicants} &= 20000 \times \frac{55}{100} + \\ & 25000 \times \frac{30}{100} \\ &= 18500\end{aligned}$$

11. **(c):** Let total number of applicants from C & E be $100x$ & $100y$ respectively.
 ATQ,
 $100x + 100y = 30000$
 $x + y = 300$ (i): Now,
 $100x \times \frac{50}{100} \times \frac{50}{100} - 100y \times \frac{70}{100} \times \frac{60}{100} = 800$
 $25x - 42y = 800$ (ii): On solving (i) & (ii), we get:
 $x = 200, y = 100$
 Required average = $\frac{1}{2} \times \left((100 \times 200 \times \frac{50}{100}) + (100 \times 100 \times \frac{30}{100}) \right)$
 $= \frac{1}{2} \times (10000 + 3000)$
 $= 6500$

12. **(e):** Let total number of applicants from A & C be $100x$ & $100y$ respectively.
 ATQ,
 Applicants who applied for new passports from A = $100x \times \frac{40}{100}$
 $= 40x$
 Applicants who applied for new passports from C = $100y \times \frac{50}{100}$
 $= 50y$
 Now,
 $\frac{40x}{50y} = \frac{2}{3}$
 $\frac{x}{y} = \frac{5}{6}$
 $y = \frac{6x}{5}$

$$\begin{aligned}\text{Required \%} &= \frac{100 \times \frac{6x}{5} - 100x}{100x} \times 100 \\ &= \frac{120x - 100x}{100x} \times 100 \\ &= 20\%\end{aligned}$$

13. **(c):** Officers in SBI and BOB together = $1160 - 840 + 1080 - 720 = 320 + 360 = 680$
 Clerk in UBI and OBC together = $640 + 600 = 1240$
 Required ratio = $\frac{680}{1240} = \frac{17}{31}$
14. **(a):** Officers working in UBI and PNB together = $1120 - 640 + 1000 - 520 = 480 + 480 = 960$
 Total employees (Officer + Clerk) working in OBC = 1200
 Required % = $\frac{1200 - 960}{1200} \times 100 = \frac{240}{1200} \times 100 = 20\%$

- 15. (c):** Total employees (Officer + Clerk) working in all five banks together = $1160 + 1080 + 1120 + 1000 + 1200 = 5560$
 Total Clerk working in all five banks together = $840 + 720 + 640 + 520 + 600 = 3320$
 Required average = $\frac{1}{5} [5560 - 3320] = \frac{1}{5} [2240] = 448$
- 16. (c):** Total officers working in OBC = $1200 - 600 = 600$
 Let, female officers working in OBC = x
 \Rightarrow Male officers working in OBC = $1.4x$
 Let, female clerk working in OBC = y
 \Rightarrow Male clerk working in OBC = $0.5y$
 ATQ, $x + 1.4x = 600$; $y + 0.5y = 600$
 $2.4x = 600$; $1.5y = 600$
 $x = 250$; $y = 400$
 Total female employees (Officers + Clerks) working in OBC = $x + y = 250 + 400 = 650$
- 17. (b):** Officers working in SBI = $1160 - 840 = 320$
 Officers working in BOB = $1080 - 720 = 360$
 Officers working in Allahabad bank = $360 \times 3 - 360 - 320 = 1080 - 680 = 400$
- 18. (d):** Required ratio = $\frac{96+72+108}{(72-24)+(80-32)} = \frac{276}{48+48} = \frac{276}{96} = \frac{23}{8}$
- 19. (a):** Total number of boys who play Cricket and Football = $44 + 32 = 76$
 Total students who play Football and Tennis = $80 + 108 = 188$
 Required difference = $188 - 76 = 112$
- 20. (c):** Total number of boys who play Volleyball and Tennis = $24 + 48 = 72$
 Total number of girls who play Volleyball and Tennis = $72 - 24 + 108 - 48 = 48 + 60 = 108$
 Required % = $\frac{72}{108} \times 100 = 66\frac{2}{3}\%$
- 21. (b):** Total number of boys who play Football = 32
 Total number of boys who qualified for nationals = $32 \times \frac{50}{100} = 16$
 Total number of girls who play Football = $80 - 32 = 48$
 Total number of girls who play qualified for nationals = $48 \times \frac{100}{300} = 16$
 Total students who were disqualified for nationals = $32 - 16 + 48 - 16 = 16 + 32 = 48$
 Required % = $\frac{48}{80} \times 100 = 60\%$
- 22. (b):** Total number of girls who play Volleyball = $72 - 24 = 48$
 Total number of girls who play Football = $80 - 32 = 48$
 Total number of girls who play Tennis = $108 - 48 = 60$
 Required average = $\frac{1}{3} (48 + 48 + 60) = \frac{156}{3} = 52$
- 23. (a):** Bill paid by Rahul in year 2015
 $= \frac{(1200+1400)}{2} \times \frac{125}{100}$
 $= \text{Rs } 1625$
 Amount paid by him in FD = $1200 \times 2 = \text{Rs } 2400$
 Required difference = $2400 - 1625 = \text{Rs. } 775$
- 24. (d):** Total amount paid by Rahul on Food in year 2011 and 2012 together
 $= 1000 + 1400 = \text{Rs } 2400$
 Total amount paid by him on shopping in same year together
 $= 1200 + 1000 = \text{Rs } 2200$
 Required percentage = $\frac{2400-2200}{2200} \times 100$
 $= 9\frac{1}{11}\%$
- 25. (b):** Amount paid by Rahul on Rent in year 2010
 $= \frac{1}{5} [800 + 1000 + 1200 + 1000]$
 $= \frac{1}{5} [4000] = \text{Rs } 800$
 Required ratio = $\frac{800}{1000} = 4 : 5$
- 26. (e):** Amount paid by Rahul on Bill in 2015
 $= \frac{1200}{2} \times 3 = \text{Rs } 1800$
 Required difference = $\frac{1800}{2} \times 3 = \text{Rs } 2700$
- 27. (b):** Average amount paid by Rahul in FD Rent and Food in year 2012
 $= \frac{800+1000+1400}{3} = \text{Rs } \frac{3200}{3}$
 Average amount paid by Rahul on Shopping, Rent and Bill in year 2013
 $= \frac{600+1200+1200}{3} = \frac{3000}{3} = \text{Rs } 1000$
 Required percentage = $\frac{3200}{3000} \times 100 = 106\frac{2}{3}\%$
- 28. (a):** Let Abhi and Chintu received $100x$ & $100y$ calls respectively
 So ATQ
 $80x + 80y = 360$
 $x + y = 4.5$
 Total calls = $100x + 100y = 450$
 Abhi could receive maximum calls = 445
 As Chintu resolved 80% of calls, and therefore, we will get an integer value when he atleast get 5 calls.
 So maximum calls that were not resolved
 $\Rightarrow 445 \times \frac{20}{100} = 89$
- 29. (e):** Call received by Bindu on monday
 $= \frac{180}{60} \times 100 = 300$
 Query resolved by Abhi on Monday
 $\frac{300}{5} \times 4 = 240$
 Calls received by Abhi on Monday
 $\Rightarrow \frac{240}{75} \times 100 = 320$

- 30. (d):** Let calls received by Bindu and Chintu on Monday be $100x$ and $100y$ respectively.
Calls received by them on Friday $120x$ and $120y$ respectively.
Now query resolved
Monday $\rightarrow 60x + 90y$
Friday $\rightarrow 60x + 96y$
ATQ,
$$\frac{60x+96y}{2} - \frac{60x+90y}{2} = 30$$
$$3y = 30$$
$$y = 10$$
Required answer $\rightarrow 10 \times 20 = 200$
- 31. (c):** Let query resolved by Abhi, Bindu and Chintu $300x$, $400x$ and $200x$ respectively
Required ratio
$$\Rightarrow \frac{300x}{80} \times 100 : \frac{400x \times 100}{50} : \frac{200x \times 100}{80}$$
$$15 : 32 : 10$$
- 32. (b):** Let call received by Chintu on Monday $\rightarrow 100x$
Query resolved by Chintu on Monday $\rightarrow 90x$
Query resolved by Chintu on Friday $\rightarrow \frac{90x}{60} \times 100$
 $= 150x$
Query resolved by Abhi on Friday $\Rightarrow 90x + 150x$
 $\Rightarrow 240x$
Call received by Abhi on Friday =
$$\frac{240x}{80} \times 100 = 300x$$
Required $\% = \frac{300x-100x}{100x} \times 100 = 200\%$
- 33. (a):** Sales done by company X in 2012 = $24000 \times \frac{120}{100} = \text{Rs. } 28800$
Sales done by company Y in 2012 = $16000 \times \frac{125}{100} = \text{Rs. } 20000$
Sales done by company Z in 2012 = $\text{Rs. } 12000$
Total sales done by company X, Y and Z in 2012 = $28800 + 20000 + 12000 = \text{Rs. } 60800$
Total target sales of all the companies in 2012 = $\text{Rs. } 60000$
Required difference = $60800 - 60000 = \text{Rs. } 800$
- 34. (d):** Sales done by company Y in 2018
 $= \frac{15}{17} \times 34000 = 30000 \text{ Rs.}$
Required Average
$$= \frac{14000+34000+30000}{3} = 26000 \text{ Rs.}$$
- 35. (b):** Sales done by company X in 2018 = $16000 \times \frac{150}{100} = \text{Rs. } 24000$

Sales done by company Y in 2018 = $34000 \times \frac{120}{100} = \text{Rs. } 40800$
Total target sales of all the companies together in 2018 = $75000 \times \frac{120}{100} = \text{Rs. } 90000$
Sales done by company Z in 2018 to meet the total target sales
 $= 90000 - 24000 - 40800 = 25200 \text{ Rs.}$
Sales done by company Z in 2016 = 14000 Rs.
Required $\% = \frac{25200-14000}{14000} \times 100 = 80\%$

- 36. (c):** Required $\% = \frac{14000}{75000} \times 100 = \frac{56}{3} \% = 18\frac{2}{3} \%$
- 37. (e):** Total sales done by X in 2012, 2014 and 2016 together = $24000 + 20000 + 16000 = 60000 \text{ Rs.}$
Total sales done by Z in 2012, 2014 and 2016 together = $12000 + 26000 + 14000 = 52000 \text{ Rs.}$
Required difference = $60000 - 52000 = 8000 \text{ Rs.}$
- 38. (d):** Total mails received by E
 $= \frac{130}{100} \times (130 + 170) = \frac{130}{100} \times 300 = 390$
Percentage of mails read by E = $\frac{210}{450} \times 100$
 $= \frac{140}{3} \%$
Number of mails not read by E = $390 \times \left[1 - \frac{140}{300}\right]$
 $= \frac{390}{300} \times (300 - 140) = \frac{130 \times 160}{100} = 208$
- 39. (b):** Total mails received by G = $\frac{125}{100} \times (220 + 180)$
 $= \frac{125}{100} \times 400 = 500$
Males not read by G = $\frac{125}{100} \times 240 = 300$
Mails read by G = $500 - 300 = 200$
Let, read mails sent by females = x
And, read mails sent by males = $x + 78$
ATQ,
 $x + x + 78 = 200$
 $\Rightarrow x = \frac{200-78}{2} = 61$
Read mails sent by males = $61 + 78 = 139$
- 40. (b):** Total males received by C = $210 + 240 = 450$
Let number of mails sent by females = x
Then, number of mails sent by males = $1.25x$
ATQ,
 $x + 1.25x = 450$
 $\Rightarrow x = \frac{450}{2.25} = 200$
Number of males sent by males = $200 \times 1.25 = 250$



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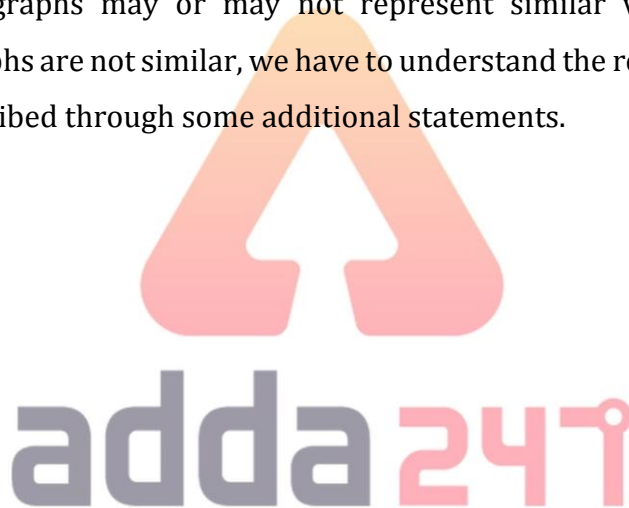
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Chapter 06

Mixed Graph

Mixed graphs are a combination of two or more graphs. Sometimes, the data that need to be represented contains numerous variables which are hard to represent through a single representation format. In other cases, the data need to be segregated into small parts for effective representation. Hence, the data is segregated and represented through two or more than two suitable graphs. These graphs may or may not represent similar variables. If the variables represented by these graphs are not similar, we have to understand the relationships between these variables which are described through some additional statements.



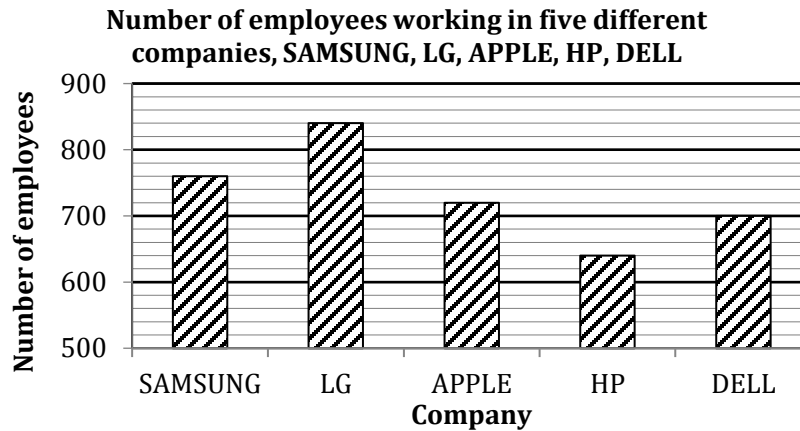
This chapter contains:

- Concept with Solved Examples
- Practice MCQs for Prelims
- Practice MCQs for Mains
- Previous Years' Questions of Prelims
- Previous Years' Questions of Mains

Solved Examples

Directions (1 - 5): Study the following bar diagram and table carefully to answer the questions:

Bar graph shows number of total employees working in five different company and table shows Ratio of male to female in these five companies.



Companies →	Samsung	LG	Apple	HP	DELL
Ratio of male to female	13 : 6	4 : 3	7 : 8	9 : 11	13 : 12

1. What is the ratio of female employees in company Samsung and H.P. together to the females in company DELL and Apple together.

(a) 43 : 53 (b) 54 : 59 (c) 37 : 45 (d) 23 : 27 (e) 20 : 23

Sol. (c); Required ratio = $\frac{\frac{6}{19} \times 760 + \frac{11}{20} \times 640}{\frac{12}{25} \times 700 + \frac{8}{15} \times 720} = \frac{240 + 352}{336 + 384} = \frac{592}{720} = 37 : 45$

2. Males from company Samsung and HP together is what percent of total employees in company Apple. (approximately)

(a) $125\frac{2}{9}\%$ (b) $112\frac{2}{9}\%$ (c) $130\frac{2}{9}\%$ (d) $135\frac{2}{9}\%$ (e) $138\frac{2}{9}\%$

Sol. (b); Males from company Samsung and HP together

$$= 760 \times \frac{13}{19} + 640 \times \frac{9}{20} = 520 + 288 = 808$$

$$\text{Required percentage} = \frac{808}{720} \times 100 = 112\frac{2}{9}\%$$

3. If 20% females from LG company resigns and 12.5% females resigns from company H.P. then what is the ratio of remaining employees in LG to remaining employees in HP.

(a) 192 : 149 (b) 153 : 129 (c) 72 : 73 (d) 53 : 42 (e) 57 : 49

Sol. (a); Required ratio = $\frac{840 - \frac{3}{7} \times 840 \times \frac{20}{100}}{640 - \frac{11}{20} \times 640 \times \frac{12.5}{100}} = \frac{840 - 72}{640 - 44} = 768 : 596 = 192 : 149$

4. What is the difference between average of males from Samsung and HP together to the average of females from company Apple and DELL together.

(a) 40 (b) 42 (c) 44 (d) 36 (e) 28

Sol. (c); Average of males from Samsung and HP

$$= \left(760 \times \frac{13}{19} + 640 \times \frac{9}{20} \right) \frac{1}{2} = (520 + 288) \frac{1}{2} = 404$$

Average of females from Apple and DELL

$$= \left(720 \times \frac{8}{15} + 700 \times \frac{12}{25} \right) \frac{1}{2} = (384 + 336) \frac{1}{2} = 360$$

Required difference

$$= 404 - 360 = 44$$

5. If ratio of number of females at present to the number of females next year in company Apple is 8 : 11 so, what should be increase or decrease in number males in Apple so that overall number of employees in Apple next year is same as present total number of employees in LG.

(a) 24 (b) 6 (c) 12 (d) 20 (e) 16

Sol. (a); Number of females in company Apple next year

$$= 720 \times \frac{8}{15} \times \frac{1}{8} \times 11 = 528$$

Male employees in Apple next year

$$= 840 - 528 = 312$$

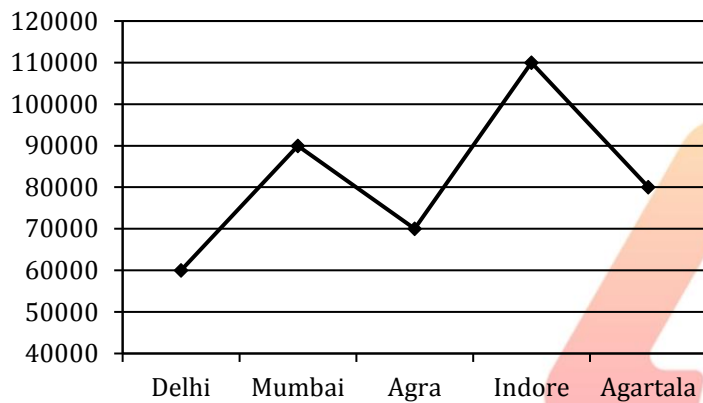
$$\text{Males at present in Apple} = 720 \times \frac{7}{15} = 336$$

$$\text{So, In next year male decreases by} = 336 - 312 = 24$$

Directions (6-10): Read the data given below and answer the following questions.

Given below is the line graph which shows the population of five cities in 2016 and table shows the ratio of male to female in these five cities.

NOTE- Some values are missing in the table, you have to calculate these values if necessary to answer the questions.



Cities	M : F
Delhi	3 : 5
Mumbai	7 : 5
Agra	3 : 4
Indore	6 : 5
Agartala	- : 5

6. If there is an increase of 25% and 15% population of male & female live in Delhi in year 2017 with respect to previous year. Then what will be total percentage rise in the population of Delhi in 2017 with respect to previous year?

(a) 18.85% (b) 18.65% (c) 19% (d) 18% (e) 18.75%

Sol. (e); In 2017

$$= 60,000 \times \frac{3}{8} \times \frac{125}{100} + 60,000 \times \frac{5}{8} \times \frac{115}{100}$$

$$28,125 + 43,125 = 71,250$$

$$\text{Total increased population} = 71,250 - 60,000 = 11,250$$

$$\% \text{ increase} = \frac{11,250}{60,000} \times 100 = 18.75\%$$

7. In Agartala $\frac{1}{8}$ th of person affected from Dengue then what is ratio of un-affected females to unaffected male in Agartala. If no. of un-affected males in Agartala is same as no. of males in Delhi

(a) 9 : 19 (b) 19 : 9 (c) 17 : 9 (d) 9 : 17 (e) 17 : 9

Sol. (b); Unaffected person = $\frac{7}{8} \times 80,000 = 70,000$

No. of un-affected males in Agartala = No. of males in Delhi

$$= 60,000 \times \frac{3}{8} = 22,500$$

No. of unaffected females = 47,500

$$\text{Ratio} = \frac{47,500}{22,500} = \frac{475}{225} = \frac{19}{9}$$

8. What was the difference of male & female in Mumbai city in 2014 if there is an increase in 20% of population every year?

(a) 10417 (b) 10217 (c) 10317
(d) 10400 (e) Cannot be determined

Sol. (e); Cannot be determined since ratio of population of males and females in Delhi in 2014 is not given

9. Males of Mumbai is what percent less or more than the male of Agartala if the average number of males in Delhi, Agra & Agartala is 27,500?

(a) 42.86% less (b) 75% less (c) 75% more (d) 42.86% more (e) 62.5% more

Sol. (c); Males in Delhi + Agra + Agartala = $27,500 \times 3$
= 82,500

$$\begin{aligned}\text{Males in Agartala} &= 82500 - \frac{3}{8} \times 60,000 - \frac{3}{7} \times 70,000 \\ &= 82500 - 22500 - 30,000 \\ &= 30,000\end{aligned}$$

$$\text{Males in Mumbai} = \frac{7}{12} \times 90,000 = 52,500$$

$$\text{required\%} = \frac{52,500 - 30,000}{30,000} = 75\% \text{ more}$$

10. If $\frac{1}{4}$ th of male and $\frac{1}{5}$ of female of Indore leave the city and all those who leave Indore came to Delhi & Mumbai in the ratio of 3 : 2 respectively then what is the percent increase of the population in Mumbai.

(a) $33\frac{1}{3}\%$ (b) $11\frac{1}{9}\%$ (c) $12\frac{1}{9}\%$ (d) $16\frac{2}{3}\%$ (e) $8\frac{1}{3}\%$

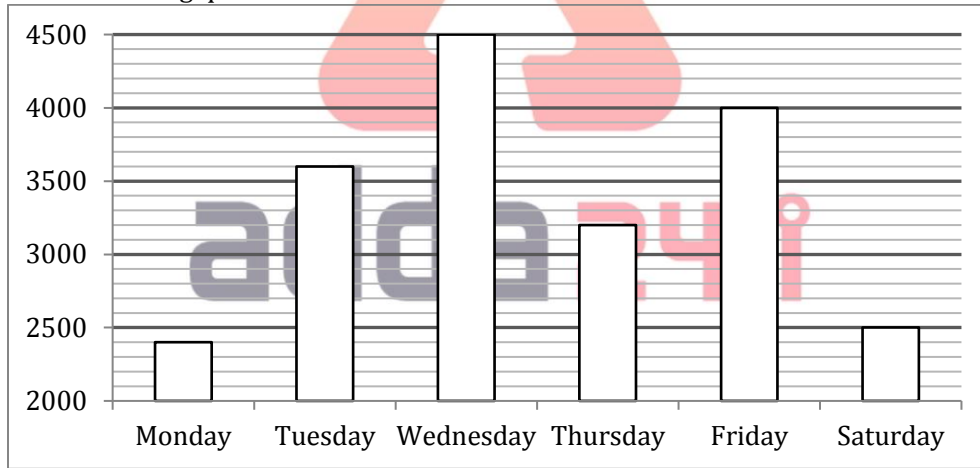
Sol. (b); Total person who leave indore

$$= \frac{1}{4} \times \frac{6}{11} \times 1,10,000 + \frac{1}{5} \times \frac{5}{11} \times 1,10,000 = 25,000$$

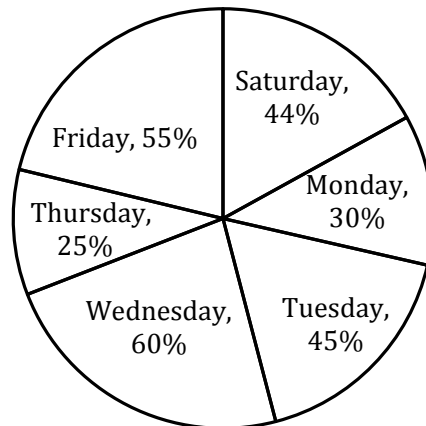
$$\text{Person come to Mumbai} = 25,000 \times \frac{2}{5} = 10,000$$

$$\% \text{ increase of population in Mumbai} = \frac{10,000}{90,000} \times 100 = 11\frac{1}{9}\%$$

Directions (11-15): The following bar graph shows the total number of customers visiting Big Bazar on six different days of a week. And the pie-chart shows the percentage of the females out of the total customers on each day. Read the data carefully and answer the following questions.



Percentage of female customers out of total



11. The number of male customers on Thursday is what percent of the number of female customers on Tuesday?

- (a) $148\frac{1}{9}\%$ (b) $148\frac{4}{27}\%$ (c) $146\frac{4}{27}\%$ (d) $146\frac{1}{9}\%$ (e) $147\frac{2}{27}\%$

Sol. (b): Required % = $\frac{3200 \times \frac{75}{100}}{3600 \times \frac{45}{100}} \times 100$
 $= \frac{4000}{27} \% = 148\frac{4}{27} \%$

12. What is average of the number of male customers on Monday, Wednesday, Friday and Saturday?

- (a) 1670 (b) 1660 (c) 1680 (d) 1684 (e) 1690

Sol. (a): Required average = $\frac{1}{4} \left(2400 \times \frac{70}{100} + 4500 \times \frac{40}{100} + 4000 \times \frac{45}{100} + \frac{2500 \times 56}{100} \right)$
 $= \frac{1}{4} (1680 + 1800 + 1800 + 1400) = 1670$

13. Total number of female customers on Friday and Saturday is approximately what percent more or less than the total number of male customers on Monday and Tuesday?

- (a) 11% (b) 7% (c) 6% (d) 10% (e) 8%

Sol. (d): Required % = $\frac{(2400 \times \frac{70}{100} + 3600 \times \frac{55}{100}) - (4000 \times \frac{55}{100} + \frac{2500 \times 44}{100})}{(2400 \times \frac{70}{100} + 3600 \times \frac{55}{100})} \times 100$
 $= \frac{3660 - 3300}{3660} \times 100 \approx 10\%$

14. Find the difference between the average number of male customers on Tuesday and Friday and the average number of the female customers on Saturday and Wednesday?

- (a) 20 (b) 15 (c) 10 (d) 17 (e) 18

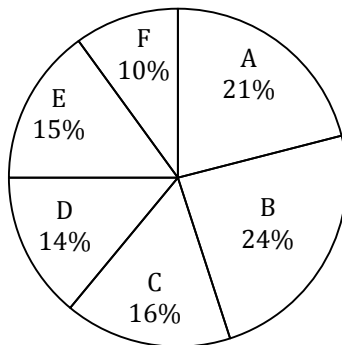
Sol. (c): Required difference = $\frac{1}{2} \left(4500 \times \frac{60}{100} + 2500 \times \frac{44}{100} \right) - \frac{1}{2} \left(3600 \times \frac{55}{100} + \frac{4000 \times 45}{100} \right)$
 $= 1900 - 1890 = 10$

15. Find the ratio of the total number of customers on Monday and Saturday together to the total number of male customers on Friday and Wednesday together?

- (a) 49 : 24 (b) 49 : 30 (c) 49 : 32 (d) 49 : 34 (e) 49 : 36

Sol. (e): Required ratio = $\frac{2400 + 2500}{\left(\frac{40 \times 4500}{100} + 4000 \times \frac{45}{100} \right)} = \frac{4900}{3600} = 49 : 36$

Directions (16-20): The following pie chart shows the distribution of the total population of six cities and the table shows the percentage of adults in these cities and the ratio of males to females among these adult populations. Total population of six cities together is 8.5 lakh.



City	% Adult	Males : Females
A	72	7 : 5
B	65	8 : 5
C	75	3 : 2
D	80	9 : 7
E	70	4 : 3
F	60	7 : 5

16. The number of adults population of City A is how many times the adult population of city D ?

- (a) 0.85 (b) 1.35 (c) 1.75 (d) 1.45 (e) 2

Sol. (b); City D: $\frac{8.5 \times 14 \times 80}{100 \times 100} = \frac{20}{27}$
City A: $\frac{8.5 \times 21 \times 72}{100 \times 100} = \frac{27}{20}$

Required value = $\frac{27}{20} = 1.35$ times

17. What is the difference between total Adult population of cities C and D together and total male (adults) from C, D and F together?

- (a) 52700 (b) 52000 (c) 57000 (d) 52900 (e) 57500

Sol. (a); Required difference = $8.5 \times \left(\frac{16}{100} \times \frac{75}{100} + \frac{14 \times 80}{10000} \right) - 8.5 \left(\frac{16 \times 75 \times 3}{10000 \times 5} + \frac{14 \times 80}{10000} \times \frac{9}{16} + \frac{10 \times 60 \times 7}{10000 \times 12} \right)$
= $85[1200 + 1120] - 85[720 + 630 + 350] = 52700$

18. What is the ratio between the adult females of city A and B together to the adult male population of city D and E together?

- (a) 1 : 2 (b) 1 : 3 (c) 1 : 1 (d) 1 : 4 (e) 2 : 1

Sol. (c); $\frac{8.5 \left[\frac{21 \times 72 \times 5}{10000 \times 12} + \frac{24 \times 65 \times 5}{10000 \times 13} \right]}{8.5 \left[\frac{14 \times 80 \times 9}{10000 \times 16} + \frac{15 \times 70 \times 4}{10000 \times 7} \right]} = \frac{630 + 600}{630 + 600} = 1 : 1$

19. What is difference between total central angle of A, B and F together and C, E and F together ?

- (a) 49.4° (b) 45° (c) 50° (d) 50.4° (e) 50.8°

Sol. (d); A + B + F = $21 + 24 + 10 = 55\%$

C + E + F = $16 + 15 + 10 = 41\%$

Difference = $14\% = 14 \times \frac{18}{5} = 50.4^\circ$

20. If 10% of adults from City A is graduate, then what is the ratio between graduate from City A and adult female population from city B ?

- (a) 25 : 63 (b) 63 : 25 (c) 63 : 29 (d) 29 : 57 (e) 63 : 250

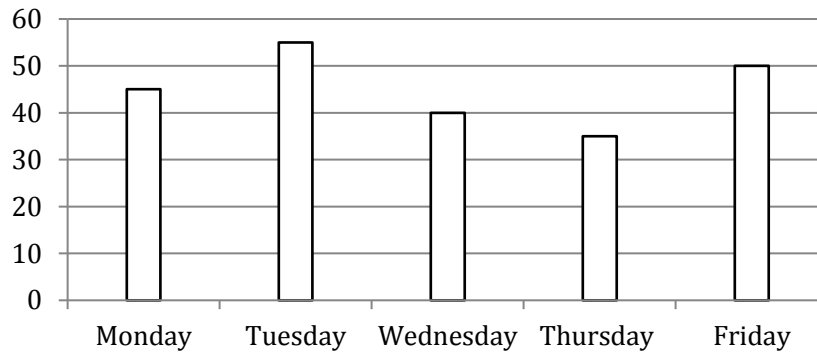
Sol. (e); $\frac{1}{10} \left[\frac{850000 \times 21 \times 72}{100 \times 100} \right] = 12852$ graduates are 10% of Adults from city A

Adult females from B = $\frac{24}{100} \times \frac{65}{100} \times \frac{5}{13} \times 850000$

Ratio = $\frac{85 \times 21 \times 7.2}{24 \times 25 \times 85} = 63 : 250$

Direction (21 – 25): Given below bar graph shows female percentage out of total persons who come to watch movie on five different days of week in multiplex 'XYZ', while table shows number of males come to watch movie on these five days of week. Read the data carefully and answer the questions.

Note – Total people come to watch movie = female come to watch movie + Male come to watch movie.



Days	Male come to watch movie
Monday	176
Tuesday	216
Wednesday	384
Thursday	468
Friday	420

21. Total numbers of female come to watch movie on Friday is how much more than total numbers of female come to watch movie on Tuesday?

- (a) 158 (b) 164 (c) 172 (d) 156 (e) 178

Sol. (d): Total numbers of female come to watch movie on Friday = $420 \times \frac{50}{50} = 420$

Total numbers of female come to watch movie on Tuesday = $216 \times \frac{55}{45} = 264$

Required difference = $420 - 264 = 156$

22. Total people come to watch movie on Saturday is 25% more than total people come to watch movie on Thursday and total male come to watch movie on Saturday is $37\frac{1}{2}\%$ more than total male come to watch movie on Tuesday, then find total female come to watch movie on Saturday?

- (a) 603 (b) 607 (c) 601 (d) 611 (e) 617

Sol. (a): Total people come to watch movie on Saturday = $\frac{468}{65} \times 100 \times \frac{125}{100} = 900$

Total male come to watch movie on Saturday = $216 \times \frac{11}{8} = 297$

So, total female come to watch movie on Saturday = $900 - 297 = 603$

23. Find ratio between total numbers of female come to watch movie on Monday to total numbers of female come to watch movie on Thursday?

- (a) 4 : 9 (b) 4 : 7 (c) 4 : 5 (d) 3 : 7 (e) 3 : 8

Sol. (b): Total numbers of female come to watch movie on Monday = $\frac{176}{55} \times 45 = 144$

Total numbers of female come to watch movie on Thursday = $\frac{468}{65} \times 35 = 252$

Required ratio = $\frac{144}{252} = 4 : 7$

24. If ratio between total people come to watch movie on Sunday to total female come to watch movie on Friday 5 : 3 and out of total people come to watch movie on Sunday 30% are female, then find total male on Sunday is what percent of total male come to watch movie on Tuesday & Wednesday together?

- (a) $79\frac{2}{3}\%$ (b) $77\frac{2}{9}\%$ (c) $75\frac{2}{3}\%$ (d) $81\frac{2}{3}\%$ (e) $78\frac{2}{3}\%$

Sol. (d): Total female come to watch movie on Friday = $420 \times \frac{50}{50} = 420$

So, total people come to watch movie on Sunday = $420 \times \frac{5}{3} = 700$

Total male come to watch movie on Sunday = $700 \times \frac{70}{100} = 490$

Required percentage = $\frac{490}{(216+384)} \times 100 = 81\frac{2}{3}\%$

25. Find total number of females who come to watch movie on Tuesday, Wednesday & Friday together?

- (a) 920 (b) 960 (c) 940 (d) 910 (e) 840

Sol. (c): Total number of females come to watch movie on Tuesday = $216 \times \frac{55}{45} = 264$

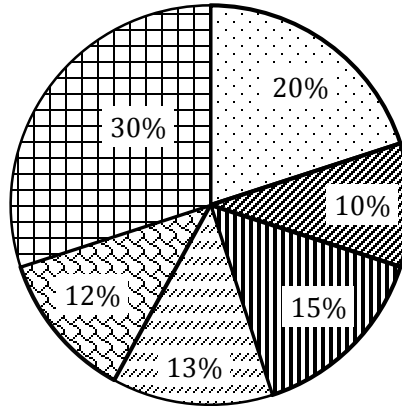
Total number of females come to watch movie on Wednesday = $\frac{384}{60} \times 40 = 256$

Total number of females come to watch movie on Friday = $420 \times \frac{50}{50} = 420$

Required sum = $264 + 256 + 420 = 940$

Directions (26-30):- Pie chart given below gives information about total no. of students who appeared in six different exams i.e. railway, ctet, cgl, chsl, cpo and banking exams and table given below gives ratio of students belonging to general,

obc and other category out of who have appeared in exam. If 50000 students applied for exam and only 60% appeared in exams.



railway
 ctet
 cgl
 chsl
 cpo
 banking

Name of exams	General : obc : other category
Railway	5:8:7
Ctet	6:4:5
Cgl	5:6:7
Chsl	4:7:2
Cpo	7:8:5
Banking	15:10:11

26. In banking exams total 1330 students have passed and from general and obc category 20% and 10% of the students were able to pass the exams respectively. Find what percent students of other category passed the banking sector exam.
 (a) 22% (b) 14% (c) 11% (d) 12% (e) 9%
27. What is the ratio of students belonging to general category and appeared in cgl exam to students belonging to other category and appeared in cpo exam?
 (a) 25:13 (b) 25:18 (c) 18:13 (d) 28:19 (e) 19:18
28. What is the average of total no. student belonging to obc category who appeared in all exam?
 (a) 1790 (b) 1793 (c) 1795 (d) 1800 (e) 1805
29. If no. of students appeared in banking exam from general category is 15% of total students applied for all the exams from urban area, then find no. of students applied for all the exams belonging to rural area?
 (a) 5000 (b) 30000 (c) 15000 (d) 10000 (e) 25000
30. Total no. of students appeared in railway exam are what part of total students who did not appear in any exam.
 (a) 40% (b) 30% (c) 50% (d) 20% (e) 25%

Sol. (26-30): Total students appeared in all exams = $50000 \times \frac{60}{100} = 30000$

Total Students appeared in railway exams = $30000 \times \frac{20}{100} = 6000$

Total Students appeared in ctet exams = $30000 \times \frac{10}{100} = 3000$

Total Students appeared in cgl exams = $30000 \times \frac{15}{100} = 4500$

Total Students appeared in chsl exams = $30000 \times \frac{13}{100} = 3900$

Total Students appeared in cpo exams = $30000 \times \frac{12}{100} = 3600$

Total Students appeared in banking exams = $30000 \times \frac{30}{100} = 9000$

S26. (d): students passed from general category in banking = $9000 \times \frac{15}{36} \times \frac{20}{100} = 750$
 students passed from obc category in banking = $9000 \times \frac{10}{36} \times \frac{10}{100} = 250$
 students passed from other category in banking = $1330 - 750 - 250 = 330$
 required percentage = $\frac{330}{9000 \times \frac{11}{36}} \times 100 = 12\%$

S27. (b): no. of students appeared in cgl exam from general category = $4500 \times \frac{5}{18} = 1250$
 no. of students appeared in cpo exam from other category = $3600 \times \frac{5}{20} = 900$
 required ratio = 1250: 900
 = 25: 18

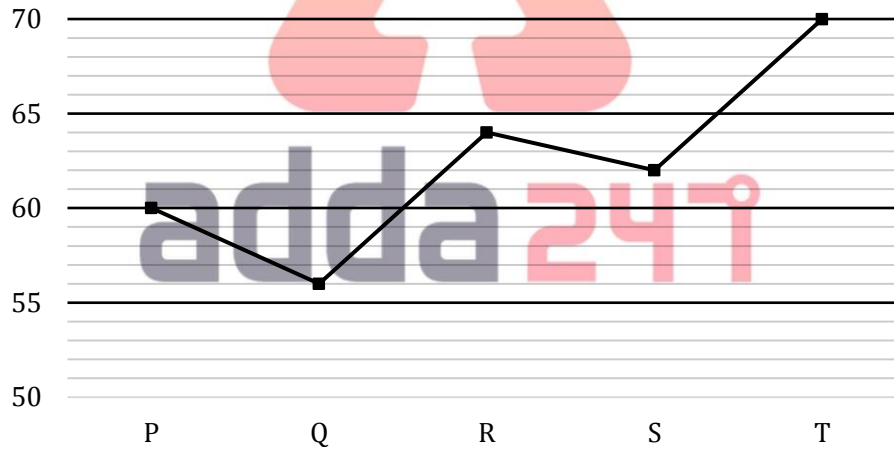
S28. (a): total no. of students belonging to obc who appeared in all exam
 $6000 \times \frac{8}{20} + 3000 \times \frac{4}{15} + 4500 \times \frac{6}{18} + 3900 \times \frac{7}{13} + 3600 \times \frac{8}{20} + 9000 \times \frac{10}{36} = 10740$
 Required average = $\frac{10740}{6} = 1790$

S29. (e): Total no. of students belonging to general category and appeared in banking exam = $9000 \times \frac{15}{36} = 3750$
 Total no. of students applied for all the exams belonging to rural area = $50000 - \frac{3750}{15} \times 100 = 25000$

S30. (b): required percentage = $\frac{6000}{50000 - 30000} \times 100 = 30\%$

Direction (31 -35): Line graph given below shows percentage of students who like PUBG in five different colleges and table shows difference between students who like PUBG and 'Counter strike' in these five colleges. Each of the students in these colleges likes only one of these two games. Read the data carefully and answer the question.

NOTE:- Students in each college either like PUBG or Counter Strike



Colleges	Difference between students who like PUBG and 'Counter strike'
P	400
Q	180
R	672
S	720
T	1440

31. Find total number of students in the colleges P & T together?

- (a) 5600 (b) 5400 (c) 5200 (d) 5000 (e) 4800

Sol. (a): Total students in P = $400 \times \frac{100}{(60-40)} = 2000$
 Total students in T = $1440 \times \frac{100}{(70-30)} = 3600$
 Required sum = $2000 + 3600 = 5600$

32. Total students who like 'Counter strike' in Q are what percent less than total students who like same game in R?

- (a) $23\frac{13}{18}\%$ (b) $23\frac{11}{18}\%$ (c) $25\frac{11}{18}\%$ (d) $27\frac{11}{18}\%$ (e) None of these

Sol. (b): Total students who like 'Counter strike' in Q = $180 \times \frac{44}{(56-44)} = 660$
 Total students who like 'Counter strike' in R = $672 \times \frac{36}{(64-36)} = 864$

$$\text{Required percentage} = \frac{864-660}{864} \times 100$$

$$= \frac{204}{864} \times 100 = 23\frac{11}{18}\%$$

33. Find average number of students in R, S & T?

- (a) 2800 (b) 3200 (c) 3600 (d) 3000 (e) 3400

Sol. (d): Total students in R = $672 \times \frac{100}{(64-36)} = 2400$
 Total students in S = $720 \times \frac{100}{(62-38)} = 3000$
 Total students in T = $1440 \times \frac{100}{(70-30)} = 3600$
 Required average = $\frac{(2400+3000+3600)}{3} = 3000$

34. Find the ratio of students who like PUBG in P to that of in T?

- (a) 10 : 23 (b) 10 : 19 (c) 10 : 17 (d) 10 : 13 (e) 10 : 21

Sol. (e): Total students who like PUBG in P = $400 \times \frac{60}{(60-40)} = 1200$
 Total students who like PUBG in T = $1440 \times \frac{70}{(70-30)} = 2520$
 Required ratio = $\frac{1200}{2520} = 10 : 21$

35. Total students in P & Q together are what percent more than total students in S?

- (a) $12\frac{1}{2}\%$ (b) 14% (c) $16\frac{2}{3}\%$ (d) $16\frac{1}{3}\%$ (e) 15%

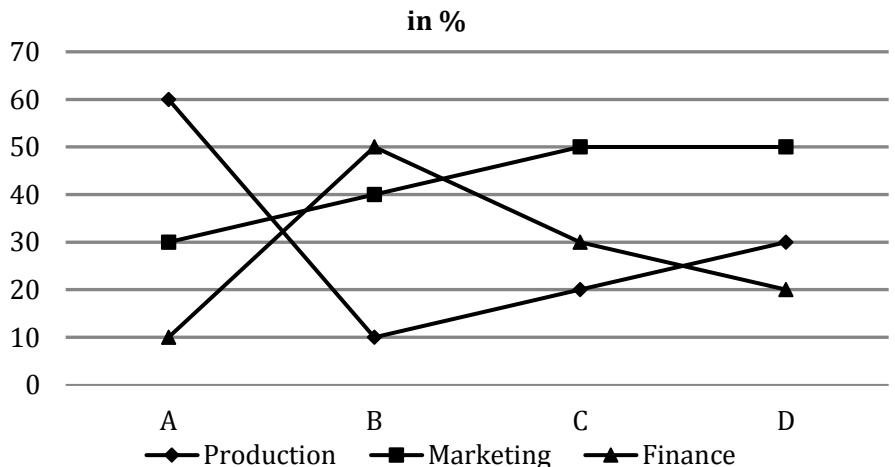
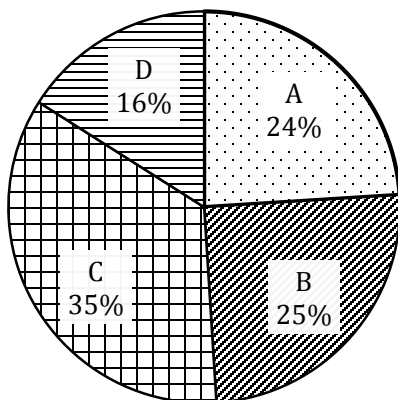
Sol. (c): Total students in P = $400 \times \frac{100}{(60-40)} = 2000$
 Total students in Q = $180 \times \frac{100}{(56-44)} = 1500$
 Total students in S = $720 \times \frac{100}{(62-38)} = 3000$
 Required percentage = $\frac{3500-3000}{3000} \times 100 = 16\frac{2}{3}\%$

Directions (36-40): Study the charts given below and answer the following questions.

Pie chart shows the % distribution of total employees of four companies (A, B, C & D) and line chart shows the % distribution of employees of each company in three different departments (i.e., Production, Finance and Marketing).

Total employees = 10000

■ A ■ B ■ C ■ D



- 36.** Find ratio of employees of company-A in production & marketing department together to employees of company-B in Finance department and employees of company-C in marketing department together.
 (a) 18 : 25 (b) 4 : 5 (c) 11 : 14 (d) 12 : 17 (e) 20 : 27
- Sol. (a):** Employees of company – A in marketing & production department together

$$= 10000 \times \frac{24}{100} \times \frac{(60 + 30)}{100} = 2160$$
 Employees of company – B in Finance department = $10000 \times \frac{25}{100} \times \frac{50}{100} = 1250$
 Employees of company – C in marketing department = $10000 \times \frac{35}{100} \times \frac{50}{100} = 1750$
 Required ratio = $\frac{2160}{(1250 + 1750)} = 18 : 25$
- 37.** Employees in finance department of company-A and employees in production department of company-B together are what percent of employees in marketing department of company-B?
 (a) 45% (b) 42% (c) 58% (d) 49% (e) 53%
- Sol. (d):** Employees in finance department of company – A = $10000 \times \frac{24}{100} \times \frac{10}{100} = 240$
 Employees in production department of company – B = $10000 \times \frac{25}{100} \times \frac{10}{100} = 250$
 Employees in marketing department of company – B = $10000 \times \frac{25}{100} \times \frac{40}{100} = 1000$
 Required% = $\frac{240 + 250}{1000} \times 100 = 49\%$
- 38.** If ratio of male to female employees in company-A, B & C is 2 : 3, 11 : 9 and 4 : 1 respectively, then find approximate average number of male employees in company-A, B & C.
 (a) 1706 (b) 1728 (c) 1684 (d) 1712 (e) 1738
- Sol. (d):** ATQ,
 Average number of male employees in company A, B & C

$$\frac{1}{3} \left[10000 \times \frac{24}{100} \times \frac{2}{5} + 10000 \times \frac{25}{100} \times \frac{11}{20} + 10000 \times \frac{35}{100} \times \frac{4}{5} \right]$$

$$= \frac{1}{3} [960 + 1375 + 2800] = \frac{1}{3} \times 5135$$

$$= \frac{5135}{3}$$

$$= 1711.67 = 1712 \text{ (approx.)}$$
- 39.** Find total number of employees in production department of company-C & D together.
 (a) 1320 (b) 1180 (c) 1250 (d) 1220 (e) 1160
- Sol. (b):** Required number of employees = $\left[10000 \times \frac{35}{100} \times \frac{20}{100} + 10000 \times \frac{16}{100} \times \frac{30}{100} \right]$

$$= 700 + 480 = 1180$$
- 40.** Average number of employees in finance department of company-C & D is what percent more or less than employees in production department of company-B?
 (a) 172% (b) 164% (c) 168% (d) 160% (e) None of the above.
- Sol. (e):** Average number of employees in finance department of company – C & D

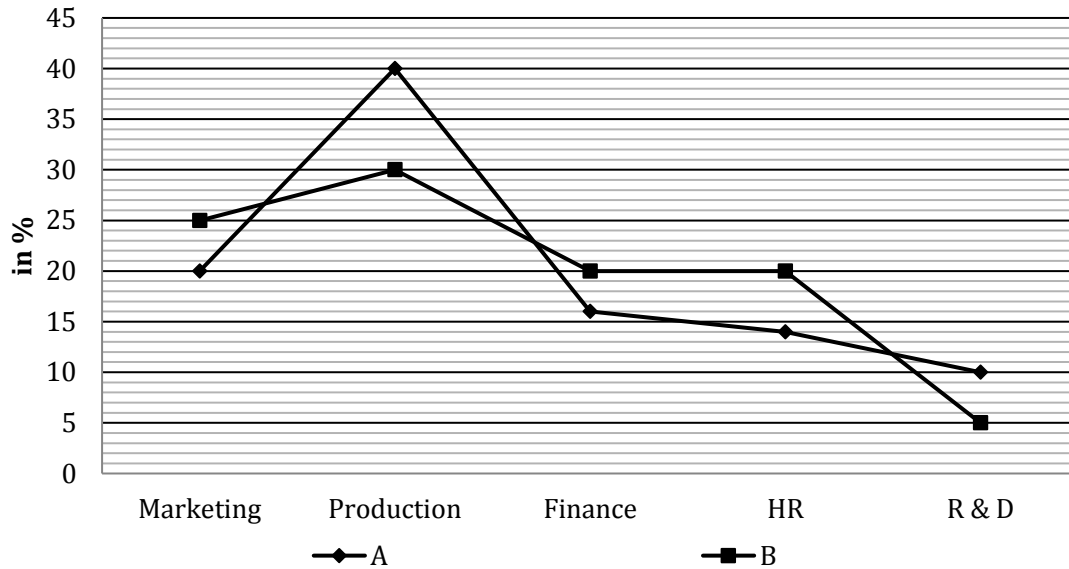
$$= \frac{1}{2} \left[10000 \times \frac{35}{100} \times \frac{30}{100} + 10000 \times \frac{16}{100} \times \frac{20}{100} \right]$$

$$= \frac{1}{2} [1050 + 320] = 685$$
 Employees in production department of company – B = $10000 \times \frac{25}{100} \times \frac{10}{100} = 250$
 Required% = $\frac{685 - 250}{250} \times 100$

$$= \frac{435 \times 2}{5} = 174\%$$

Directions (41-45): Study the charts given below and answer the following questions.

Line chart shows the percentage distribution of employees of company – A & B in 5 different departments (i.e. Marketing, Production, Finance, HR and R & D) and table shows the ratio of male and female employees of these 2 companies in these 5 departments. Total employees in company – A & B are 5000 and 8000 respectively.



Departments	A (Male : Female)	B (Male : Female)
Marketing	11 : 9	18 : 7
Production	3 : 2	2 : 1
Finance	7 : 3	3 : 2
HR	2 : 3	1 : 4
R & D	13 : 12	1 : 1

- 41.** Number of male employees in marketing and finance department of company-B together are what percent of number of employees in production department of company-A?

(a) 130% (b) 110% (c) 140% (d) 120% (e) 150%

Sol. (d): Number of male employees in marketing and finance department of company – B together

$$= 8000 \times \left[\frac{25}{100} \times \frac{18}{25} + \frac{20}{100} \times \frac{3}{5} \right] = 8000 \times \frac{3}{10} = 2400$$

$$\text{Number of employees in production department of company – A} = 5000 \times \frac{40}{100} = 2000$$

$$\text{Required \%} = \frac{2400}{2000} \times 100 = 120\%$$

- 42.** Find average number of female employees in Finance, HR and R&D department of company-A are how much more or less than number of male employees in HR department of company-B?

(a) 10 (b) 80 (c) 20 (d) 50 (e) 70

Sol. (c): Average number of female employees in Finance, HR and R & D department of company

$$- A = \frac{1}{3} \times 5000 \left[\frac{16}{100} \times \frac{3}{10} + \frac{14}{100} \times \frac{3}{5} + \frac{10}{100} \times \frac{12}{25} \right]$$

$$= \frac{5000}{3} \left[\frac{48}{1000} + \frac{42}{500} + \frac{12}{250} \right] = \frac{5000}{3} \times \frac{180}{1000} = 300$$

$$\text{Male employees in HR department of company – B} = 8000 \times \frac{20}{100} \times \frac{1}{5} = 320$$

$$\text{Required difference} = 320 - 300 = 20$$

- 43.** Find ratio of number of male employees in Production and R&D department of company-B together to number of male employees in HR and R&D department of company-A together.

(a) 10 : 3 (b) 13 : 7 (c) 5 : 2 (d) 6 : 1 (e) 13 : 9

Sol. (a): Numbers of male employees in Production and R & D department of company

$$- B \text{ together} = 8000 \times \left[\frac{30}{100} \times \frac{2}{3} + \frac{5}{100} \times \frac{1}{2} \right] = 1800$$

Numbers of male employees in HR and R & D department of company – A together

$$= 5000 \times \left[\frac{14}{100} \times \frac{2}{5} + \frac{10}{100} \times \frac{13}{25} \right] = 540$$

$$\text{Required ratio} = \frac{1800}{540} = \frac{10}{3} = 10 : 3$$

44. Female employees in Marketing and Finance department of company-B together are what percent more or less than female employees in Marketing and Production department of company-A together?

- (a) 25% (b) 12% (c) 4% (d) 9% (e) 16%

Sol. (c): Female employees in Marketing and Finance department of company – B together

$$= 8000 \times \left[\frac{25}{100} \times \frac{7}{25} + \frac{20}{100} \times \frac{2}{5} \right] = 1200$$

Female employees in Marketing and Production department of company – A together

$$= 5000 \times \left[\frac{20}{100} \times \frac{9}{20} + \frac{40}{100} \times \frac{2}{5} \right] = 1250$$

$$\text{Required \%} = \frac{1250 - 1200}{1250} \times 100 = 4\%$$

45. Male employees in Marketing, Production and Finance department of company-A together are how much more or less than female employees in Production, HR and R&D department of company-B together?

- (a) 30 (b) 70 (c) 40 (d) 50 (e) 60

Sol. (a): Male employees in Marketing, Production and Finance department of company

$$- A \text{ together} = 5000 \times \left[\frac{20}{100} \times \frac{11}{20} + \frac{40}{100} \times \frac{3}{5} + \frac{16}{100} \times \frac{7}{10} \right]$$

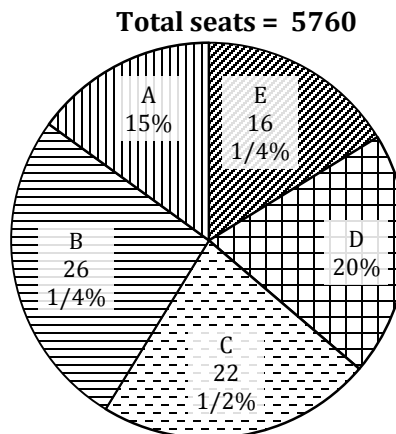
$$= 5000 \times \frac{462}{1000} = 2310$$

Female employees in Production, HR and R & D department of company – B together

$$= 8000 \times \left[\frac{30}{100} \times \frac{1}{3} + \frac{20}{100} \times \frac{4}{5} + \frac{5}{100} \times \frac{1}{2} \right] = 8000 \times \frac{57}{200} = 2280$$

$$\text{Required difference} = 2310 - 2280 = 30$$

Direction (46 – 50): Given below pie chart shows percentage distribution of total number of seats available in five different colleges (E, D, C, B & A), while information about number of seats available in four different streams (IT, CS, Mechanical & Electrical) in each college is given in following paragraph. Read the data carefully and answer the questions.



College A– Total number of seats in IT is $\frac{3}{8}$ th of total seats available in the college, while 50% of remaining seats available for CS stream. Ratio of seats available for Mechanical & Electrical is 5 : 4.

College B – Total number of seats in IT stream is $\frac{11}{36}$ th of total seats available in the college, 40% of remaining seats available for CS stream and total number of seats for Mechanical stream is 10% more than total seats available for Electrical.

College C – 25% of total seats available for IT and ratio of total seats in CS, Mechanical & Electrical is 4 : 3 : 5.

College D – $\frac{7}{16}$ th of total seats available for IT and $33\frac{1}{3}\%$ of remaining seats available for CS. Total seats available for Mechanical are 16% more than total seats for Electrical.

College E – Total seats available for IT are 348 less than total seats available for same stream in college D, 25% of remaining seats available for CS. Total seats available for Electrical are 60% more than total seats available for Mechanical.

46. Find the ratio between total Mechanical seats in all the five colleges to total Electrical seats in the college B, C & D together?

- (a) 240 : 187 (b) 42 : 31 (c) 233 : 180 (d) 236 : 181 (e) 59 : 45

47. Total CS seats in the college A & B together is what percent more or less than total IT seats in the college D & E together?

- (a) $4\frac{6}{11}\%$ (b) $6\frac{4}{11}\%$ (c) 5% (d) $3\frac{2}{11}\%$ (e) $5\frac{5}{11}\%$

48. Find the difference between total IT seats in the college A, B & C together and total CS seats in college C, D & E together?

- (a) 381 (b) 388 (c) 375 (d) 368 (e) 370

49. Find the average number of Mechanical seats in the college A, B & C?

- (a) 256 (b) 266 (c) 264 (d) 280 (e) 241

50. Total electrical seats in the college A & B together is what percent more than total Electrical seats in the college E?

- (a) $14\frac{2}{3}\%$ (b) $16\frac{2}{3}\%$ (c) $12\frac{2}{3}\%$ (d) 10% (e) $12\frac{1}{2}\%$

Sol. (46 – 50):

$$\text{Total seats in college E} = 5760 \times \frac{65}{4} \times \frac{1}{100} = 936$$

$$\text{Total seats in college D} = 5760 \times \frac{20}{100} = 1152$$

$$\text{Total seats in college C} = 5760 \times \frac{45}{2} \times \frac{1}{100} = 1296$$

$$\text{Total seats in college B} = 5760 \times \frac{105}{4} \times \frac{1}{100} = 1512$$

$$\text{Total seats in college A} = 5760 \times \frac{15}{100} = 864$$

College A – Total seats available for IT = $864 \times \frac{3}{8} = 324$

$$\text{Total seats available for CS} = (864 - 324) \times \frac{1}{2} = 270$$

$$\text{Total seats available for Mechanical} = (864 - 324 - 270) \times \frac{5}{9} = 150$$

$$\text{Total seats available for Electrical} = (864 - 324 - 270) \times \frac{4}{9} = 120$$

College B – Total seats available for IT = $1512 \times \frac{11}{36} = 462$

$$\text{Total seats available for CS} = (1512 - 462) \times \frac{40}{100} = 420$$

Let total seats available for Electrical = 100x

So, total seats available for Mechanical = 110x

$$\text{Total seats available for Mechanical} = (1512 - 462 - 420) \times \frac{110x}{210x} = 330$$

$$\text{Total seats available for Electrical} = (1512 - 462 - 420) \times \frac{100x}{210x} = 300$$

College C – Total seats available for IT = $1296 \times \frac{1}{4} = 324$

$$\text{Total seats available for CS} = (1296 - 324) \times \frac{4}{12} = 324$$

$$\text{Total seats available for Mechanical} = (1296 - 324) \times \frac{3}{12} = 243$$

$$\text{Total seats available for Electrical} = (1296 - 324) \times \frac{5}{12} = 405$$

College D – Total seats available for IT = $1152 \times \frac{7}{16} = 504$

$$\text{Total seats available for CS} = (1152 - 504) \times \frac{1}{3} = 216$$

Let total seats available for Electrical = 100x

So, total seats available for Mechanical = 116x

Total seats available for Mechanical = $(648-216) \times \frac{116x}{216x} = 232$

Total seats available for Electrical = 200

College E – Total seats available for IT = $504 - 348 = 156$

Total seats available for CS = $(936 - 156) \times \frac{1}{4} = 195$

Let total seats available for Mechanical = $100x$

So, total seats available for Electrical = $160x$

Total seats available for Electrical = $(936 - 156 - 195) \times \frac{160x}{260x} = 360$

Total seats available for Mechanical = $(936 - 156 - 195) \times \frac{100x}{260x} = 225$

Streams	A	B	C	D	E
IT	324	462	324	504	156
CS	270	420	324	216	195
Mechanical	150	330	243	232	225
Electrical	120	300	405	200	360
Total	864	1512	1296	1152	936

S46. (d): Total Mechanical seats in the all five colleges = $150 + 330 + 243 + 232 + 225 = 1180$

Total Electrical seats in collage B, C & D = $300 + 405 + 200 = 905$

Required ratio = $\frac{1180}{905} = 236 : 181$

S47. (a): Total CS seats in A & B = $270 + 420 = 690$

Total IT seats in D & E = $504 + 156 = 660$

Required percentage = $\frac{690-660}{660} \times 100 = 4\frac{6}{11}\%$

S48. (c): Total IT seats in the college A, B & C = $324 + 462 + 324 = 1110$

Total CS seats in the college C, D & E = $324 + 216 + 195 = 735$

Required difference = $1110 - 735 = 375$

S49. (e): Total Mechanical seats in the college A, B & C = $150 + 330 + 243 = 723$

Required average = $\frac{723}{3} = 241$

S50. (b): Total electrical seats in the college A & B = $120 + 300 = 420$

Required percentage = $\frac{420-360}{360} \times 100 = 16\frac{2}{3}\%$

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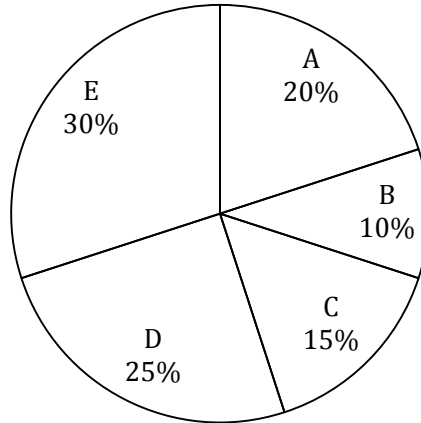


From Star faculties of Bankersadda

Practice MCQs for Prelims

Directions (1-5): Given pie chart shows the percentage distribution of production of bags by 5 different companies while the table shows the data of ratio of duffel bags to backpacks produced by these 5 companies. Study the charts carefully and answer the questions.

Total bags produced = 1000



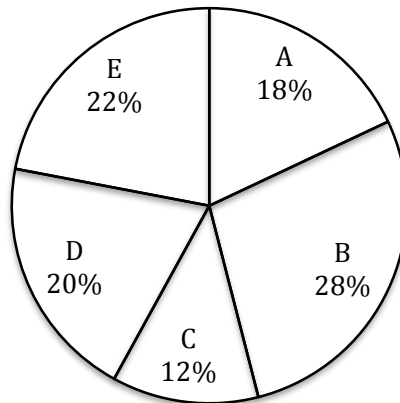
Companies	Duffel Bags : Backpacks
A	1 : 1
B	3 : 2
C	8 : 7
D	12 : 13
E	13 : 17

- How many bags (duffel) were produced by companies B and C together?
 (a) 160 (b) 130 (c) 150 (d) 140 (e) 120
- What is ratio of backpacks produced by company A & D together to duffel bags produced by company E?
 (a) 22 : 17 (b) 13 : 23 (c) 23 : 13 (d) 17 : 22 (e) 23 : 17
- Duffel bags produced by company B are what percent of backpacks produced by company D?
 (a) $46\frac{2}{13}\%$ (b) $48\frac{2}{13}\%$ (c) $44\frac{2}{13}\%$ (d) $50\frac{2}{13}\%$ (e) None of the above
- What is average of backpacks produced by company C and D together?
 (a) 110 (b) 140 (c) 80 (d) 120 (e) 100
- Total bags produced by company B and E together are what percent of duffel bags produced by company A, D & E together?
 (a) $112\frac{2}{7}\%$ (b) $114\frac{2}{7}\%$ (c) $110\frac{2}{7}\%$ (d) $116\frac{2}{7}\%$ (e) $118\frac{2}{7}\%$

Directions (6-10): Study the charts given below carefully and answer the following questions.

Pie chart shows the percentage distribution of total employee in 5 different companies as shown below and table shown below shows the ratio of males to females in these 5 companies.

Total employee = 5400

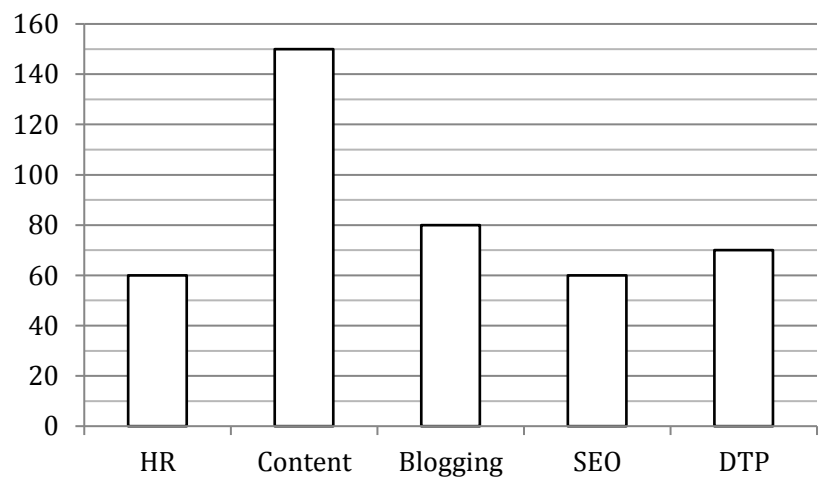
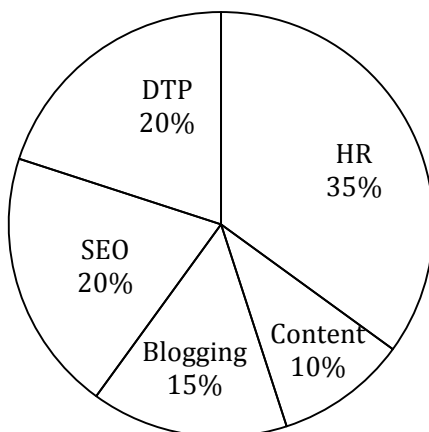


	Ratio of total males to females(M: F)
A	2:1
B	3:1
C	1:2
D	2:3
E	2:1

6. What is the ratio of number of males in company E to the number of females in company D?
 (a) 7: 11 (b) 9:11 (c) 11:9 (d) 11: 7 (e) 7:13
7. Total number of males in company A are approximately what percent of total females in company E?
 (a) 164% (b) 152% (c) 170% (d) 144% (e) 138%
8. Total males in B, C & D together are what percent of total employees in all 5 companies together?
 (a) 38% (b) 33% (c) 45% (d) 48% (e) 52%
9. How many females employee are there in all the 5 companies together?
 (a) 2084 (b) 2304 (c) 2256 (d) 2178 (e) 2280
10. Find the central angle of total employees from companies B and D together?
 (a) 151.2° (b) 162° (c) 165.6° (d) 187.2° (e) 172.8°

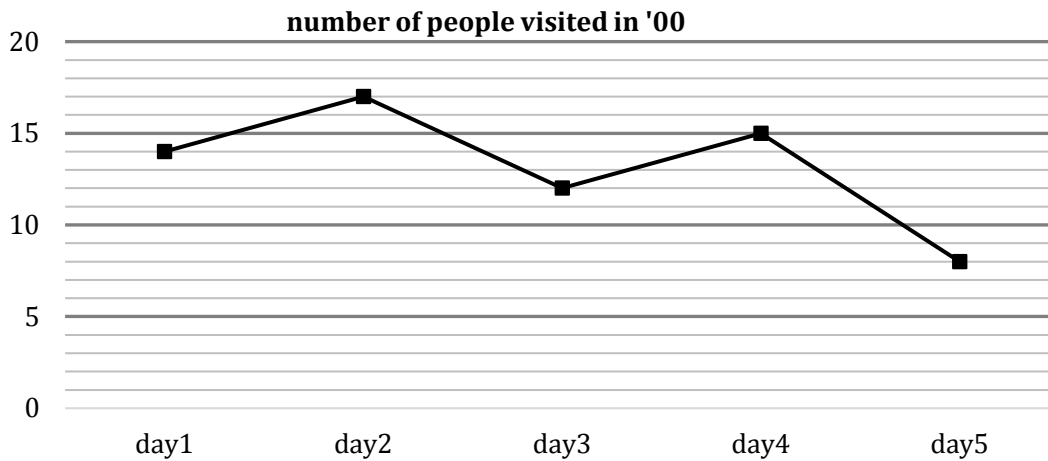
Directions (11-15): Given pie chart shows the percentage distribution of incentive received by various employees of different departments in a company. The table shows the data of number of employees in various employees of the company. Study the charts carefully and answer the questions.

Total Incentive = Rs 50000



11. What incentive is given to each employee of HR department?
 (a) Rs 291.67 (b) Rs 300 (c) Rs 294.33 (d) Rs 297.67 (e) Rs 287
12. What is ratio of per head incentive given to employees of Blogging department to that of SEO department?
 (a) 3 : 4 (b) 4 : 3 (c) 9 : 16 (d) 16 : 9 (e) 1 : 1
13. What is average of incentive given to employees of Content, SEO & DTP department?
 (a) 8444 (b) 8333.33 (c) 8250 (d) 8367.67 (e) None of the above
14. Per employee incentive given to Content department is what percent less than per employee incentive given to HR department? (approx)
 (a) 95% (b) 93% (c) 83% (d) 85% (e) 89%
15. Which department has received maximum incentive per employee?
 (a) Content (b) HR (c) DTP (d) Blogging (e) SEO

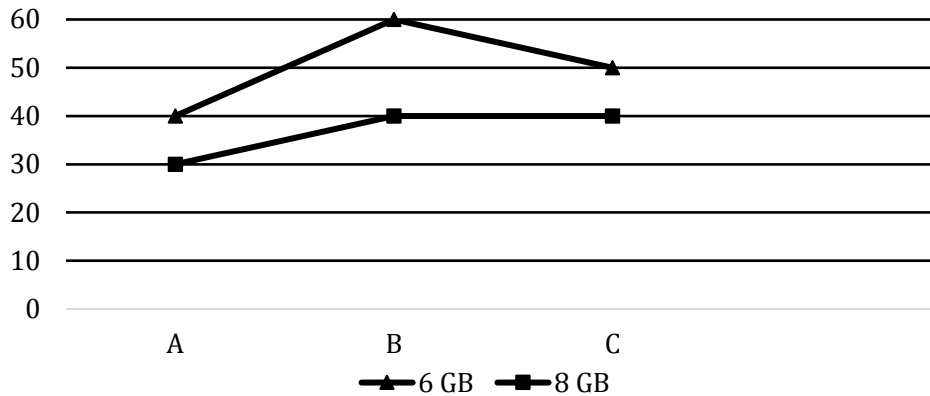
Directions (16-20): line chart given below gives information about total number of people in ('00) who visited statue of liberty in five days of week and table given tells about ratio of male to female who visited statue of liberty in these five days.



Days	Male : female
Day1	13:15
Day2	37:31
Day3	13:12
Day4	7:8
Day5	11:5

16. Maximum no. of male is how much percent more than minimum number of females who visited statue of liberty in any day of the week?
 (a) 150% (b) 270% (c) 125% (d) 200% (e) 185%
17. In how many days of the week, number of people is less than average no. of people who visited statue of liberty?
 (a) 5 (b) 4 (c) 3(d) 1 (e) 2
18. What is the square root of number of females who visited on day3 of the week?
 (a) 26 (b) 22 (c) 24 (d) 18 (e) None of these.
19. What is the ratio of average number of females who visited on day1, day2 and day4 to average number of males who visited on day2 and day4?
 (a) 65:62 (b) 63:62 (c) 62:65 (d) 62:61 (e) 63:65
20. If 4% of number of males visited on day1 were also come on day3 and ratio of male and female remain unchanged, then find increase in number of females who visited on day3?
 (a) 26 (b) 24 (c) 12 (d) 13 (e) 39

Direction (21 – 25): Line graph shows total number (in hundred) of 6GB & 8GB mobile manufactured by three companies and table shows percentage of (6GB + 8GB) mobiles sold by these three companies. Read the data carefully and answer the question.

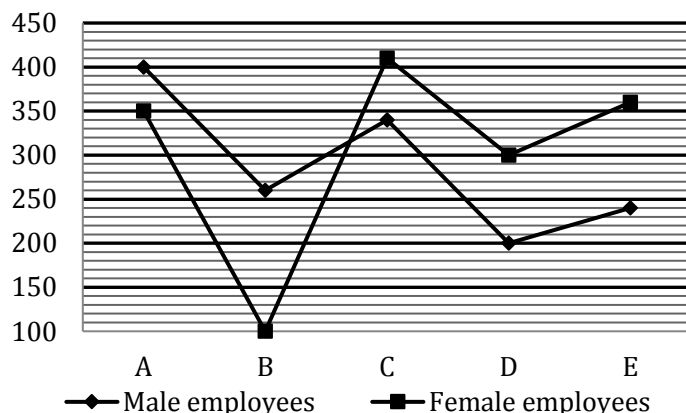


Companies	% of sold mobiles
A	40%
B	80%
C	60%

21. If A & B sold 45% and $66\frac{2}{3}\%$ of total 6GB mobile phones manufactured by them respectively, then find total 8 GB mobile phones sold by these two companies are what percent of total mobiles manufactured by B?
 (a) 50% (b) 40% (c) 45% (d) 60% (e) 30%
22. Average of total unsold mobiles by B & C together is how much more or less than total sold mobiles by C?
 (a) 2400 (b) 2800 (c) 2600 (d) 3200 (e) 3600
23. If ratio of total 6GB to 8 GB mobiles sold by A & C is 5 : 2 and 5 : 4 respectively, then find total 8 GB mobiles sold by these two companies?
 (a) 3600 (b) 3000 (c) 4000 (d) 3200 (e) 4200
24. Total unsold mobiles by A is what percent more than that of by B?
 (a) 110% (b) 120% (c) 130% (d) 105% (e) 100%
25. Find average number of mobiles sold by all three companies?
 (a) 5200 (b) 5800 (c) 4800 (d) 5400 (e) 5600

Directions (26-30): Study the line chart and table given carefully and answer the following questions.

Line chart gives information about male and female employees in 5 different companies (A, B, C, D & E) and table shows percentage of employees (male + female) promoted in these 5 companies.



Company	% of employees promoted
A	40%
B	80%
C	60%
D	80%
E	50%

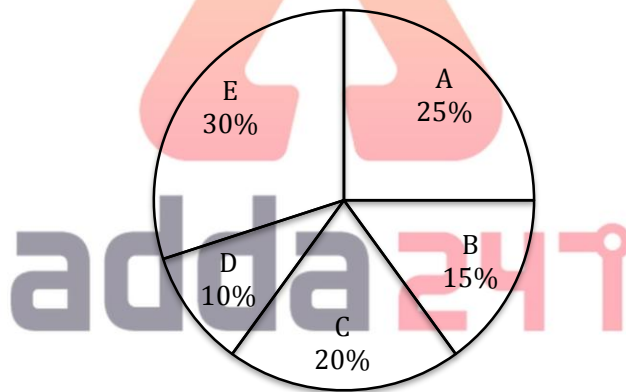
Note – Total employees in a company = Total (male + female) employees in that company.

26. If ratio of male to female employees who are promoted in A is 2 : 3 and male employees who are promoted in B are 100% more than male employees who are promoted in A, then find number of female employees who are not promoted in A & B together.
 (a) 256 (b) 218 (c) 222 (d) 206 (e) 184
27. Find ratio of promoted employees in C & E together to average number of employees in A & D.
 (a) 6 : 5 (b) 3 : 2 (c) 9 : 7 (d) 11 : 5 (e) 5 : 2
28. If male employees who are promoted in E are equal to male employees in D and female employees who are promoted in C are 60% more than that of in E, then find male employees who are promoted in C & E together are what percent of total employees in D?
 (a) 92% (b) 87% (c) 98% (d) 80% (e) 82%
29. Employees who are promoted in A, B & D together are how much more or less than female employees in B, C & D together?
 (a) 196 (b) 172 (c) 190 (d) 184 (e) 178
30. If age of 21% of the promoted employees in E is more than 50 years, then find promoted employees in E whose age is less than or equal to 50 years are what percent less than male employees in B & E together?
 (a) 64.6% (b) 52.6% (c) 60.6% (d) 68.6% (e) 65.6%

Directions (31-36): Study the charts given below carefully and answer the following questions.

Pie chart shows the percentage distribution of total fans manufactured by 5 different fan manufacturers (A, B, C, D & E) and table shows the defective fans manufactured by these 5 companies.

Total fans manufactured = 20,000



Company	Defective fans
A	500
B	600
C	800
D	500
E	900

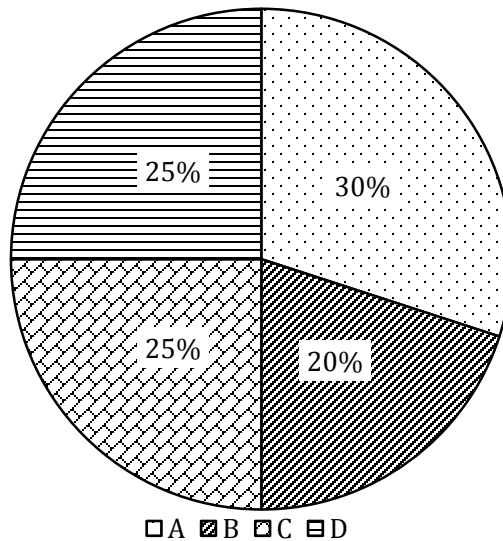
Note – Total fans manufactured by any company = Total (defective + non-defective) fans manufactured by that company.

31. Non – defective fans manufactured by A are what percent more or less than total fans manufactured by C?
 (a) 24.5% (b) 12.5% (c) 19.5% (d) 27.5% (e) 32.5%
32. Non – defective fans manufactured by E are how much more than defective fans manufactured by A, B & C together?
 (a) 3600 (b) 2800 (c) 2500 (d) 3700 (e) 3200
33. If cost of manufacturing a fan for D is Rs.100 and D wants to earn 20% profit on the total cost of manufacturing and D does not sell defective fans, then find at what price D should sell all the non-defective fans.
 (a) Rs.160 (b) Rs.156 (c) Rs.145 (d) Rs.148 (e) Rs.154

34. Find the central angle (in degrees) of total fans manufactured by A & C together.
 (a) 144 (b) 150 (c) 180 (d) 162 (e) 200
35. If E also manufactures coolers and ratio of fans to coolers manufactured by E is 5 : 7, then find coolers manufactured by E are how much more than non-defective fans manufactured by C?
 (a) 5200 (b) 4600 (c) 4800 (d) 5400 (e) 5000
36. Find ratio of defective fans manufactured by E to non-defective fans manufactured by B.
 (a) 7 : 13 (b) 2 : 7 (c) 1 : 4 (d) 5 : 11 (e) 3 : 8

Direction (37 – 41): Pie chart given below shows total number of students in four schools (A, B, C & D) and table shows number of boys in these four schools. Read the data carefully and answer the questions.

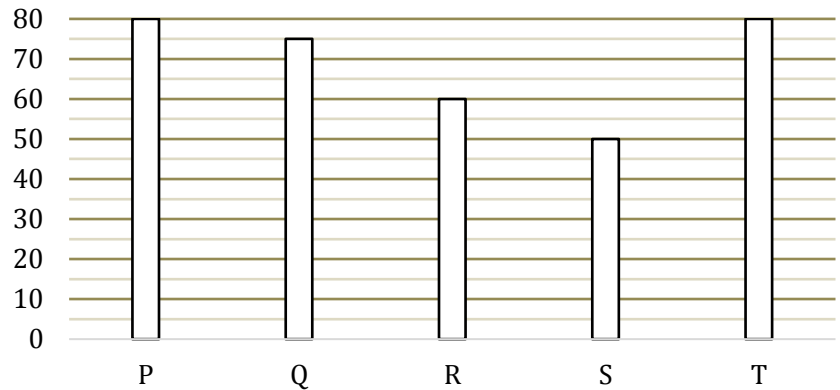
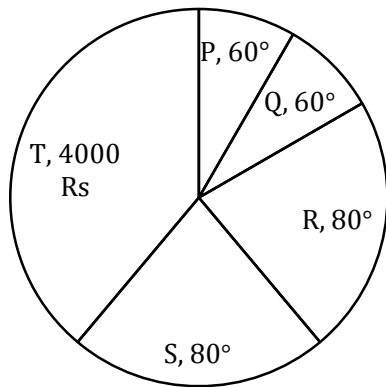
Total number of students = 2000



Schools	Total number of boys
A	320
B	180
C	280
D	360

37. Number of girls in A & D together is how much more than number of boys in A & C together?
 (a) 180 (b) 160 (c) 140 (d) 120 (e) 210
38. Total number of girls in C is what percent less than total students in B?
 (a) 35% (b) 45% (c) 40% (d) 30% (e) 25%
39. Find central angle of total girls in A & C together with respect to total students?
 (a) 120° (b) 60° (c) 105° (d) 72° (e) 90°
40. If in school 'X' total boys are 20 more than the total girls in B and total boys in 'X' are 60% of total students in that school, then find ratio of total girls in D to that of in 'X'.
 (a) 6 : 7 (b) 7 : 9 (c) 7 : 6 (d) 7 : 11 (e) 7 : 8
41. If in school E number of boys is 25% more than total girls in A and ratio of boys to girls in E is 7 : 3, then find average number of girls in D & E?
 (a) 135 (b) 130 (c) 145 (d) 115 (e) 105

Direction (42 – 46): Pie chart given below shows distribution (in degree and in absolute value) of savings of five persons (P, Q, R, S & T) and bar graph shows percentage of expenditure of these five persons. Read the data carefully and answer the questions.

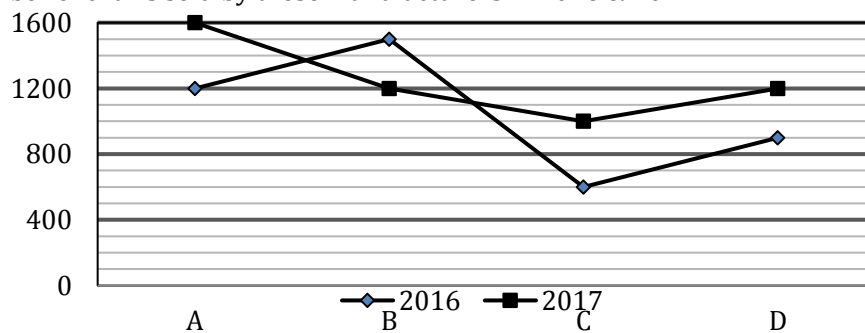


Note – Total income of any person = Total (saving + expenditure) of that person.

42. Find ratio of income of P to that of T?
 (a) 3 : 2 (b) 2 : 3 (c) 3 : 5 (d) 4 : 3 (e) 3 : 4
43. Total expenditure of Q is what percent more than that of R?
 (a) 40% (b) 50% (c) 55% (d) 30% (e) 48%
44. Find average income of R & S?
 (a) 10000 Rs. (b) 8000 Rs. (c) 9000 Rs. (d) 7000 Rs. (e) 5000 Rs.
45. If income of A is 140% more than that of R and saving of A is 100% more than that of S, then find expenditure percentage of A?
 (a) $72\frac{1}{3}\%$ (b) $60\frac{1}{3}\%$ (c) $33\frac{1}{3}\%$ (d) $66\frac{2}{3}\%$ (e) $66\frac{1}{3}\%$
46. Income of Q is what percent less than that of P?
 (a) 10% (b) 22.5% (c) 30% (d) 25% (e) 20%

Directions (47-51): Study the line chart and table given below and answer the following questions.

Line chart shows the number of chairs manufactured by 4 different chair manufacturers (A, B, C & D) in 2016 & 2017 and table shows the number of chairs sold by these manufacturers in 2016 & 2017.

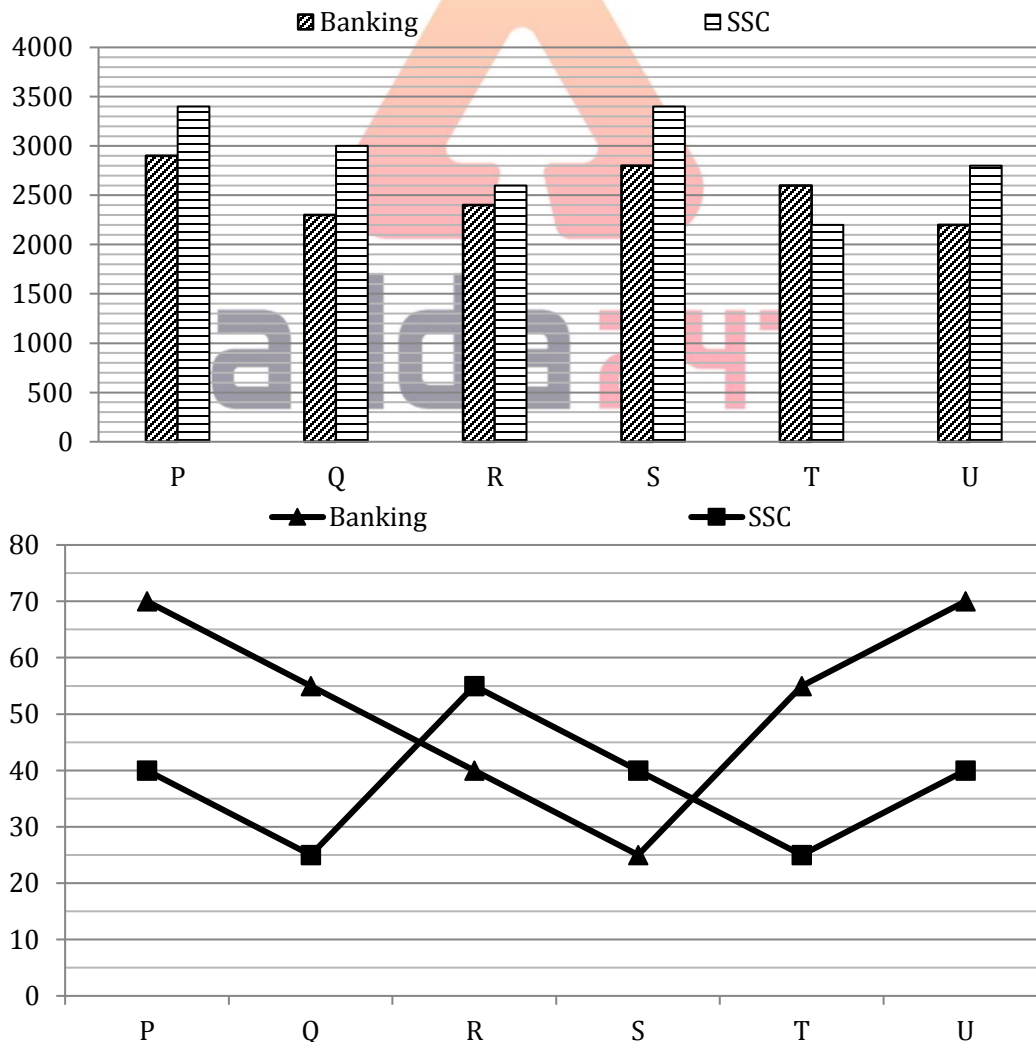


Manufacturer	Chairs sold	
	2016	2017
A	840	1440
B	900	1080
C	570	900
D	810	720

Note – Total chairs manufactured by any manufacturer in any year
 = Total chairs (sold + unsold) of that manufacturer in that year.

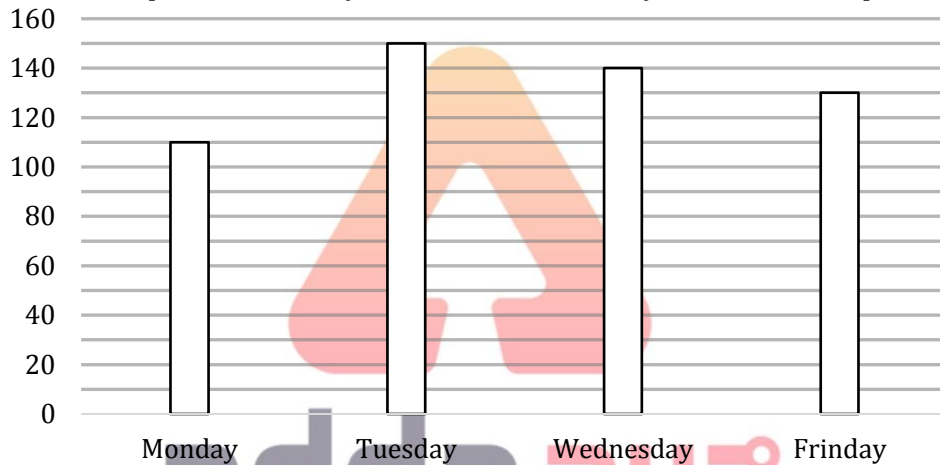
47. Unsold chairs of A & D together in 2016 are what percent of sold chairs of B & D together in 2017?
 (a) 75% (b) 40% (c) 25% (d) 55% (e) 60%
48. If manufacturing cost of a chair for D in 2016 & 2017 is Rs.200 and selling price of a chair for D in 2016 & 2017 is Rs.250 and Rs.400 respectively, then find profit% is maximum in which year among 2016 & 2017 for D? (D destroyed all the unsold chairs in these 2 years)
 (a) Maximum in 2017 (b) Maximum in 2016 (c) Equal in 2016 & 2017 (d) None of these (e) Cannot be determined
49. Find ratio of chairs manufactured by A & C together in 2016 to chairs sold by C & D together in 2017.
 (a) 7 : 5 (b) 11 : 5 (c) 12 : 7 (d) 10 : 9 (e) 5 : 3
50. If chairs manufactured by A in 2018 are 50% more than chairs sold by B in 2016 and ratio of sold to unsold chairs of A in 2018 is 2 : 1, then find average of chairs sold by A in 2016, 2017 & 2018.
 (a) 1150 (b) 1060 (c) 1200 (d) 1170 (e) 1030
51. Find average number of chairs sold by A, B, C & D in 2016 is how much more or less than total unsold chairs of A, B, C & D together in 2017?
 (a) 80 (b) 160 (c) 350 (d) 190 (e) 270

Directions (52-56): the bar graph given below provides the information of students who appeared for banking and ssc exams from given cities and line graph provides details of percentage of qualified students of these two exams from given cities.



52. What is the ratio of number of SSC qualified students from cities P and R together and SSC students qualified from cities S and U together?
 (a) 248: 279 (b) 279: 248 (c) 289: 240 (d) 259: 265 (e) 279: 227
53. What is average number of students qualified in banking exams from cities R,S and T together in 2017?
 (a) 1050 (b) 1090 (c) 1030 (d) 1130 (e) 1160
54. Find the difference between qualified students of banking to SSC students in cities P, Q and T together?
 (a) 2080 (b) 2065 (c) 2015 (d) 2130 (e) 2200
55. Number of banking students who qualified from cities R and S together is how much more/less than number of ssc students who qualified from cities Q and U together?
 (a) 260 (b) 160 (c) 180 (d) 210 (e) 230
56. Find the total number of qualified students of SSC exams from all the given cities together?
 (a) 6480 (b) 6600 (c) 6890 (d) 6570 (e) 6350

Direction (57 – 61): Bar graph given below shows number of people visited a park 'XYZ' on four different days and table shows number of females visited park on these days. Read the data carefully and answer the questions.

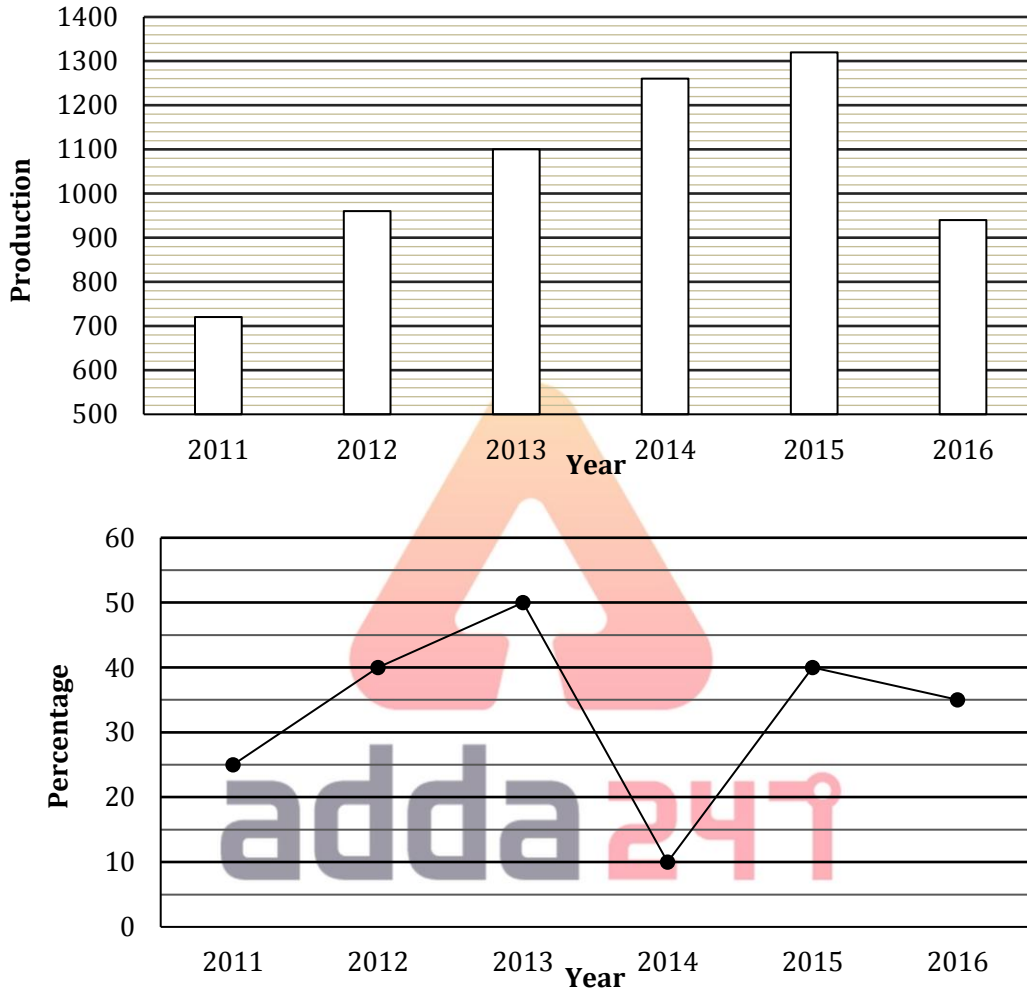


Days	Number of females visited park
Monday	52
Tuesday	66
Wednesday	64
Friday	46

57. Find the ratio of the total male visited park on Tuesday & Wednesday together and total female visited park on Wednesday & Friday together?
 (a) 16 : 11 (b) 14 : 11 (c) 18 : 11 (d) 12 : 11 (e) 11 : 16
58. Total male visited on Sunday in park are 22 more than that of on Monday and total number of males visited on Sunday in park are $66\frac{2}{3}\%$ of total people visited park on that day. Find total male visited park on Friday is what percent less than total people visited park on Sunday?
 (a) 40% (b) 30% (c) 20% (d) 25% (e) 15%
59. Find difference between average number of males visited park on Monday & Friday and average number of females visited park on Tuesday & Wednesday?
 (a) 15 (b) 13 (c) 17 (d) 6 (e) 25
60. Total males visited Wednesday is what percent less than total male visited on Tuesday(approximate)?
 (a) 14.5% (b) 12.5% (c) 9.5% (d) 6.5% (e) 3.5%

61. Total people visited on Saturday are $9\frac{1}{11}\%$ more than that of on Monday, then find total people visited on Tuesday is what percent more than that of on Saturday?
 (a) 15% (b) 25% (c) 12.5% (d) 20% (e) 10%

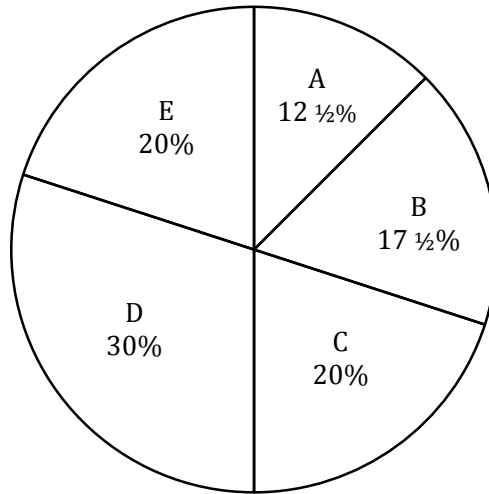
Directions (62-66): Bar graph given below shows total production of a company which produced two types of cars X and Y in given six years. Line graph shows production of Y in excess of X in-terms of percentage. Study the data carefully and answer the following question.



62. Total Y type car produced by company in year 2011 and 2012 together is what percent of the total Y type car produced by company in year 2014 and 2016 together.
 (a) 70% (b) 75% (c) 80% (d) 90% (e) 120%
63. Find the ratio of total X type car produced in 2011 and 2012 together to total X type car produced in 2013 and 2015 together.
 (a) 21 : 22 (b) 15 : 22 (c) 7 : 10 (d) 8 : 11 (e) 6 : 11
64. In 2017, total production of company increases by 35% while production of X type car produced increase by 62% than that of in 2016, then find the percentage increase in the production of Y type car in 2017.
 (a) 10% (b) 15% (c) 20% (d) 25% (e) 30%
65. Find the average number of Y type car produced in 2011, 2013 and 2015 together.
 (a) 580 (b) 620 (c) 1570 (d) 590 (e) 610
66. In 2012, 20% Y type cars are defective while in 2014, 30% Y type cars are defective, then find the total Y type cars produced in 2012 and 2014 together which are non-defective?
 (a) 880 (b) 910 (c) 940 (d) 970 (e) 990

Directions (67-71): Pie graph given below shows total number of students appeared in five different exams, Table given below shows, percentage of students passed in exam out of total students appeared, and percentage of students who got first division out of total passed students in respective exam. Read given data carefully and answer the question.

Total appeared students = 16 lakh



Exams	Students passed out of total students (in %)	Student who got first division out of passed students (in %)
'A'	80%	25%
'B'	75%	40%
'C'	50%	35%
'D'	40%	50%
'E'	55%	75%

- 67.** Total students who passed with first division in 'D' and 'E' together is what percent more than total number of students who passed with first division in 'A' and 'C' together?
 (a) 127.5% (b) 137.5% (c) 237.5% (d) 217.5% (e) 147.5%
- 68.** Number of students failed in exam 'D' is how much more than number of students failed in exam 'B'?
 (a) 2,28,000 (b) 2,38,000 (c) 2,48,000 (d) 2,58,000 (e) 2,18,000
- 69.** Number of students who got second division in exam 'C' is 70% less than number of students who got third division in same exam. Find total number of students who got second division in exam 'C' if there?
 (a) 32,000 (b) 56,000 (c) 80,000 (d) 24,000 (e) 28,000
- 70.** Find the ratio between total number of students failed in exam 'A' and 'C' together to total number of students passed in exam 'E'?
 (a) 25 : 21 (b) 5 : 4 (c) 25 : 18 (d) 25 : 22 (e) 25 : 24
- 71.** Number of passed students who doesn't get first division in exam 'B' is what percent more than number of students who got first division in exam 'D'?
 (a) 52.5% (b) 55% (c) 31.25% (d) 34.25% (e) 37.75%

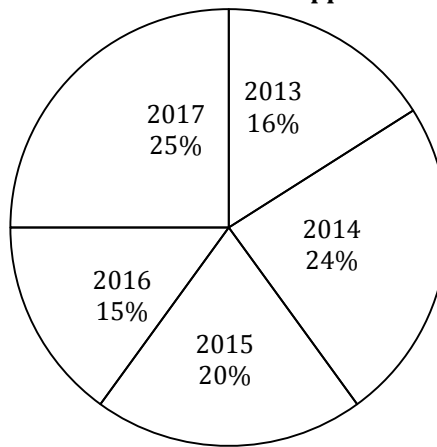
Directions (72-76): Study the following pie-chart and answer the questions.

Pie-chart given below shows the percentage distribution of students who applied for IBPS exam in 5 different year.

And table shows the percentage of student who paid the fees by debit card.

Note: Fees is paid only through debit and credit card.

Total number of student who applied = 12 lakh

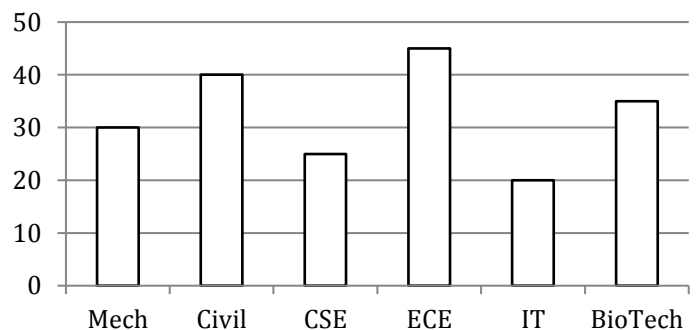


Year	% of student who paid through debit card
2013	37.5%
2014	25%
2015	62.5%
2016	42.5%
2017	20%

72. Number of students who paid their fees through credit card in year 2013 and 2014 together is how much more/less than number of students who paid through debit card in year 2015 and 2016 together?
 (a) 109500 (b) 112500 (c) 109600 (d) None of these (e) 129500
73. Number of students who paid through debit card in 2012 is equal to average of students who paid through debit card in 2016 and 2017 and students who paid through debit card is $\frac{2}{3}$ rd of total student in 2012. Then find total students in 2012?
 (a) None of these (b) 1,04,225 (c) 1,02,375 (d) 1,22,345 (e) 1,11,320
74. Students who paid fees through credit card in 2017 is what percent of students who paid fees through debit card in 2015? (a) 110% (b) 175% (c) 125% (d) 160% (e) None of these
75. Find the average number of students who paid their fees through debit card in year 2013, 2014 and 2016?
 (a) 71250 (b) 73500 (c) 75300 (d) None of these (e) 71750
76. If the fees is paid through credit card then each student has to pay Rs. 20 extra inclusive of fees. Then find the total extra amount paid by students in year 2015 and 2017 together?
 (a) 58 lakh (b) 54 lakh (c) None of these (d) 68 lakh (e) 66 lakh

Directions (77-81): Table given below shows total number of students in different streams of engineering in a college and bar graph shows number of boys more than number of girls in terms of percentage in each stream. Study the data carefully and answer the following question

Streams	Total students
Mech	805
Civil	672
CSE	900
ECE	784
IT	990
BioTech	705

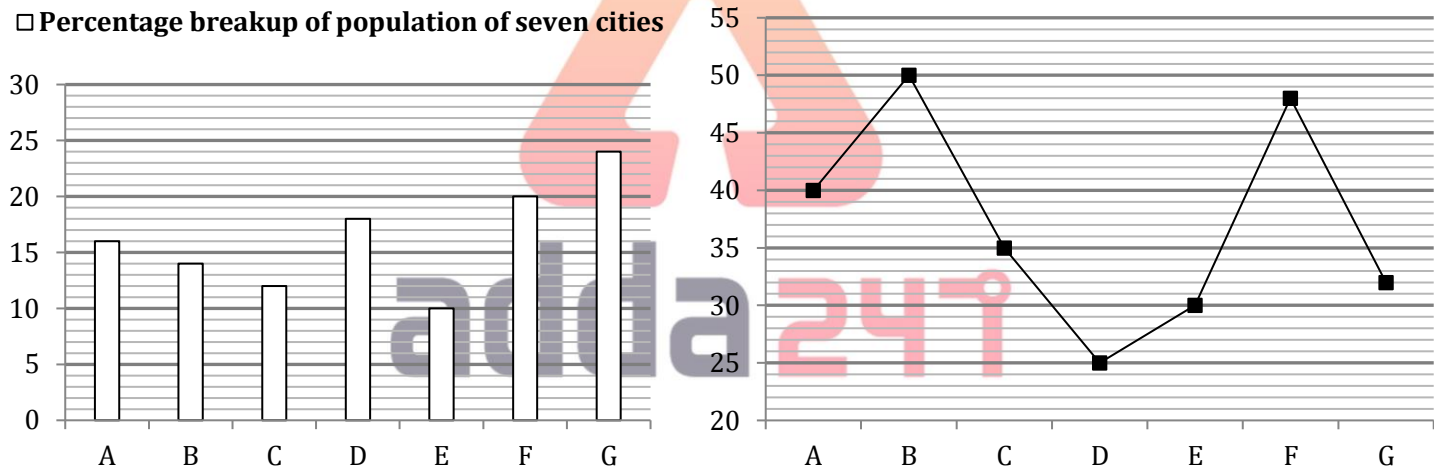


Note: Number of boys is always greater than number of girls in each stream.

77. Number of boys in Mech. stream is how much more than number of girls in IT stream?
 (a) 10 (b) 3 (c) 12 (d) 5 (e) 8
78. Find the average number of girls in Civil, CSE and ECE streams together?
 (a) $\frac{1000}{3}$ (b) 330 (c) 320 (d) 280 (e) 315
79. Boys and Girls who scored more than 8 CGPA in Biotech are 40% and 60% of their respective number in that stream. Then number of girls in Biotech not scoring more than 8 CGPA is what percent of boys scoring more than 8 CGPA in Biotech?
 (a) $72\frac{2}{9}\%$ (b) $73\frac{4}{27}\%$ (c) 75% (d) $74\frac{2}{27}\%$ (e) $71\frac{8}{27}\%$
80. 75% and 60% of the students of CSE and IT streams are got placed in TCS which is 75% of the total students got placed in TCS from that college. Number of girls from CSE and IT who got placed in TCS is 350 and 30% of total students in that stream respectively. Then number of boys from these two streams placed in TCS is what part of total number of placed students in TCS?
 (a) $\frac{299}{846}$ (b) $\frac{311}{846}$ (c) $\frac{28}{141}$ (d) $\frac{160}{423}$ (e) $\frac{170}{423}$
81. Number of girls in Mech. is what percent more than number of girls in Civil?
 (a) 30% (b) 25% (c) 35% (d) 45% (e) 55%

Direction (82 –86): Given below bar graph shows percentage breakup of population of six cities (A, B, C, D, E, F) and population of G given in absolute value (in hundred), while line graph shows percentage of illiterate population in each cities. Read the data carefully and answer the question.

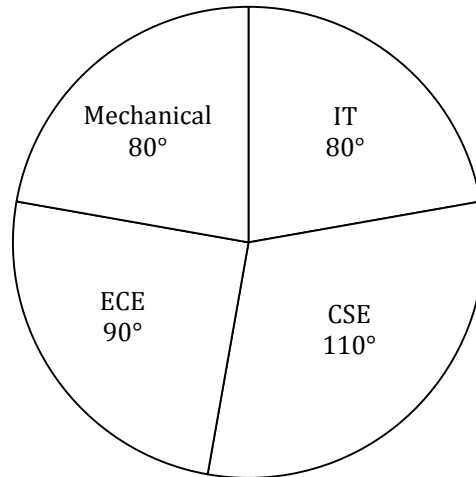
□ Percentage breakup of population of seven cities



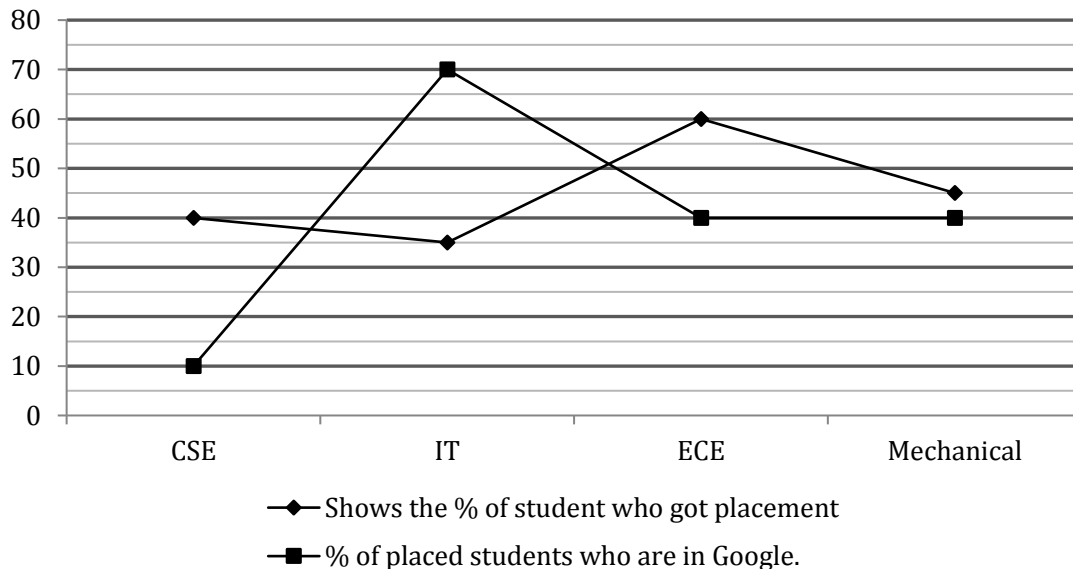
82. The average population of cities A, B & C is what percent less than the average population of cities D, E & F?
 (a) 7.5% (b) 10% (c) 12% (d) 12.5% (e) 16%
83. If total population of city A is increased by 50%, and population of city B is decreased by 25%, then find total population of cities A & B together is approximately what percent of total literate population of cities D & F together?
 (a) 148% (b) 128% (c) 144% (d) 138% (e) 150%
84. Total illiterate population of cities B & D together is how much less than total literate population of cities A & F together?
 (a) 1880 (b) 2040 (c) 2404 (d) 2208 (e) 2200
85. The ratio of literate male to literate female in city C is 13 : 11 and that in city G is 5 : 11, then find difference between literate female in both the cities?
 (a) 288 (b) 240 (c) 256 (d) 244 (e) 264
86. Total illiterate male in the city E is 36% of total literate male in city D, then find the total illiterate female in city E is what percent of total literate female in city D?
 (a) 18% (b) 16% (c) 26% (d) Can't be determined (e) 32%

Direction (87-91): Pie- chart given below shows degree distribution of students of 2014-18 batch from college XYZ.

Total number of students = 900



Line-graph below shows the percentage of students who are placed from each branch and percentage of students who got placement in google out of total placed student in that branch.



- 87.** What are the total number of students from IT and ECE who got placed in google.
 (a) 49 (b) 54 (c) 103 (d) 113 (e) None of these
- 88.** If 20% students of ECE got campus placement, then what is the ratio of number of students who got campus placement from ECE to number of students who got placed but not in google from ECE.
 (a) 5 : 9 (b) 2 : 3 (c) 1 : 2 (d) 2 : 5 (e) 7 : 9
- 89.** What is the % of students, who got placed in google from college.
 (a) $8\frac{1}{3}\%$ (b) $12\frac{1}{2}\%$ (c) $15\frac{2}{3}\%$ (d) $16\frac{2}{3}\%$ (e) 20%
- 90.** What is the difference between students who got placement in Google from CSE and the students who got degrees but didn't get placement from Mechanical.
 (a) 110 (b) 90 (c) 121 (d) 100 (e) 99
- 91.** If 20% of students who remains unplaced from CSE also got placement in some other. Calculate the % of students who got placed in Google from placed students of CSE.
 (a) 10% (b) 9% (c) 8.54% (d) 7.69% (e) 5.75%

Directions (92-96): Study the graph carefully to answer the following questions:

Voter's percentage and information of voting population of Chhattisgarh in 2013 is given in below drawn charts:

Total voters = 3,00,000

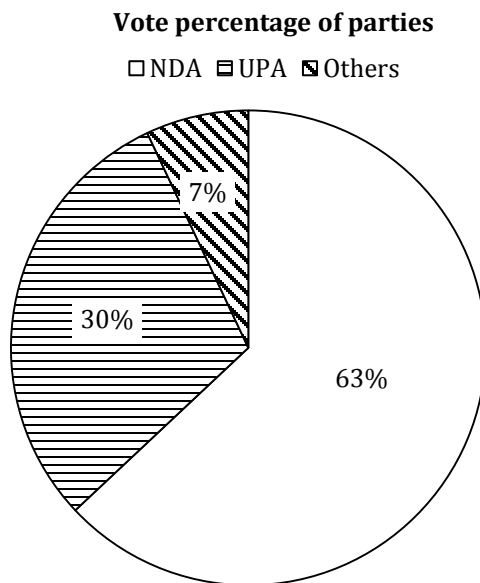


Table shows the percentage distribution of votes polled by different age group and ratio of male to female:

Information about voters age groups who voted for NDA		
Age groups	Voting population %	Male to Female ratio
18 – 30	40 %	5 : 4
31 – 45	30 %	7 : 8
46 – 60	20 %	8 : 7
Above 60	10 %	11 : 9

92. Total number of males who voted for UPA is 150% of the females from 18 – 30 age group who voted for NDA. Then, find the ratio of male to female voters who voted for UPA.

- (a) 16 : 13 (b) 14 : 12 (c) 15 : 14 (d) 14 : 11 (e) None of the above.

93. 10% of the total voting population is above 60 years of age and the male to female ratio of voters who are above 60 years of age is 8 : 7. 25% of the total voters who are above 60 years voted for others and the male to female ratio of voters voted for others who are above 60 years of age is 2 : 3. Then, find the number of female voters who voted for UPA and are above 60 years of age.

- (a) 995 (b) 1030 (c) 945 (d) 1100 (e) None of the above.

94. Number of females (31-45) voted for NDA is what percent more or less than the number of males (46-60) voted for NDA.

- (a) 54% (b) 45% (c) 59% (d) 60% (e) None of the above.

95. Find the total number of males who voted for NDA is how much more than the total number of females who voted for NDA.

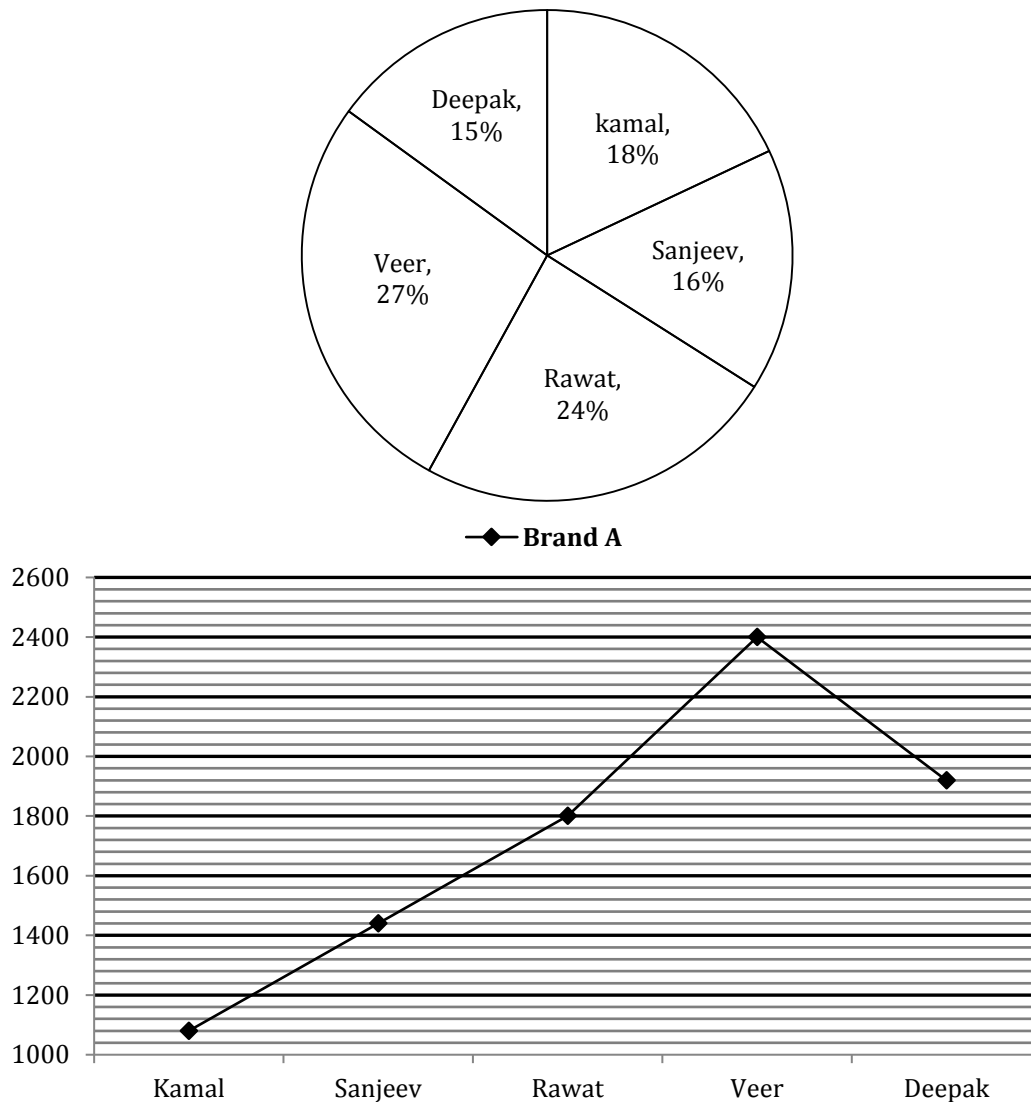
- (a) 9930 (b) 9630 (c) 9030 (d) 8430 (e) 10030

96. Total voting population between age group (46 – 60) is 25% of the total voting population. Then find what percent of voters (46 – 60) voted for either UPA or Others of the total voting population (46 – 60).

- (a) 54% (b) 46.8% (c) 49.6% (d) 51.1% (e) None of the above.

Direction (97-101): - Pie chart given below shows total bats of three brands (A, B and C) sold by five retailers. Line chart shows brand 'A' bats sold by five retailers. Study the data carefully and answer the following questions.

Total bats sold = 66,000

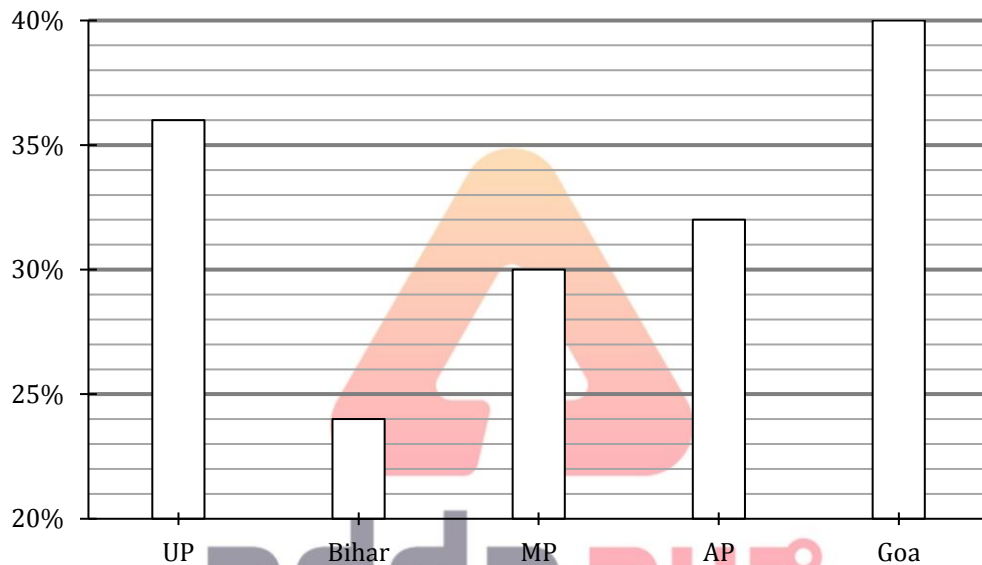


97. Brand 'C' bats sold by kamal is 25% more than brand 'B' bats sold by Kamal. Find bats of brand 'C' sold by kamal is what % more than bats of brand 'A' sold by Sanjeev?
 (a) $333\frac{1}{3}\%$ (b) $233\frac{1}{3}\%$ (c) $166\frac{2}{3}\%$ (d) $266\frac{2}{3}\%$ (e) 100%
98. Find the difference between bats of brand 'B' and 'C' sold by Deepak to bats of brand 'B' and 'C' sold by Veer?
 (a) 7980 (b) 7440 (c) 6440 (d) 6980 (e) 7240
99. Ratio of bats of brand 'B' to bats of brand 'C' sold by Rawat is 9 : 1. Find bats of brand 'B' sold by Rawat is how much more/less than bats sold by Sanjeev.
 (a) 2025 (b) 2034 (c) 2054 (d) 2076 (e) 2084
100. Out of total bats sold of brand 'A' by all five retailers $\frac{4}{9}$ were sold at Rs 400 each and $\frac{5}{9}$ were sold at Rs 600 each. Find total amount earned by selling all bats of brand 'A' by all retailers.
 (a) 42.16 lakh (b) 42.46 lakh (c) 44.16 lakh (d) 34.22 lakh (e) None of the given options
101. Bats of brand 'B' and 'C' together sold by Rawat is what percent more than bats of brand 'B' and 'C' together sold by Kamal?
 (a) 20% (b) 10% (c) 40% (d) 30% (e) 50%

Direction (102 – 106): Table given below shows total population of five states and ratio of population voted for party X to party Y.

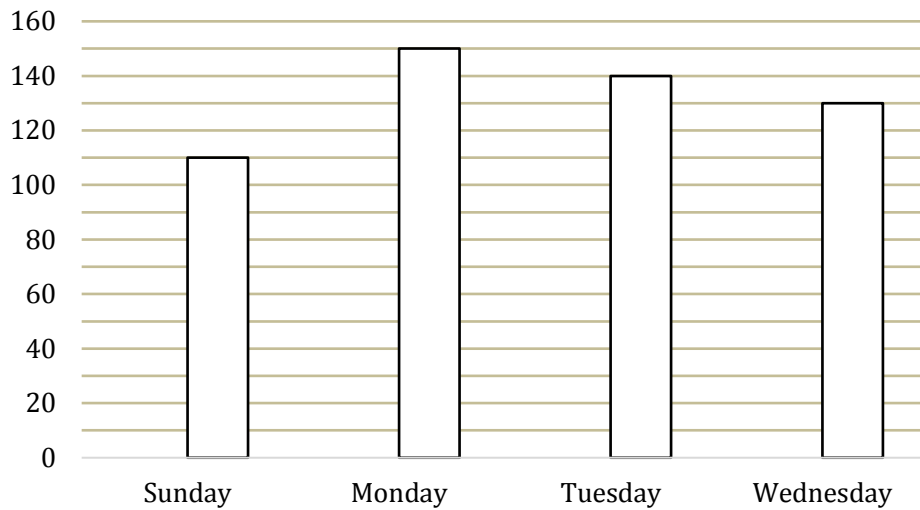
Bar-graph shows percentage of population voted for party Z out of total population. Read both table and bar graph carefully and answer the questions:

State	Total population (in thousand)	Ratio of population voted for party X : party Y
UP	4800	7 : 5
Bihar	1250	3 : 7
MP	2400	2 : 3
AP	1400	4 : 3
Goa	750	3 : 2



- 102.** If ratio of male to female who voted for party X in state MP is 5 : 7, then female who voted for party X in MP is what percent of total population who voted for party Z in same state?
 (a) 66% (b) $62\frac{2}{9}\%$ (c) $54\frac{4}{9}\%$ (d) $58\frac{2}{5}\%$ (e) $44\frac{4}{9}\%$
- 103.** Total population who voted for party Z in state UP and Bihar together is how much more or less than total population who voted for party X in same state? (in thousand)
 (a) 49 (b) 54 (c) 64 (d) 128 (e) 24
- 104.** Find the total population who voted for party Y in state Goa, AP and Bihar together? (in thousand)
 (a) None of these (b) 2102 (c) 1728 (d) 1123 (e) 1253
- 105.** In another state Kerala population who voted for party X is 50% more than that who voted for party X in state UP and party Y got 50 votes more than party X in Kerala. If total population of Kerala to total population of MP is in ratio 13 : 4. Then find the population who voted for party Z in Kerala?(in thousand)
 (a) 2123 (b) 2474 (c) None of these (d) 2374 (e) 2432
- 106.** Find ratio of total population who voted for party Y in state Goa and MP together to total population who voted for party Z in state UP and AP?
 (a) 293 : 544 (b) 297 : 543 (c) 3 : 5 (d) None of these (e) 297 : 544

Direction (107 – 111): The bar graph given below shows number of people who visited to a stadium on four different days of a week. Table shows number of females visited to stadium out of total people. Read the data carefully and answer the questions given below.



Days	Female
Sunday	52
Monday	66
Tuesday	64
Wednesday	46

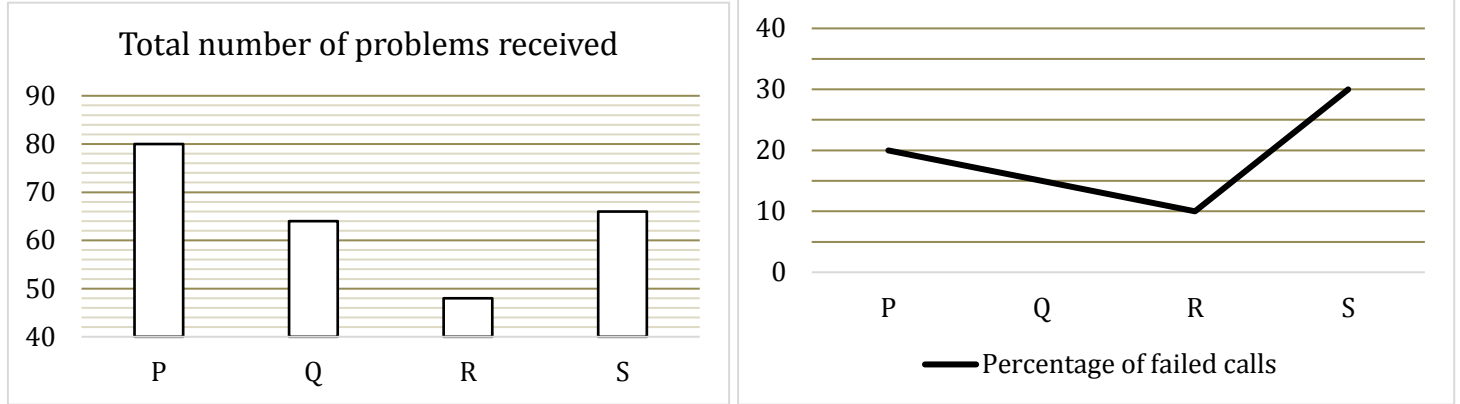
- 107.** Find the ratio of total no. of males who visited stadium on Sunday & Wednesday together to total no. of females who visited stadium on Monday & Tuesday together?
 (a) 81 : 65 (b) 71 : 65 (c) 71 : 95 (d) 71 : 55 (e) None of these
- 108.** Find the difference between average no. of females who visited stadium on Sunday & Tuesday together and average no. of male who visited stadium on Monday & Wednesday?
 (a) 24 (b) 8 (c) 38 (d) 26 (e) 18
- 109.** Total no. of males who visited to stadium on Tuesday is what percent less than total no. of males who visited stadium on Monday (approximate)?
 (a) 4.5% (b) 12.5% (c) 11.5% (d) 15% (e) 9.5%
- 110.** Total people who visited stadium on Friday are 20% more than that on Monday and total male who visited to stadium on Friday are 25% more than total males who visited to stadium on Monday. Find number of females who visited stadium on Friday?
 (a) 55 (b) 75 (c) 65 (d) 50 (e) 45
- 111.** Total no. of people who visited stadium on Sunday and Wednesday together is what percent more than total no. of males who visited stadium on Monday & Tuesday together?
 (a) 40% (b) 35% (c) 50% (d) 60% (e) 80%

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Direction (112 – 116): Bar graph given below shows total number of problems received by four network companies (in '00) and line graph shows percentage of unresolved problems out of total problems received by respective network companies. Read the data carefully and answer the questions.



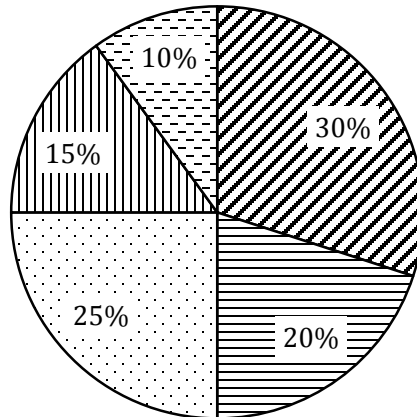
Note: Total problems = Resolved problems + Unresolved problems

- 112.** Find the total resolved problems by P & R together?
 (a) 10740 (b) 10720 (c) 10840 (d) 10960 (e) 10800
- 113.** Total unresolved problems by S are what percent more than total unresolved problems by Q?
 (a) 104.25% (b) 106.25% (c) 102.25% (d) 100.25% (e) 96.25%
- 114.** Find average number of resolved problems by Q & S?
 (a) 5030 (b) 5010 (c) 5060 (d) 5080 (e) 5020
- 115.** Total resolved problems by R are what percent less than total resolved problems by P?
 (a) 20.5% (b) 28.5% (c) 34.5% (d) 30.5% (e) 32.5%
- 116.** Find total unresolved problems by all the five network companies?
 (a) 5020 (b) 5040 (c) 5060 (d) 5080 (e) None of these

Directions (117-120): Study the following graph carefully to answer the questions that follow.

Percentage of students studying in different Universities

Total number of students = 80,000



- ▣ Allahabad University
- ▣ Patna University
- ▣ Delhi University
- ▣ Banaras Hindu University
- ▣ Lucknow University

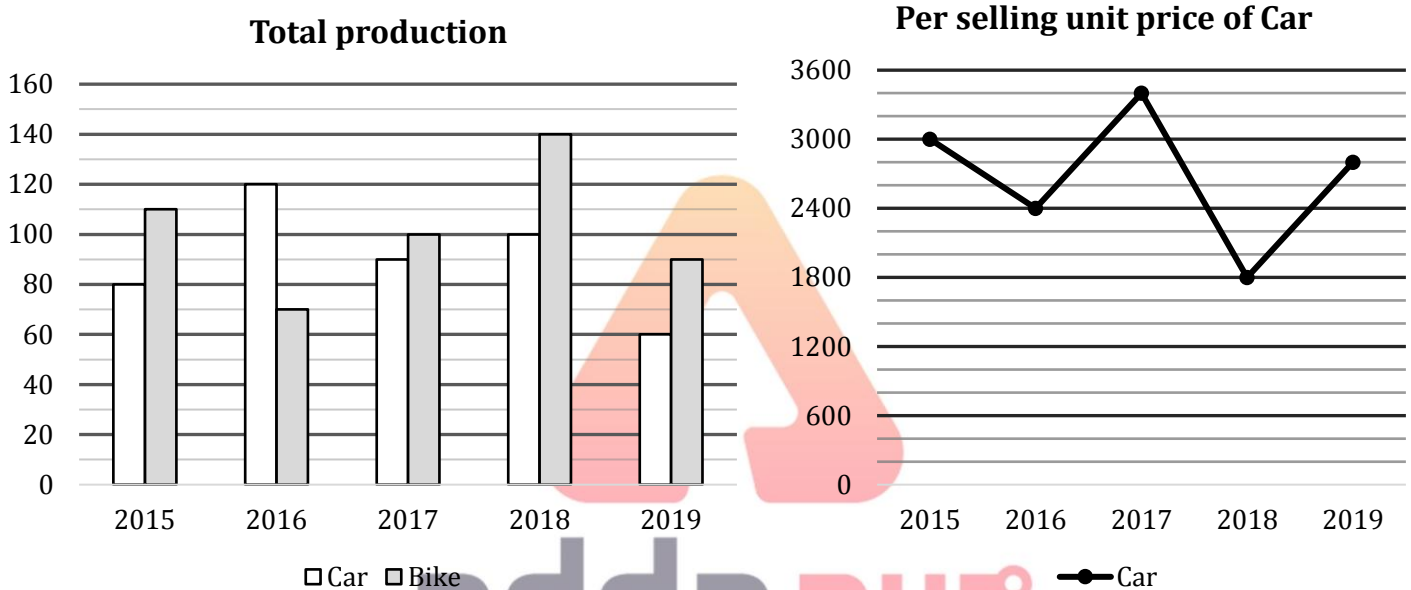
Ratio of boys to Girls studying in these Universities:

University	Boys : Girls
Allahabad University	8 : 7
Patna University	7 : 3
Delhi University	3 : 2
Banaras Hindu University	4 : 1
Lucknow University	9 : 1

117. How many boys students are studying at Banaras Hindu University?
 (a) 8600 (b) 9000 (c) 9500 (d) 9600 (e) 9800
118. What is the ratio between the number of students studying at Allahabad University and Delhi University?
 (a) 4:5 (b) 6:5 (c) 5:6 (d) 6:1 (e) 5:4
119. What is the average number of boys studying at Patna University, Delhi University and Allahabad University?
 (a) 12,000 (b) 13,000 (c) 14,000 (d) 12,500 (e) None of these
120. What is the difference between male and female students studying at Lucknow University?
 (a) 5400 (b) 6400 (c) 7200 (d) 6000 (e) 6500

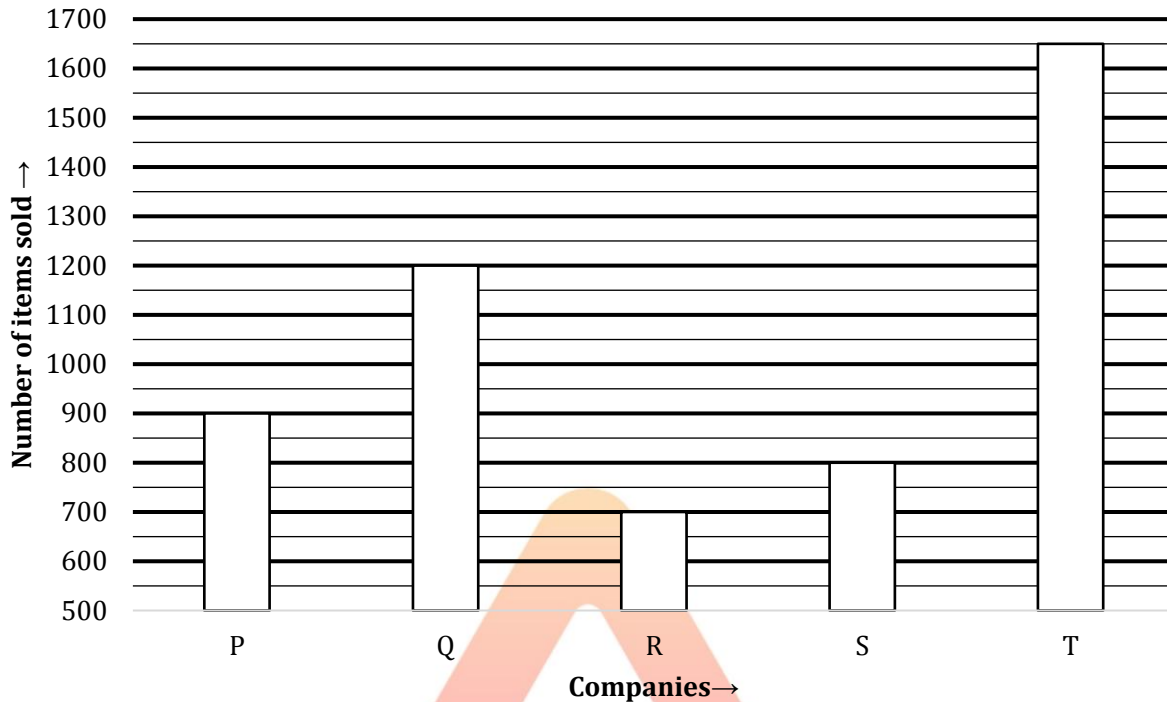
Directions (121-125): Study graph carefully and answer the following questions.

The Bar graph shows the total production of Car and Bike in given years by a company and the Line graph shows the per unit selling price of Car in given years.



121. If total revenue obtained by company by selling Car and Bike in year 2017 is Rs. 4.5 Lakh, then find per unit selling price of Bike in 2017?
 (a) Rs. 1640 (b) Rs. 1440 (c) Rs. 4500 (d) Rs. 3400 (e) Rs. 2500
122. If ratio of per unit selling price of Car and Bike in 2018 is 3:4, then Find the ratio of revenue made by Bike to Car in the year 2018?
 (a) 15:28 (b) 8:5 (c) 5:8 (d) 28:15 (e) 14:15
123. If selling price of per unit bike in 2018 is 37.5% of selling price of Car in 2016, then find revenue made by selling of Cars in 2018 is how much per cent of revenue made by selling of Bike in 2018?
 (a) $\frac{1000}{7}\%$ (b) $\frac{2000}{7}\%$ (c) $\frac{3000}{7}\%$ (d) $\frac{4000}{7}\%$ (e) 135%
124. If production of car in 2020 is increased by 20% over previous year and selling price of Car increased by 12.5% over previous year, then find total per cent increase in revenue of car in 2020 over previous year?
 (a) 37.5% (b) 35% (c) 32.5% (d) 40% (e) 42.5%
125. The selling price of a bike in 2020 is $14\frac{2}{7}\%$ less than the selling price of a car in 2019. If profit on selling one Bike is 25% and total manufactured Bikes in 2020 are 120, then Find cost price of Bike in 2020?
 (a) Rs.1960 (b) Rs. 1820 (c) Rs. 1920 (d) Rs. 1840 (e) Rs. 1880

Direction (126-130): - Bar chart given below shows total number of items sold by five companies and table shows the percentage of items which are rejected (due to some defect in them) by customers out of total items sold by respective companies.



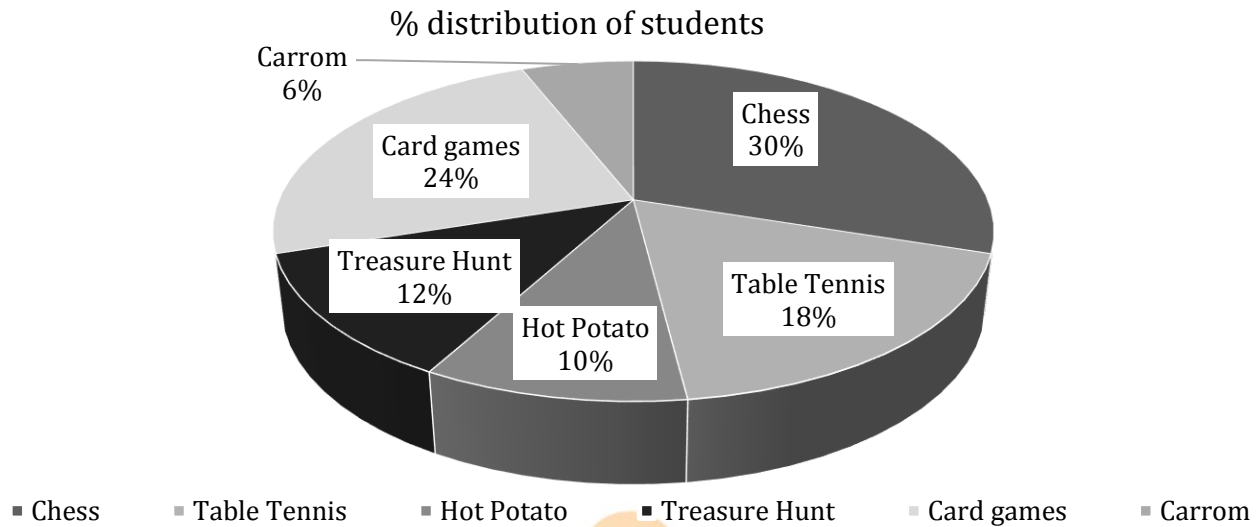
Companies	Percentage of items rejected
P	25
Q	20
R	15
S	40
T	30

Note - Total items sold = number of items rejected + number of items which are not rejected

- 126.** Find the average number of items which are rejected by the customers to company P, R and T?
 (a) 275 (b) 255 (c) 325 (d) None of these (e) 350
- 127.** Number of items sold by company P which are not rejected are what percent more or less than total items which are rejected by customers to company Q and R together?
 (a) 85% less (b) $85\frac{11}{23}$ % more (c) $75\frac{13}{23}$ % less (d) $95\frac{15}{23}$ % more (e) 77% less
- 128.** Find the ratio of number of items which are not rejected by customers to company S to total number of items which are rejected by customers to company R and T together?
 (a) 2 : 5 (b) 1 : 2 (c) 4 : 5 (d) 3 : 5 (e) None of these
- 129.** Rejected items by customers to company Q is what percent of rejected items by customers to company S?
 (a) 50% (b) 75% (c) 45% (d) 60% (e) 65%
- 130.** What is the difference between no. of items which are sold by company R and T, which are not rejected by customers?
 (a) None of these (b) 420 (c) 520 (d) 440 (e) 560

Directions (131-135): Study the below mentioned charts carefully and answer the following questions.

Pie chart shows the percentage distribution of students of a school playing different sports and table chart shows the ratio of boys and girls who are playing these sports.

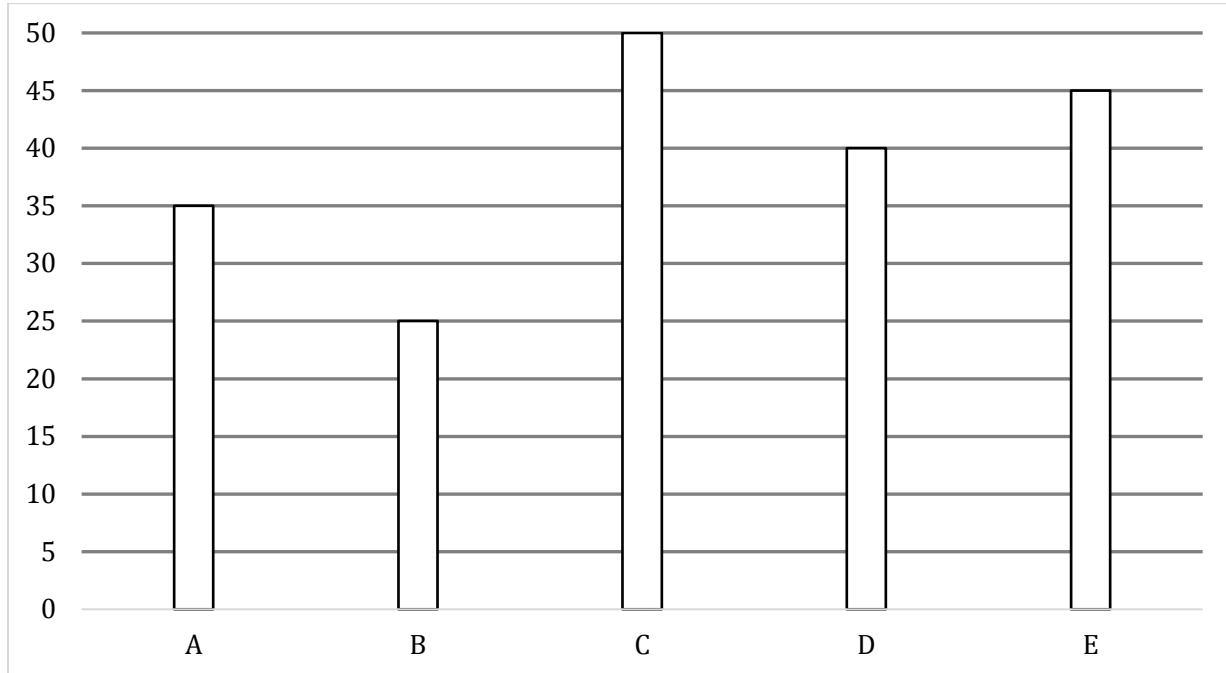


Games	Ratio of boys to girls
Chess	7 : 5
Table Tennis	25 : 11
Hot Potato	2 : 3
Treasure Hunt	5 : 7
Card Games	1 : 1
Carrom	5 : 3

Note – Total number of students = 800
1 student plays only 1 game.

- 131.** Girls playing Hot Potato and Chess together is what percent more or less than the boys playing Table Tennis?
(a) 39% (b) 42% (c) 36% (d) 48% (e) 57%
- 132.** Find the ratio of average of girls playing Chess, Table Tennis and Card Games to number of boys playing Hot Potato and Card games together.
(a) 4 : 7 (b) 7 : 4 (c) 5 : 9 (d) 9 : 5 (e) 5 : 8
- 133.** Boys playing Chess and Table Tennis together is what percent of girls playing Hot Potato, Treasure Hunt and Card Games together?
(a) 130% (b) 100% (c) 110% (d) 120% (e) 140%
- 134.** 75% of students who play Carrom stops playing Carrom and starts playing Treasure Hunt due to which number of girls playing Treasure Hunt increased by 25%, then find the ratio of boys to girls who are still playing Carrom.
(a) 3 : 2 (b) 4 : 3 (c) 2 : 1 (d) 5 : 4 (e) None of the above.
- 135.** Find the central angle (in degrees), enclosed boys playing Treasure Hunt.
(a) 18 (b) 8.5 (c) 9.75 (d) 10 (e) 7.25

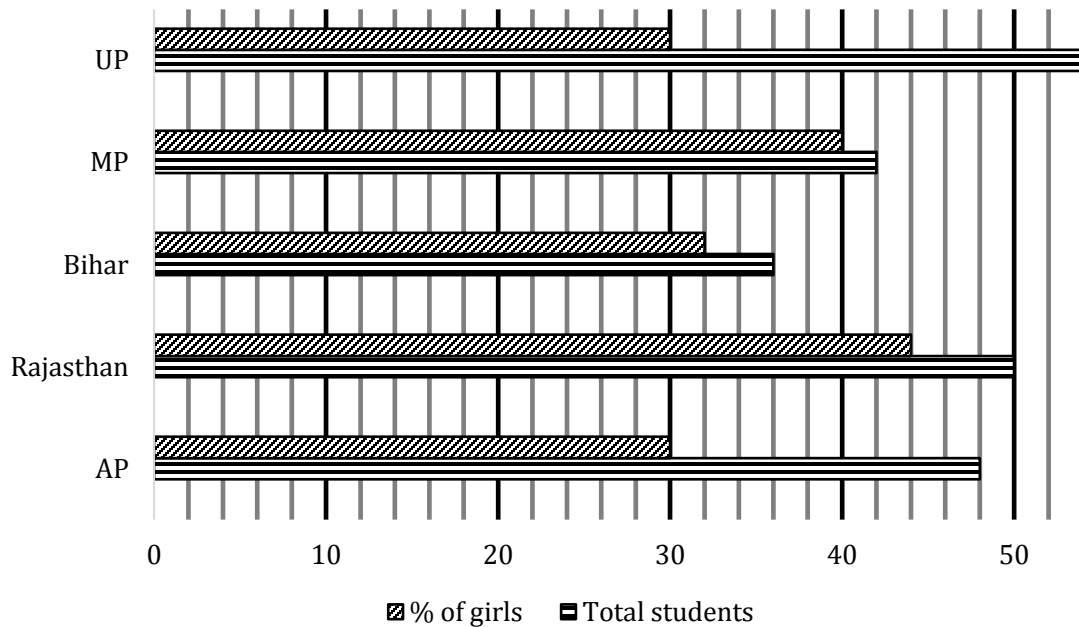
Direction (136 – 140) : Bar graph given below shows percentage by which 4 GB mobile sold by five different stores is more than 6 GB mobile sold by these five stores, while table shows total 4 GB and 6 GB mobile sold by these five stores. Read the data carefully and answer the questions.



Stores	Total sold mobiles
A	2820
B	1890
C	2400
D	2592
E	1960

- 136.** Total 4 GB mobile sold by store B & D together is what percent more than total 6 GB mobile sold by A & E together?
 (a) 28.1% (b) 26.1% (c) 24.1% (d) 30.1% (e) 32.1%
- 137.** If store C sold only three mobile brands, i.e Samsung, Xiaomi & Huawei and ratio of total 4GB & 6GB Samsung, Xiaomi & Huawei mobile sold by store C is 9 : 10 : 5 and 7 : 6 : 3 respectively, then find ratio of total 4GB & 6GB mobile of Samsung sold by store C to total 6GB mobile sold by store D?
 (a) 8 : 11 (b) 8 : 13 (c) 8 : 7 (d) 8 : 9 (e) None of these
- 138.** Find the average number of 6GB mobile sold by store A, B and D are what percent of total 6GB mobile sold by store E?
 (a) 130% (b) 125% (c) 133% (d) 120% (e) 110%
- 139.** If total 6GB mobile sold by store F is 20% more than total 4GB mobile sold by store B and total 6GB mobile sold by store F is 45% of total mobile sold by store F, then find difference between total 4GB mobile sold by store F and total 4GB mobile sold by store E?
 (a) 360 (b) 320 (c) 380 (d) 480 (e) 300
- 140.** If 20%, 25% and 12.5% out of total 4GB sold mobile by A, C & D respectively are defective then find total sold mobile which are not defective by these three stores?
 (a) 5879 (b) 6869 (c) 5859 (d) 6939 (e) 5699

Directions (141 – 145): Bar chart given below shows total students (in thousand) in five different state board and percentage of girls in these state boards, while table shows percentage of boys appeared in exam and ratio of boys to girls appeared in exam. Read the data carefully and answer the questions.



States	% of appeared boys	Ratio of appeared boys to appeared girls
UP	90%	9 : 4
MP	80%	16 : 9
Bihar	75%	3 : 1
Rajasthan	96%	4 : 3
AP	80%	24 : 11

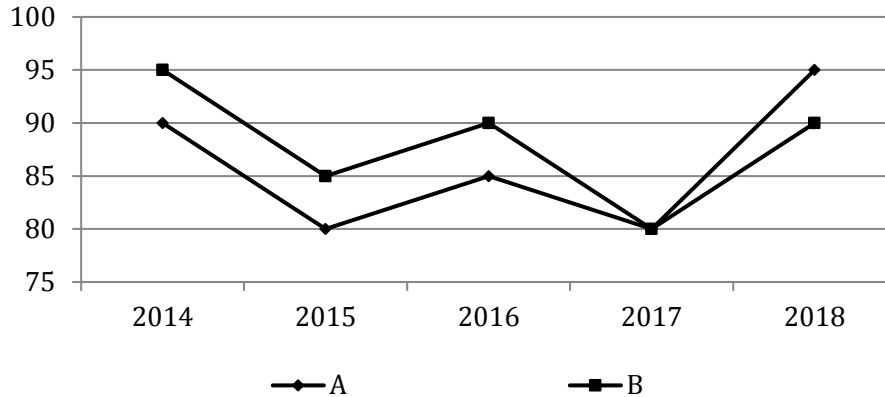
- 141.** Find the difference between girls appeared in exam from AP and that of from UP?
 (a) 2400 (b) 2800 (c) 2000 (d) 3200 (e) 3600
- 142.** What is the percentage of girls appeared in exam from Bihar?
 (a) 52.125% (b) 55.125% (c) 54.125% (d) 53.125% (e) None of these
- 143.** Find the ratio of total girls appeared in exam from MP to total boys appeared in exam from AP?
 (a) 37 : 79 (b) 31 : 57 (c) 21 : 40 (d) 25 : 61 (e) 27 : 64
- 144.** Total girls appeared in the exam from Rajasthan are what percent less than total boys from that state?
 (a) 24% (b) 25% (c) 30% (d) 32% (e) 28%
- 145.** Find the average number of boys appeared in the exam from Bihar & MP?
 (a) 19260 (b) 19140 (c) 19360 (d) 19280 (e) 19440

Direction (146-150): Study the line graph and table given below carefully and answer the following questions.

Given table shows the units of laptop manufactured by company – A & B in five different years and line chart shows the % of units sold out of total available units of laptop by company - A & B in any of these five years.

Note - Units available for sales in any year = Number of units manufactured in that year + Number of unsold units of previous year.

Year	Units manufactured	
	A	B
2014	1200	2000
2015	880	3900
2016	1300	3400
2017	2025	2100
2018	1550	3000



- 146.** Units of laptops sold by company – A in 2014 and 2015 together is what percent of units of laptops manufactured by company – B in 2014 & 2018 together?
 (a) 39.2% (b) 37.6% (c) 19.8% (d) 26.6% (e) 23.8%
- 147.** Average of units of laptop sold by company – A in 2015 and 2018 is what percent less than units of laptop sold by company – B in 2015 & 2017 together?
 (a) 60% (b) 40% (c) 70% (d) 50% (e) None of the above.
- 148.** Find ratio of units of laptop manufactured by company – B in 2017 & 2018 together to units of laptop sold by company – A in 2016 & 2017 together.
 (a) 68 : 41 (b) 17 : 11 (c) 34 : 21 (d) 68 : 43 (e) None of the above.
- 149.** Find the approximate average of units of laptop sold by company – B in 2014, 2016 and 2018.
 (a) 3000 (b) 2700 (c) 2900 (d) 2600 (e) 2800
- 150.** Unsold units of laptop of company – A in 2018 is how much more or less than unsold units of laptop of company – B in 2018?
 (a) 280 (b) 260 (c) 220 (d) 250 (e) 300

Practice MCQs for Prelims_(Solutions)

1. **(d):** required answer = $1000 \times \left(\frac{10}{100} \times \frac{3}{5} + \frac{15}{100} \times \frac{8}{15} \right) = 140$

2. **(c):** required ratio = $\left(\frac{20}{100} \times 1000 \times \frac{1}{2} \right) + \left(\frac{25}{100} \times 1000 \times \frac{13}{25} \right) : \left(\frac{30}{100} \times 1000 \times \frac{13}{30} \right)$
 $= 23 : 13$

3. **(a):** duffel bags produced by company B = $\frac{10}{100} \times 1000 \times \frac{3}{5} = 60$

Backpacks produced by company D = $\frac{25}{100} \times 1000 \times \frac{13}{25} = 130$

Required % = $\frac{60}{130} \times 100 = 46 \frac{2}{13} \%$

4. **(e):** required average = $\frac{\frac{15}{100} \times 1000 \times \frac{7}{15} + \frac{25}{100} \times 1000 \times \frac{13}{25}}{2} = \frac{200}{2} = 100$

5. **(b):** bags produced by company B & E together = $\frac{10+30}{100} \times 1000 = 400$

Duffel bags produced by company A, D & E together = $\frac{20}{100} \times 1000 \times \frac{1}{2} + \frac{25}{100} \times 1000 \times \frac{12}{25} + \frac{30}{100} \times 1000 \times \frac{13}{30} = 350$
 Required % = $\frac{400}{350} \times 100 = 114\frac{2}{7}\%$

6. (c): Total number of males employees in company E = $5400 \times \frac{22}{100} \times \frac{2}{3} = 792$
 Total number of female employees in company D = $5400 \times \frac{20}{100} \times \frac{3}{5} = 648$
 Required ratio = $\frac{792}{648} = 11 : 9$

7. (a): Total number of male employees in company A = $5400 \times \frac{18}{100} \times \frac{2}{3} = 648$
 Total number of female employees in company E = $5400 \times \frac{22}{100} \times \frac{1}{3} = 396$
 Required percentage = $\frac{648}{396} \times 100 = 163.63\%$
 = 164% (approx.)

8. (b): total male employees in company B, C and D together = $5400 \times \frac{28}{100} \times \frac{3}{4} + 5400 \times \frac{12}{100} \times \frac{1}{3} + 5400 \times \frac{20}{100} \times \frac{2}{5} = 1134 + 216 + 432 = 1782$
 Required percentage = $\frac{1782}{5400} \times 100 = 33\%$

9. (d): Total female employees in all the 5 companies together = $5400 \times \frac{18}{100} \times \frac{1}{3} + 5400 \times \frac{28}{100} \times \frac{1}{4} + 5400 \times \frac{12}{100} \times \frac{2}{3} + 5400 \times \frac{20}{100} \times \frac{3}{5} + 5400 \times \frac{22}{100} \times \frac{1}{3} = 324 + 378 + 432 + 648 + 396 = 2178$

10. (e): Central angle of total employees from company B and D together = $(28+20) \times \frac{360}{100} = 172.8^\circ$

11. (a): Incentive given to HR department = $\frac{35}{100} \times 50000 = \text{Rs } 17500$
 Incentive to each employee in HR = $\frac{17500}{60} = \text{Rs } 291.67$

12. (c): required ratio = $\frac{\frac{15}{100} \times 50000}{80} : \frac{\frac{20}{100} \times 50000}{60} = 9 : 16$

13. (b): required average = $\frac{10+20+20}{100} \times \frac{50000}{3} = 8333.33$

14. (e): per employee incentive in Content department = $\frac{10}{100} \times \frac{50000}{150} = \text{Rs } 33.33$
 Per employee incentive given in HR department = $\frac{35}{100} \times \frac{50000}{60} = \text{Rs } 291.67$
 Required % = $\frac{291.67 - 33.33}{291.67} \times 100 = 88.57\% \approx 89\%$

15. (b): per employee incentive

$$\text{HR} = \frac{35}{100} \times \frac{50000}{60} = \text{Rs } 291.67$$

$$\text{Content} = \frac{10}{100} \times \frac{50000}{150} = \text{Rs } 33.33$$

$$\text{Blogging} = \frac{\frac{15}{100} \times 50000}{80} = \text{Rs } 93.75$$

$$\text{SEO} = \frac{20}{100} \times \frac{50000}{60} = \text{Rs } 166.67$$

$$\text{DTP} = \frac{20}{100} \times \frac{50000}{70} = \text{Rs } 142.86$$

Per employee incentive given is maximum for HR department employees

- Sol (16-20):

Day1

$$\text{No. of male visited on day1} = \frac{1400}{13+15} \times 13 = 650$$

$$\text{No. of female visited} = 1400 - 650 = 750$$

Day2

$$\text{No. of male visited} = \frac{1700}{37+31} \times 37 = 925$$

$$\text{No. of female visited} = 1700 - 925 = 775$$

Day3

$$\text{No. of male visited} = \frac{1200}{13+12} \times 13 = 624$$

$$\text{No. of female visited} = 1200 - 624 = 576$$

Day4

$$\text{No. of male visited} = \frac{1500}{7+8} \times 7 = 700$$

$$\text{No. of female visited} = 1500 - 700 = 800$$

Day5

$$\text{No. of male visited} = \frac{800}{11+5} \times 11 = 550$$

$$\text{No. of female visited} = 800 - 550 = 250$$

16. (b): required percentage = $\frac{925-250}{250} \times 100 = 270\%$

17. (e): average no. of people of five days of week = $\frac{1400+1700+1200+1500+800}{5} = 1320$

So, in 2 days of week no. of people visited are less than average no. of people.

18. (c): required value = $\sqrt{576} = 24$

19. (c): required ratio = $\frac{750+775+800}{3} : \frac{925+700}{2} = \frac{2325}{3} : \frac{1625}{2} = 62 : 65$

20. (b): total no. of male visited on day3 = $624 + 650 \times \frac{4}{100} = 650$

$$\text{Total no. of female visited on day3} = \frac{650}{13} \times 12 = 600$$

$$\text{Required no. of female} = 600 - 576 = 24$$

21. (a): Total 8 GB mobile phones sold by A = $(4000 + 3000) \times \frac{40}{100} - 4000 \times \frac{45}{100} = 1000$

$$\text{Total 8 GB mobile phones sold by B} = (6000 + 4000) \times \frac{80}{100} - 6000 \times \frac{2}{3} = 4000$$

$$\text{Required percentage} = \frac{(1000+4000)}{10000} \times 100 = 50\%$$

22. (c): Total unsold mobiles by B & C = $(6000 + 4000) \times \frac{20}{100} + (5000 + 4000) \times \frac{40}{100}$
 $= 2000 + 3600 = 5600$
 Average = $\frac{5600}{2} = 2800$

Total sold mobiles by C = $(5000 + 4000) \times \frac{60}{100} = 5400$

Required difference = $5400 - 2800 = 2600$

23. (d): Total 8GB mobiles sold by A = $(4000 + 3000) \times \frac{40}{100} \times \frac{2}{7} = 800$

Total 8GB mobiles sold by C = $(5000 + 4000) \times \frac{60}{100} \times \frac{4}{9} = 2400$

Required sum = $800 + 2400 = 3200$

24. (a): Total unsold mobiles by A = $(4000 + 3000) \times \frac{60}{100} = 4200$

Total unsold mobiles by B = $(6000 + 4000) \times \frac{20}{100} = 2000$

Required percentage

$= \frac{4200 - 2000}{2000} \times 100 = 110\%$

25. (d): Total sold mobiles by A
 $= (4000 + 3000) \times \frac{40}{100} = 2800$

Total sold mobiles by B = $(6000 + 4000) \times \frac{80}{100} = 8000$

Total sold mobiles by C = $(5000 + 4000) \times \frac{60}{100} = 5400$

Required average = $\frac{2800 + 8000 + 5400}{3} = \frac{16200}{3} = 5400$

26. (c): Male employees who are promoted in A = $(400 + 350) \times \frac{40}{100} \times \frac{2}{5} = 120$

Male employees who are promoted in B = $120 \times \frac{200}{100} = 240$

Female employees who are not promoted in A = $350 - \left((400 + 350) \times \frac{40}{100} - 120 \right) = 170$

Female employees who are not promoted in B = $100 - \left((260 + 100) \times \frac{80}{100} - 240 \right) = 52$

Required number of employees = $170 + 52 = 222$

27. (a): Promoted employees in C & E together = $\left((340 + 410) \times \frac{60}{100} \right) + \left((240 + 360) \times \frac{50}{100} \right)$
 $= 450 + 300 = 750$

Average number of employees in A & D = $\frac{1}{2} \times ((400 + 350) + (200 + 300)) = 625$

Required ratio = $\frac{750}{625} = 6 : 5$

28. (c): Female employees who are promoted in E = $\left((240 + 360) \times \frac{50}{100} \right) - 200 = 100$

Female employees who are promoted in C = $100 \times \frac{160}{100} = 160$

Male employees who are promoted in C = $\left((340 + 410) \times \frac{60}{100} \right) - 160 = 290$

Required % = $\frac{200 + 290}{200 + 300} \times 100 = 98\%$

29. (e): Employees who are promoted in A, B & D together
 $= \left((400 + 350) \times \frac{40}{100} \right) + \left((260 + 100) \times \frac{80}{100} \right) + \left((200 + 300) \times \frac{80}{100} \right)$
 $= 300 + 288 + 400 = 988$

Female employees in B, C & D together = $100 + 410 + 300 = 810$

Required difference = $988 - 810 = 178$

30. (b): Promoted employees in E whose age is less than or equal to 50 years

$= \left((240 + 360) \times \frac{50}{100} \right) \times \frac{(100 - 21)}{100} = 237$

Male employees in B & E together = $260 + 240 = 500$

Required % = $\frac{500 - 237}{500} \times 100 = 52.6\%$

31. (b): Non - defective fans manufactured by A
 $= \left(20,000 \times \frac{25}{100} \right) - 500 = 4500$

Total fans manufactured by C = $\left(20,000 \times \frac{20}{100} \right) = 4000$

Required % = $\frac{4500 - 4000}{4000} \times 100 = 12.5\%$

$$\begin{aligned}
 \text{32. (e): Non - defective fans manufactured by E} &= (20,000 \times \frac{30}{100}) - 900 \\
 &= 5100 \\
 \text{Defective fans manufactured by A, B \& C together} &= 500 + 600 + 800 \\
 &= 1900 \\
 \text{Required difference} &= 5100 - 1900 \\
 &= 3200
 \end{aligned}$$

$$\begin{aligned}
 \text{33. (a): Total cost of manufacturing fans for D} &= (20,000 \times \frac{10}{100}) \times 100 \\
 &= \text{Rs.} 2,00,000 \\
 \text{Total revenue that D wants} &= 2,00,000 \times \frac{120}{100} \\
 &= \text{Rs.} 2,40,000 \\
 \text{Non-defective fans of D} &= (20,000 \times \frac{10}{100}) - 500 \\
 &= 1500 \\
 \text{Required selling price} &= \frac{2,40,000}{1500} \\
 &= \text{Rs.} 160
 \end{aligned}$$

$$\begin{aligned}
 \text{34. (d): Required central angle} &= (\frac{25+20}{100}) \times 360 \\
 &= 162^\circ
 \end{aligned}$$

$$\begin{aligned}
 \text{35. (a): Coolers manufactured by E} &= (20,000 \times \frac{30}{100}) \times \frac{7}{5} \\
 &= 8400 \\
 \text{Non-defective fans manufactured by C} &= (20,000 \times \frac{20}{100}) - 800 \\
 &= 3200 \\
 \text{Required difference} &= 8400 - 3200 \\
 &= 5200
 \end{aligned}$$

$$\begin{aligned}
 \text{36. (e): Non-defective fans manufactured by B} &= (20,000 \times \frac{15}{100}) - 600 \\
 &= 2400 \\
 \text{Required ratio} &= \frac{900}{2400} \\
 &= 3 : 8
 \end{aligned}$$

$$\begin{aligned}
 \text{37. (a): Total girls in A \& D} &= 2000 \times \frac{30}{100} - 320 + \\
 &2000 \times \frac{25}{100} - 360 \\
 &= 280 + 140 \\
 &= 420 \\
 \text{Total boys in A \& C} &= 320 + 280 \\
 &= 600 \\
 \text{Required difference} &= 600 - 420 = 180
 \end{aligned}$$

$$\begin{aligned}
 \text{38. (b): Total girls in C} &= 2000 \times \frac{25}{100} - 280 = 220 \\
 \text{Total students in B} &= 2000 \times \frac{20}{100} = 400 \\
 \text{Required percentage} &= \frac{400-220}{400} \times 100 \\
 &= \frac{180}{400} \times 100 \\
 &= 45\%
 \end{aligned}$$

$$\begin{aligned}
 \text{39. (e): Total girls in A \& C} &= 2000 \times \frac{30}{100} - 320 + 2000 \\
 &\times \frac{25}{100} - 280 \\
 &= 280 + 220 \\
 &= 500
 \end{aligned}$$

$$\text{Required Central angle} = \frac{500}{2000} \times 100 \times \frac{360}{100} = 90^\circ$$

$$\begin{aligned}
 \text{40. (e): Total boys in 'X'} &= [2000 \times \frac{20}{100} - 180] + 20 \\
 &= 220 + 20 = 240
 \end{aligned}$$

$$\text{Total girls in 'X'} = 240 \times \frac{40}{60} = 160$$

$$\begin{aligned}
 \text{Total girls in D} &= 2000 \times \frac{25}{100} - 360 \\
 &= 500 - 360 \\
 &= 140
 \end{aligned}$$

$$\text{Required ratio} = \frac{140}{160} = 7 : 8$$

$$\begin{aligned}
 \text{41. (c): Total boys in E} &= [2000 \times \frac{30}{100} - 320] \times \frac{125}{100} \\
 &= (600 - 320) \times \frac{125}{100} \\
 &= 350
 \end{aligned}$$

$$\text{In school E, boys : girls :: 7 : 3}$$

$$\text{Number of girls in E} = 150$$

$$\begin{aligned}
 \text{Total number of girls in D} &= 2000 \times \frac{25}{100} - 360 \\
 &= 500 - 360 \\
 &= 140
 \end{aligned}$$

$$\begin{aligned}
 \text{Required average} &= \frac{150+140}{2} \\
 &= \frac{290}{2} = 145
 \end{aligned}$$

$$\begin{aligned}
 \text{42. (e): Total saving of P} &= 4000 \times \frac{60^\circ}{360^\circ - (60^\circ + 60^\circ + 80^\circ + 80^\circ)} \\
 &= 4000 \times \frac{60^\circ}{80^\circ} = 3000 \text{ Rs.}
 \end{aligned}$$

$$\text{Total income of P} = 3000 \times \frac{100}{20} = 15000 \text{ Rs.}$$

$$\text{Total income of T} = 4000 \times \frac{100}{20} = 20000 \text{ Rs.}$$

$$\begin{aligned}
 \text{Required ratio} &= 15000 : 20000 \\
 &= 3 : 4
 \end{aligned}$$

$$\begin{aligned}
 \text{43. (b): Total saving of Q} &= 4000 \times \frac{60^\circ}{360^\circ - (60^\circ + 60^\circ + 80^\circ + 80^\circ)} \\
 &= 4000 \times \frac{60^\circ}{80^\circ} = 3000 \text{ Rs.}
 \end{aligned}$$

$$\text{Total expenditure of Q} = 3000 \times \frac{75}{25} = 9000 \text{ Rs.}$$

$$\text{Total saving of R} = 4000 \times \frac{80^\circ}{360^\circ - (60^\circ + 60^\circ + 80^\circ + 80^\circ)}$$

$$= 4000 \times \frac{80^\circ}{80^\circ} = 4000 \text{ Rs.}$$

$$\text{Total expenditure of R} = 4000 \times \frac{60}{40} = 6000 \text{ Rs.}$$

$$\begin{aligned}
 \text{Required percentage} &= \frac{9000-6000}{6000} \times 100 \\
 &= \frac{3000}{6000} \times 100 = 50\%
 \end{aligned}$$

$$\begin{aligned}
 \text{44. (c): Total saving of R} &= 4000 \times \frac{80^\circ}{360^\circ - (60^\circ + 60^\circ + 80^\circ + 80^\circ)} \\
 &= 4000 \times \frac{80^\circ}{80^\circ} = 4000 \text{ Rs.} \\
 \text{Income of R} &= 4000 \times \frac{100}{40} = 10000 \text{ Rs.}
 \end{aligned}$$

$$\begin{aligned}\text{Total saving of S} &= 4000 \times \frac{80^\circ}{360^\circ - (60^\circ + 60^\circ + 80^\circ + 80^\circ)} \\ &= 4000 \times \frac{80^\circ}{80^\circ} = 4000 \text{ Rs} \\ \text{Total income of S} &= 4000 \times \frac{100}{50} = 8000 \text{ Rs.} \\ \text{Required average} &= \frac{10000 + 8000}{2} = 9000 \text{ Rs.}\end{aligned}$$

45. (d): Total saving of R = $4000 \times \frac{80^\circ}{360^\circ - (60^\circ + 60^\circ + 80^\circ + 80^\circ)}$
 $= 4000 \times \frac{80^\circ}{80^\circ} = 4000 \text{ Rs.}$
 Income of R = $4000 \times \frac{100}{40} = 10000 \text{ Rs.}$
 Income of A = $10000 \times \frac{240}{100} = 24000 \text{ Rs.}$
 Total saving of S = $4000 \times \frac{80^\circ}{360^\circ - (60^\circ + 60^\circ + 80^\circ + 80^\circ)}$
 $= 4000 \times \frac{80^\circ}{80^\circ} = 4000 \text{ Rs}$
 Total saving of A = $4000 \times \frac{200}{100} = 8000 \text{ Rs.}$
 Total expenditure of A = $24000 - 8000 = 16000 \text{ Rs.}$
 Required percentage = $\frac{16000}{24000} \times 100 = 66\frac{2}{3}\%$

46. (e): Total saving of P = $4000 \times \frac{60^\circ}{360^\circ - (60^\circ + 60^\circ + 80^\circ + 80^\circ)}$
 $= 4000 \times \frac{60^\circ}{80^\circ} = 3000 \text{ Rs.}$
 Total income of P = $3000 \times \frac{100}{20} = 15000 \text{ Rs.}$
 Total saving of Q = $4000 \times \frac{60^\circ}{360^\circ - (60^\circ + 60^\circ + 80^\circ + 80^\circ)}$
 $= 4000 \times \frac{60^\circ}{80^\circ} = 3000 \text{ Rs.}$
 Total income of Q = $3000 \times \frac{100}{25} = 12000 \text{ Rs.}$
 Required percentage = $\frac{15000 - 12000}{15000} \times 100$
 $= \frac{3000}{15000} \times 100 = 20\%$

47. Ans. (c): Unsold chairs of A & D together in 2016 =
 $(1200 - 840) + (900 - 810)$
 $= 360 + 90 = 450$
 Required % = $\frac{450}{1080 + 720} \times 100 = 25\%$

48. Ans. (a): Total manufacturing cost of chairs for D in 2016 = 200×900
 $= \text{Rs.} 1,80,000$
 Total manufacturing cost of chairs for D in 2017 =
 200×1200
 $= \text{Rs.} 2,40,000$
 Total revenue from chairs for D in 2016 =
 250×810
 $= \text{Rs.} 2,02,500$
 Total revenue from chairs for D in 2017 =
 400×720
 $= \text{Rs.} 2,88,000$
 Profit % of D in 2016 = $\frac{202500 - 180000}{180000} \times 100$
 $= 12.5\%$
 Profit % of D in 2017 = $\frac{288000 - 240000}{240000} \times 100$
 $= 20\%$
 So, profit% is maximum in 2017 for D.

49. (d): Required ratio = $\frac{1200 + 600}{900 + 720}$
 $= \frac{1800}{1620}$
 $= 10 : 9$

50. (b): Chairs manufactured by A in 2018 = $\frac{150}{100} \times 900$
 $= 1350$
 Chairs sold by A in 2018 = $1350 \times \frac{2}{3}$
 $= 900$
 Required average = $\frac{840 + 1440 + 900}{3}$
 $= 1060$

51. (a): Average number of chairs sold by A, B, C & D in 2016 = $\frac{840 + 900 + 570 + 810}{4}$
 $= 780$
 Total unsold chairs of A, B, C & D together in 2017 =
 $160 + 120 + 100 + 480$
 $= 860$
 Required difference = $860 - 780$
 $= 80$

52. (b): Total number of qualified SSC students from P and R = $3400 \times \frac{40}{100} + 2600 \times \frac{55}{100} = 2790$
 Total number of qualified SSC students from S and U = $3400 \times \frac{40}{100} + 2800 \times \frac{40}{100} = 2480$
 Required ratio = $\frac{2790}{2480} = \frac{279}{248}$

53. (c): total students qualified in banking from R, S and T = $(2400 \times \frac{40}{100}) + (2800 \times \frac{25}{100}) + (2600 \times \frac{55}{100})$
 $= 3090$
 Required average = $\frac{3090}{3} = 1030$

54. (b): Total qualified students of banking exam from P, Q and T = $(2900 \times \frac{70}{100}) + (2300 \times \frac{55}{100}) + (2600 \times \frac{55}{100}) = 4725$
 Total qualified students of SSC exam from P, Q and T = $(3400 \times \frac{40}{100}) + (3000 \times \frac{25}{100}) + (2200 \times \frac{25}{100}) = 2660$
 Required difference = $4725 - 2660 = 2065$

55. (d): Total Banking students who qualified from R and S = $2400 \times \frac{40}{100} + 2800 \times \frac{25}{100} = 1660$
 Total SSC students who qualified from Q and U = $3000 \times \frac{25}{100} + 2800 \times \frac{40}{100} = 1870$
 Difference = $1870 - 1660 = 210$

56. (d): Total qualified SSC students from all cities = $(3400 \times \frac{40}{100}) + (3000 \times \frac{25}{100}) + (2600 \times \frac{55}{100}) + (3400 \times \frac{40}{100}) + (2200 \times \frac{25}{100}) + (2800 \times \frac{40}{100})$
 $= 6570$

57. (a): Total male visited park on Tuesday & Wednesday
 $= (150 - 66) + (140 - 64)$
 $= 84 + 76 = 160$
 Total female visited park on Wednesday & Friday
 $= 64 + 46 = 110$
 Required ratio $= 64 + 46 = 110$
 Required ratio $= 160 : 110 = 16 : 11$

58. (b): Total male visited Sunday $= (110 - 52) + 22 = 80$
 Total people visited park on Sunday $= 80 \times \frac{3}{2} = 120$
 Total male visited on Friday $= (130 - 46) = 84$
 Required percentage $= \frac{120 - 84}{120} \times 100$
 $= \frac{36}{120} \times 100 = 30\%$

59. (d): Average number of males visited park on Monday & Friday
 $= \frac{(110-52)+(130-46)}{2}$
 $= \frac{58+84}{2} = 71$
 Average number of females visited park on Tuesday & Wednesday
 $= \frac{66+64}{2}$
 $= 65$
 Required difference $= 71 - 65 = 6$

60. (c): Total male visited on Tuesday $= 150 - 66 = 84$
 Total male visited on Wednesday $= 140 - 64 = 76$
 Required percentage $= \frac{84-76}{84} \times 100$
 $= \frac{8}{84} \times 100 \approx 9.5\%$

61. (b): Total people visited on Saturday $= 110 + 110$
 $\times \frac{1}{11} = 120$
 Required percentage $= \frac{150-120}{120} \times 100$
 $= \frac{30}{120} \times 100 = 25\%$

Sol. (62-66): We will solve by this type in each question

Let X type car produced in 2011 $= x$
 \Rightarrow Y type car produced in 2011 $= 1.25x$
 ATQ,

$$x + 1.25x = 720$$

$$\Rightarrow x = 320$$

Y type car produced in 2011 $= 1.25 \times 320 = 400$

In Short

In 2011

$$100 + 125 \rightarrow 720$$

$$\Rightarrow 125 \rightarrow \frac{720}{225} \times 125 = 400$$

62. (c): Y type car produced in 2011 $= 1.25 \times 320 = 400$

In 2012

$$100 + 140 \rightarrow 960$$

$$\Rightarrow 140 \rightarrow \frac{960}{240} \times 140 = 560$$

In 2014

$$100 + 110 \rightarrow 1260$$

$$\Rightarrow 110 \rightarrow \frac{1260}{210} \times 110 = 660$$

In 2016

$$100 + 135 \rightarrow 940$$

$$\Rightarrow 135 \rightarrow \frac{940}{235} \times 135 = 540$$

Total Y type car produced in 2011 and 2012 together $= 400 + 560 = 960$

Total Y type car produced in 2014 and 2016 together $= 660 + 540 = 1200$

$$\text{Required}\% = \frac{960}{1200} \times 100$$

$$= 80\%$$

63. (d): In 2011

$$100 + 125 \rightarrow 720$$

$$\Rightarrow 100 \rightarrow \frac{720}{225} \times 100 = 320$$

In 2012

$$100 + 140 \rightarrow 960$$

$$\Rightarrow 100 \rightarrow \frac{960}{240} \times 100 = 400$$

In 2013

$$100 + 150 \rightarrow 1100$$

$$\Rightarrow 100 \rightarrow \frac{1100}{250} \times 100 = 440$$

In 2015

$$100 + 140 \rightarrow 1320$$

$$\Rightarrow 100 \rightarrow \frac{1320}{240} \times 100 = 550$$

$$\text{Required ratio} = \frac{320+400}{440+550} = \frac{720}{990} = \frac{8}{11}$$

64. (b): In 2016,

Let X type car produced $= x$

\Rightarrow Y type car produced $= 1.35x$

ATQ,

$$x + 1.35x = 940$$

$$\Rightarrow x = \frac{940}{2.35} = 400$$

$$1.35x = 540$$

Total cars produced in 2017

$$= 940 \times \frac{135}{100}$$

$$= 1269$$

X type car produced in 2017

$$= 400 \times \frac{162}{100}$$

$$= 648$$

Y type car produced in 2017

$$= 1269 - 648$$

$$= 621$$

$$\text{Required \%} = \frac{621-540}{540} \times 100$$

$$= \frac{81}{540} \times 100 = 15\%$$

65. (e): In 2011
 $\Rightarrow 100 + 125 \rightarrow 720$
 $\Rightarrow 125 \rightarrow \frac{720}{225} \times 125 = 400$
 In 2013
 $\Rightarrow 100 + 150 \rightarrow 1100$
 $\Rightarrow 150 \rightarrow \frac{1100}{250} \times 150 = 660$
 In 2015
 $100 + 140 \rightarrow 1320$
 $\Rightarrow 140 \rightarrow \frac{1320}{240} \times 140 = 770$
 $\text{Required average} = \frac{400+660+770}{3} = \frac{1830}{3} = 610$

66. (b): In 2012
 $100 + 140 \rightarrow 960$
 $\Rightarrow 140 \rightarrow \frac{960}{240} \times 140 = 560$
 In 2014
 $100 + 110 \rightarrow 1260$
 $\Rightarrow 110 \rightarrow \frac{1260}{210} \times 110 = 660$
 Non-defective Y type cars produced in 2012 and 2014 together
 $= 560 \times \frac{80}{100} + 660 \times \frac{70}{100}$
 $= 448 + 462$
 $= 910$

67. (b): Total number of students who passed with first division from states D and E together
 $= 16,00,000 \times \frac{30}{100} \times \frac{40}{100} \times \frac{50}{100} + 16,00,000 \times \frac{20}{100} \times \frac{55}{100} \times \frac{75}{100}$
 $= 96,000 + 1,32,000$
 $= 2,28,000$
 Total number of students who passed with first division from states A and C together
 $= 16,00,000 \times \frac{12.5}{100} \times \frac{80}{100} \times \frac{25}{100} + 16,00,000 \times \frac{20}{100} \times \frac{50}{100} \times \frac{35}{100}$
 $= 40,000 + 56,000$
 $= 96,000$
 $\text{Required percentage} = \frac{2,28,000 - 96,000}{96,000} \times 1000$
 $= \frac{1,32,000}{96,000} \times 100 = 137.5\%$

68. (e): Total number of students failed in exam 'D'
 $= 16,00,000 \times \frac{30}{100} \times \frac{60}{100} = 2,88,000$
 Total number of students failed in exam 'B'
 $= 16,00,000 \times \frac{17.5}{100} \times \frac{25}{100} = 70,000$
 Required difference
 $= 2,88,000 - 70,000 = 2,18,000$

69. (d): Total students who passed exam 'C' but did not secured first division
 $= 16,00,000 \times \frac{20}{100} \times \frac{50}{100} \times \frac{65}{100} = 1,04,000$

Let total number of students who got third division = $100x$
 Total number of students who got second division
 $= \frac{30}{100} \times 100x = 30x$
 ATQ,
 $100x + 30x = 1,04,000$
 $x = \frac{1,04,000}{130} = 800$
 Total number of students who got second division
 $= 30 \times 800 = 24,000$

70. (d): Total number of students failed in exam 'A' and 'C' together
 $= 16,00,000 \times \frac{1}{8} \times \frac{20}{100} + 16,00,000 \times \frac{20}{100} \times \frac{50}{100}$
 $= 40,000 + 1,60,000 = 2,00,000$
 Total number of students passed in exam 'E'
 $= 16,00,000 \times \frac{20}{100} \times \frac{55}{100} = 1,76,000$
 Required Ratio = $\frac{2,00,000}{1,76,000} = \frac{25}{22}$

71. (c): Total number of passed students who doesn't get first division in exam 'B'
 $= 16,00,000 \times \frac{17.5}{100} \times \frac{75}{100} \times \frac{60}{100} = 1,26,000$
 Total number of students who get first division in exam 'D'
 $= 16,00,000 \times \frac{30}{100} \times \frac{40}{100} \times \frac{50}{100} = 96,000$
 Required % = $\frac{1,26,000 - 96,000}{96,000} \times 100 = \frac{30,000}{96,000} \times 100$
 $= 31.25\%$

72. (a): No. of students who paid fees through credit card in 2013 and 2014 together
 $= 12,00,000 \times \left[\frac{16}{100} \times \frac{62.5}{100} + \frac{24}{100} \times \frac{75}{100} \right]$
 $= 120 \times [1000 + 1800]$
 $= 3,36,000$
 No. of students who paid fees through debit card in 2015 and 2016 together.
 $= 12,00,000 \times \left[\frac{20}{100} \times \frac{62.5}{100} + \frac{15}{100} \times \frac{42.5}{100} \right]$
 $= 120 \times [1250 + 637.5]$
 $= 2,26,500$
 Required difference = $3,36,000 - 2,26,500 = 1,09,500$

73. (c): No. of students who paid through debit card in 2012
 $= \frac{1}{2} \times 12,00,000 \times \left[\frac{15}{100} \times \frac{42.5}{100} + \frac{25}{100} \times \frac{20}{100} \right]$
 $= 60 \times [637.5 + 500]$
 $= 68,250$
 \therefore Total number of students in 2012
 $= 68,250 \times \frac{3}{2} = 1,02,375$

74. (d): Required % = $\frac{12,00,000 \times \frac{25}{100} \times \frac{80}{100}}{12,00,000 \times \frac{20}{100} \times \frac{62.5}{100}} \times 100 = 160\%$

75. (b): Required Avg. = $\frac{1}{3} \times 12,00,000 \left[\frac{16}{100} \times \frac{37.5}{100} + \frac{24}{100} \times \frac{25}{100} + \frac{15}{100} \times \frac{42.5}{100} \right] = 73500$

76. (e): Required amount = $12,00,000 \times \left[\frac{20}{100} \times \frac{37.5}{100} + \frac{25}{100} \times \frac{80}{100} \right] \times 20$
 $= 120 \times 2750 \times 20 = \text{Rs. } 66,00,000$

77. (d): Let number of girls in Mech. be = $100x$
 \Rightarrow number of boys in Mech. = $130x$
 ATQ,
 $100x + 130x = 805$
 $\Rightarrow 230x = 805$
 $\Rightarrow x = \frac{805}{230} = 3.5$
 Number of boys in Mech. = $3.5 \times 130 = 455$
 Let number of girls in IT be = $100y$
 \Rightarrow number of boys in IT = $120y$
 ATQ,
 $100y + 120y = 990$
 $\Rightarrow 220y = 990$
 $\Rightarrow y = 4.5$
 number of girls in IT = $4.5 \times 100 = 450$
 Required difference = $455 - 450 = 5$

78. (a): Let number of girls in Civil = $100x$
 \Rightarrow Number of boys in Civil = $140x$
 ATQ,
 $100x + 140x = 672$
 $\Rightarrow 240x = 672$
 $\Rightarrow x = 2.8$
 Total number of girls in Civil = 280
 Let number of girls in CSE = $100y$
 \Rightarrow number of boys in CSE = $125y$
 ATQ,
 $100y + 125y = 900$
 $\Rightarrow 225y = 900$
 $\Rightarrow y = 4$
 Total number of girls in CSE = $4 \times 100 = 400$
 Let number of girls in ECE be $100z$
 \Rightarrow Number of boys in ECE = $145z$
 ATQ,
 $100z + 145z = 784$
 $\Rightarrow z = 3.2$
 Total number of girls in ECE = 320
 Required average = $\frac{280+400+320}{3} = \frac{1000}{3}$

79. (d): Let number of girls in Biotech be = $100x$
 \Rightarrow number of boys in Biotech = $135x$
 ATQ,
 $100x + 135x = 705$
 $\Rightarrow 235x = 705$
 $\Rightarrow x = 3$
 Total number of boys in Biotech = 405
 Number of girls in Biotech = 300
 Required % = $\frac{300 \times \frac{60}{100}}{405 \times \frac{60}{100}} \times 100 = 74 \frac{2}{27} \%$

80. (b): Number of students from CSE who got placed in TCS = $75 \times \frac{900}{100} = 675$
 Number of students from IT who got placed in IT = $60 \times \frac{990}{100} = 594$
 Total number of CSE & IT students placed in TCS = 1269
 Total number of students placed in TCS from that college = $1269 \times \frac{4}{3} = 1692$
 Total number of boys from CSE and IT placed in TCS = $(675 - 350) + (594 - 990 \times 0.3) = 622$
 Required part = $\frac{622}{1692} = \frac{311}{846}$

81. (b): Let number of girls in Mech. = $100x$
 \Rightarrow Total number of boys in Mech. = $130x$
 ATQ,
 $100x + 130x = 805$
 $\Rightarrow 230x = 805$
 $\Rightarrow x = 3.5$
 Total number of girls in Mech. = 350
 Let number of girls in Civil = $100y$
 \Rightarrow Number of boys in Civil = $140y$
 ATQ,
 $100y + 140y = 672$
 $\Rightarrow 240y = 672$
 $\Rightarrow y = 2.8$
 Total number of girls in Civil = 280
 Required % = $\frac{350-280}{280} \times 100 = 25\%$

82. (d): Total population of city A
 $= \frac{2400}{100 - (16+14+12+18+10+20)} \times 16 = 3840$
 Total population of city B
 $= \frac{2400}{100 - (16+14+12+18+10+20)} \times 14 = 3360$
 Total population of city C
 $= \frac{2400}{100 - (16+14+12+18+10+20)} \times 12 = 2880$
 Average population of cities A, B & C
 $= \frac{3840+3360+2880}{3} = 3360$
 Total population of city D
 $= \frac{2400}{100 - (16+14+12+18+10+20)} \times 18 = 4320$
 Total population of city E
 $= \frac{2400}{100 - (16+14+12+18+10+20)} \times 10 = 2400$
 Total population of city F
 $= \frac{2400}{100 - (16+14+12+18+10+20)} \times 20 = 4800$
 Average population of D, E & F
 $= \frac{4320+2400+4800}{3} = 3840$
 Required percentage = $\frac{3840-3360}{3840} \times 100 = 12.5\%$

- 83. (c):** Total population of city A

$$= \frac{2400}{100 - (16 + 14 + 12 + 18 + 10 + 20)} \times 16 \times 1.5 = 5760$$
 Total population of city B

$$= \frac{2400}{100 - (16 + 14 + 12 + 18 + 10 + 20)} \times 14 \times 0.75 = 2520$$
 Total population of A & B = 5760 + 2520 = 8280
 Total literate population of city D

$$= \frac{2400}{100 - (16 + 14 + 12 + 18 + 10 + 20)} \times 18 \times \frac{75}{100} = 3240$$
 Total literate population of city F

$$= \frac{2400}{100 - (16 + 14 + 12 + 18 + 10 + 20)} \times 20 \times \frac{52}{100} = 2496$$
 Total literate population of city D & F = 3240 + 2496 = 5736
 Required percentage = $\frac{8280}{5736} \times 100$
 = 144.35 \approx 144%
- 84. (b):** Total illiterate population of B

$$= \frac{2400}{100 - (16 + 14 + 12 + 18 + 10 + 20)} \times 14 \times \frac{1}{2} = 1680$$
 Total illiterate population of D

$$= \frac{2400}{100 - (16 + 14 + 12 + 18 + 10 + 20)} \times \frac{25}{100} = 1080$$
 Total literate population of A

$$= \frac{2400}{100 - (16 + 14 + 12 + 18 + 10 + 20)} \times 16 \times \frac{60}{100} = 2304$$
 Total literate population of F =

$$= \frac{2400}{100 - (16 + 14 + 12 + 18 + 10 + 20)} \times 20 \times \frac{52}{100} = 2496$$
 Required difference = (2304 + 2496) - (1680 + 1080) = 2040
- 85. (e):** Total literate female in the city C =

$$\frac{2400}{100 - (16 + 14 + 12 + 18 + 10 + 20)} \times 12 \times \frac{65}{100} \times \frac{11}{24} = 858$$
 Total literate female in the city G = 2400

$$\times \frac{68}{100} \times \frac{11}{16}$$

 = 1122
 Required difference = 1122 - 858 = 264
- 86. (d):** Since we don't know the gender distribution of given city or any of given city, then we can not determine the given percentage.
- 87. (c):** Total number of students who got placed in google from IT.

$$= \left(\frac{80}{360} \times 900 \right) \times \frac{35}{100} \times \frac{70}{100}$$

 = 49
 Similarly number of students who got placed in google from ECE

$$= \left(\frac{90}{360} \times 900 \right) \times \frac{60}{100} \times \frac{40}{100}$$

 = 54
 Required no. \rightarrow 49 + 54 = 103
- 88. (a):** Number of students who got Campus placement from ECE

$$= \frac{20}{100} \times \frac{90}{360} \times 900 = 45$$

Total number of students who got placed from ECE

$$= \frac{60}{100} \times \frac{90}{360} \times 900 = 135$$
 Number of students who got placement in google from ECE

$$= \frac{40}{100} \times \frac{60}{100} \times \frac{90}{360} \times 900$$

 = 54
 Number of students who got placement, but not in google
 = 135 - 54
 = 81
 Required ratio is :
 45 : 81
 = 5 : 9

- 89. (d):** Number of students who got placed in google from CSE

$$= \frac{10}{100} \times \frac{40}{100} \times \frac{110}{360} \times 900$$

 = 11
 Number of students who got placed in google from IT

$$= \frac{70}{100} \times \frac{35}{100} \times \frac{80}{360} \times 900$$

 = 49
 Number of students who got placed in google from ECE

$$= \frac{40}{100} \times \frac{60}{100} \times \frac{90}{360} \times 900$$

 = 54
 Number of students who got placed in google from Mechanical

$$= \frac{40}{100} \times \frac{45}{100} \times \frac{80}{360} \times 900$$

 = 36
 Total no. of students who got placement in google = 150
 Required % = $\frac{150}{900} \times 100 = 16 \frac{2}{3}\%$
- 90. (e):** Students who got placement in Google from CSE

$$= \frac{10}{100} \times \frac{40}{100} \times \frac{110}{360} \times 900$$

 = 11
 Students who remains unplaced from Mechanical

$$= \frac{55}{100} \times \frac{80}{360} \times 900$$

 = 110
 Required difference = 110 - 11 = 99
- 91. (d):** Total number of students who got placement in CSE

$$= \frac{40}{100} \times \frac{110}{360} \times 900$$

 = 110
 Number of students who remains unplaced

$$= \frac{110}{360} \times 900 - 110$$

 = 165

Number of new students who got placed

$$= \frac{20}{100} \times 165$$

$$= 33$$

Total number of students placed from CSE

$$= 110 + 33 = 143$$

No. of students who got placed in google from CSE

$$= \frac{10}{100} \times 110$$

$$= 11$$

$$\text{Required \%} = \frac{11}{143} \times 100 = 7.69\%$$

92. (d): Number of females (18 – 30) who voted for NDA

$$= \frac{40}{100} \times \frac{63}{100} \times 3,00,000 \times \frac{4}{9}$$

$$= 33600$$

$$\text{Number of males who voted for UPA} = \frac{150}{100} \times$$

$$33600$$

$$= 50400$$

Total female voters who voted for UPA

$$= \frac{30}{100} \times 3,00,000 - 50400$$

$$= 39600$$

$$\text{Required ratio} = \frac{50400}{39600} = \frac{14}{11}$$

$$= 14 : 11$$

93. (a): Total voters above 60 years of age = $\frac{10}{100} \times$

$$3,00,000$$

$$= 30,000$$

Total male voters above 60 years of age

$$= 30,000 \times \frac{8}{15}$$

$$= 16000$$

Total female voters above 60 years of age

$$= 30000 - 16000 = 14000$$

Total male voters above 60 years who voted for

$$\text{NDA} = 3,00,000 \times \frac{63}{100} \times \frac{10}{100} \times \frac{11}{20}$$

$$= 10395$$

Total female voters above 60 years who voted for

$$\text{NDA} = 3,00,000 \times \frac{63}{100} \times \frac{10}{100} \times \frac{9}{20}$$

$$= 8505$$

Total male voters above 60 years who voted for

$$\text{others} = 30,000 \times \frac{25}{100} \times \frac{2}{5}$$

$$= 3000$$

Total female voters above 60 years who voted for

$$\text{others} = 30,000 \times \frac{25}{100} \times \frac{3}{5}$$

$$= 4500$$

$$\text{Required answer} = 14000 - 8505 - 4500$$

$$= 995$$

94. (e): Number of females (31 – 45) voted for NDA

$$= 3,00,000 \times \frac{63}{100} \times \frac{30}{100} \times \frac{8}{15} = 30,240$$

Number of males (46 – 60) voted for NDA

$$= 3,00,000 \times \frac{63}{100} \times \frac{20}{100} \times \frac{8}{15} = 20,160$$

$$\text{Required \%} = \frac{(30,240 - 20,160)}{20,160} \times 100$$

$$= \frac{10,080}{20,160} \times 100$$

$$= 50\%$$

Or,

$$\text{Required \%} = \frac{3,00,000 \times \frac{63}{100} \times \frac{8}{15} (30 - 20)}{3,00,000 \times \frac{63}{100} \times \frac{8}{15} \times 20} \times 100$$

$$= \frac{10}{20} \times 100$$

$$= 50\%$$

95. (c): Total number of males who voted for NDA

$$= 3,00,000 \times \frac{63}{100} \left[\left(\frac{40}{100} \times \frac{5}{9} \right) + \left(\frac{30}{100} \times \frac{7}{15} \right) + \left(\frac{20}{100} \times \frac{8}{15} \right) + \left(\frac{10}{100} \times \frac{11}{20} \right) \right]$$

$$= 1,89,000 \left[\frac{2}{9} + \frac{7}{50} + \frac{8}{75} + \frac{11}{200} \right]$$

$$= 1,89,000 \times \frac{400 + 252 + 192 + 99}{1800}$$

$$= 1,89,000 \times \frac{943}{1800}$$

$$= 99,015$$

Total number of females who voted for NDA

$$= 3,00,000 \times \frac{63}{100} - 99,015$$

$$= 1,89,000 - 99,015$$

$$= 89,985$$

$$\text{Required difference} = 99,015 - 89,985 = 9,030$$

96. (c): Total voting population between age group (46 –

$$60) = 3,00,000 \times \frac{25}{100}$$

$$= 75000$$

$$\text{Required \%} = \frac{75000 - 3,00,000 \times \frac{63}{100} \times \frac{20}{100}}{75000} \times 100$$

$$= \frac{75000 - 37800}{75000} \times 100$$

$$= \frac{37200}{75000} \times 100$$

$$= 49.6\%$$

97. (b): Bats of brand 'B' and 'C' sold by Kamal

$$= \frac{18}{100} \times 66000 - 1080$$

$$= 11880 - 1080 = 10800$$

Let bats of Brand 'B' sold by Kamal = x

$$\Rightarrow \text{bats of brand 'C' sold by Kamal} = 1.25x$$

ATQ,

$$x + 1.25x = 10800$$

$$2.25x = 10800$$

$$\Rightarrow x = \frac{10800}{2.25} = 4800$$

$$\text{Required \%} = \frac{4800 - 1440}{1440} \times 100$$

$$= \frac{3360}{1440} \times 100 = 233 \frac{1}{3} \%$$

98. (b): Required difference

$$= \frac{27}{100} \times 66000 - 2400 - \frac{15}{100} \times 66000 + 1920$$

$$= \frac{12}{100} \times 66000 - 480$$

$$= 7920 - 480 = 7440$$

99. (d): Bats of brand 'B' sold by Rawat

$$= \frac{9}{10} \times \left[\frac{24}{100} \times 66000 - 1800 \right]$$

$$= \frac{9}{10} [15840 - 1800]$$

$$= 1404 \times 9 = 12636$$

$$\text{Required difference} = 12636 - \frac{16}{100} \times 66000$$

$$= 12636 - 10560$$

$$= 2076$$

100. (c): Total bats of brand 'A' sold by all five retailer

$$= 1080 + 1440 + 1800 + 2400 + 1920 = 8640$$

$$\text{Total amount got by all five retailers}$$

$$= 8640 \times \frac{4}{9} \times 400 + 8640 \times \frac{5}{9} \times 600$$

$$= 1536000 + 2880000$$

$$= 4416000 = 44.16 \text{ lakh}$$

101. (d): Bats of brand 'B' and 'C' sold by Rawat

$$= \frac{24}{100} \times 66000 - 1800 = 15840 - 1800$$

$$= 14040$$

Bats of band 'B' and 'C' sold by Kamal

$$= \frac{18}{100} \times 66000 - 1080 = 11880 - 1080$$

$$= 10800$$

$$\text{Required \%} = \frac{14040 - 10800}{10800} \times 100$$

$$= \frac{3240}{10800} \times 100$$

$$= 30\%$$

102. (c): Female who voted for party X in state MP

$$= 2400 \times \frac{70}{100} \times \frac{2}{5} \times \frac{7}{12} = 392 \text{ thousand}$$

Total population who voted for party Z in state MP

$$= 2400 \times \frac{30}{100} = 720 \text{ thousand}$$

$$\text{Required percentage} = \frac{392}{720} \times 100 = 54\frac{4}{9}\%$$

103. (a): Total population who voted for party Z in state UP

$$\text{and Bihar together} = 4800 \times \frac{36}{100} + 1250 \times \frac{24}{100}$$

$$= 1728 + 300 = 2028 \text{ thousand}$$

Total population who voted for party X in state UP

$$\text{and Bihar together} = 4800 \times \frac{64}{100} \times \frac{7}{12} + 1250 \times \frac{76}{100} \times \frac{3}{10}$$

$$= 1792 + 285 = 2077 \text{ thousand}$$

$$\text{Required difference} = 2077 - 2028 = 49 \text{ thousand}$$

104. (e): Required total = $750 \times \frac{60}{100} \times \frac{2}{5} + 1400 \times \frac{68}{100} \times \frac{3}{7} +$

$$1250 \times \frac{76}{100} \times \frac{7}{10}$$

$$= 180 + 408 + 665 = 1253 \text{ thousand}$$

105. (d): Total population of Kerala

$$= \frac{2400}{4} \times 13 = 7800 \text{ thousand}$$

Who voted for party X in state Kerala

$$= 4800 \times \frac{64}{100} \times \frac{7}{12} \times \frac{150}{100} = 2688 \text{ thousand}$$

Who voted for party Y in state Kerala = 2688 + 50?

$$= 2738 \text{ thousand}$$

Who voted for party Z in state Kerala

$$= 7800 - 2688 - 2738 = 2374 \text{ thousand}$$

$$\text{106. (e): Required ratio} = \frac{2400 \times \frac{70}{100} \times \frac{3}{5} + 750 \times \frac{60}{100} \times \frac{2}{5}}{4800 \times \frac{36}{100} + 1400 \times \frac{32}{100}} = \frac{297}{544}$$

107. (b): Total males who visited stadium on Sunday &

$$\text{Wednesday} = (110 - 52) + (130 - 46)$$

$$= 58 + 84 = 142$$

Total female who visited stadium on Monday &

$$\text{Tuesday} = 66 + 64 = 130$$

$$\text{Required ratio} = \frac{142}{130} = 71 : 65$$

108. (d): Average no. of females who visited stadium on

$$\text{Sunday & Tuesday} = \frac{52 + 64}{2} = 58$$

Average no. of males who visited stadium on

$$\text{Monday & Wednesday} = \frac{(150 - 66) + (130 - 46)}{2} = 84$$

$$\text{Required difference} = 84 - 58 = 26$$

109. (e): Total males who visited to stadium on Tuesday =

$$(140 - 64) = 76$$

Total males who visited to stadium on Monday =

$$(150 - 66) = 84$$

$$\text{Required \%} = \frac{84 - 76}{84} \times 100$$

$$= \frac{8}{84} \times 100 = 9.523 \approx 9.5\%$$

110. (b): Total people who visited to stadium on Friday =

$$150 \times \frac{120}{100} = 180$$

Total males who visited to stadium on Friday =

$$(150 - 66) \times \frac{125}{100} = 105$$

Total female who visited to stadium on Friday =

$$180 - 105 = 75$$

111. (c): Total no. of people who visited stadium on

$$\text{Sunday and Wednesday} = 110 + 130 = 240$$

Total no. of males who visited stadium on Monday

$$\text{\& Tuesday} = (150 - 66) + (140 - 64) = 160$$

$$\text{Required percentage} = \frac{240 - 160}{160} \times 100$$

$$= \frac{80}{160} \times 100 = 50\%$$

112. (b): Total resolved problems by P = $8000 \times \frac{80}{100} =$

$$6400$$

$$\text{total resolved problems by R} = 4800 \times \frac{90}{100} =$$

$$4320$$

$$\text{Required sum} = 6400 + 4320 = 10720$$

- 113.(b):** Total unresolved problems by S = $6600 \times \frac{30}{100} = 1980$
 Total unresolved problems by Q = $6400 \times \frac{15}{100} = 960$
 Required percentage = $\frac{1980 - 960}{960} \times 100 = 106.25\%$
- 114.(a):** Total resolved problems by Q = $6400 \times \frac{85}{100} = 5440$
 Total resolved problems by S = $6600 \times \frac{70}{100} = 4620$
 Required average = $\frac{5440 + 4620}{2} = 5030$
- 115.(e):** total resolved problems by P = $8000 \times \frac{80}{100} = 6400$
 total resolved problems by R = $4800 \times \frac{90}{100} = 4320$
 Required percent = $\frac{6400 - 4320}{6400} \times 100 = \frac{2080}{6400} \times 100 = 32.5\%$
- 116.(a):** Total unresolved problems by P = $8000 \times \frac{20}{100} = 1600$
 Total unresolved problems Q = $6400 \times \frac{15}{100} = 960$
 Total unresolved problems R = $4800 \times \frac{10}{100} = 480$
 Total unresolved problems S = $6600 \times \frac{30}{100} = 1980$
 Required sum = $1600 + 960 + 480 + 1980 = 5020$
- 117.(d):** Number of students studying at Banaras Hindu University = $80,000 \times \frac{15}{100} = 12,000$
 So, the number of boys studying at Banaras Hindu University = $\frac{4}{5} \times 12,000 = 9600$
- 118.(b):** Number of students studying at Allahabad University = $80,000 \times \frac{30}{100} = 24000$
 Number of students studying at Delhi University = $80,000 \times \frac{25}{100} = 20,000$
 So, the required ratio = $24000:20000 = 6:5$
- 119.(a):** Number of boys studying at Patna University = $80,000 \times \frac{20}{100} \times \frac{7}{10} = 11,200$
 Number of boys studying at Delhi University = $80,000 \times \frac{25}{100} \times \frac{3}{5} = 12,000$
 Number of boys studying at Allahabad University = $80,000 \times \frac{30}{100} \times \frac{8}{15} = 12,800$
 So, the required average = $\frac{11200 + 12000 + 12800}{3} = 12,000$

- 120.(b):** Number of boys at Lucknow University = $80000 \times \frac{10}{100} \times \frac{9}{10} = 7200$
 Number of girls at Lucknow University = $80000 \times \frac{10}{100} \times \frac{1}{10} = 800$
 So, the required difference = $7200 - 800 = 6400$
- 121.(b):** Let per unit price of Bike in 2017 be 'x'
 ATQ,
 $3400 \times 90 + x \times 100 = 450000$
 $x = 1440$ Rs.
- 122.(d):** Required Ratio = $\frac{1800 \times \frac{4}{3} \times 140}{1800 \times 100} = 28 : 15$
- 123.(a):** Price of Bike in 2018 = $2400 \times \frac{37.5}{100} = 900$
 So, required no. = $\frac{1800 \times 100}{900 \times 140} \times 100 = \frac{1000}{7} \%$
- 124.(b):** Revenue generated in 2020 by selling car = $60 \times 1.2 \times 2800 \times \frac{112.5}{100} = 22,68,00$ Rs.
 Revenue generated in 2019 by selling car = $60 \times 2800 = 168,000$
 So, per cent increase in revenue = $\frac{22,68,00 - 168,000}{168,000} \times 100 = 35\%$
- 125.(c):** Total revenue generated in 2020 by selling Bike = $2800 \times \frac{6}{7} \times 120 = 288,000$
 Per unit selling price of Bike = $\frac{288,000}{120} = \text{Rs. } 2400$
 So, per unit cost price of Bike = $\frac{2400}{1.25} = \text{Rs. } 1920$
- 126.(a):** Required average = $\frac{1}{3} \left[900 \times \frac{25}{100} + 700 \times \frac{15}{100} + 1650 \times \frac{30}{100} \right] = \frac{1}{3} [225 + 105 + 495] = 275$
- 127.(d):** Number of items which are not rejected by customer to company P = $900 \times \frac{75}{100} = 675$
 Items which were rejected by customer to company Q and R together = $1200 \times \frac{20}{100} + 700 \times \frac{15}{100} = 240 + 105 = 345$
 Required Percentage = $\frac{675 - 345}{345} \times 100 = 95\frac{15}{23} \%$ more
- 128.(c):** Required ratio = $\frac{800 \times \frac{60}{100}}{700 \times \frac{15}{100} + 1650 \times \frac{30}{100}} = \frac{480}{105 + 495} = \frac{480}{600} = 4 : 5$

$$129. (b): \text{Required Percentage} = \frac{1200 \times \frac{20}{100}}{800 \times \frac{40}{100}} \times 100 = 75\%$$

$$130. (e): \text{Required difference} = 1650 \times \frac{70}{100} - 700 \times \frac{85}{100} = 1155 - 595 = 560$$

$$131. (d): \text{Girls playing Hot Potato \& Chess together} = 800 \times \frac{10}{100} \times \frac{3}{5} + 800 \times \frac{30}{100} \times \frac{5}{12} = 48 + 100 = 148$$

$$\text{Boys playing Table Tennis} = 800 \times \frac{18}{100} \times \frac{25}{36} = 100$$

$$\text{So, required \%} = \frac{148 - 100}{100} \times 100 = 48\% \text{ more}$$

$$132. (e): \text{Average of girls playing Chess, Table Tennis and Card Games} =$$

$$\left[800 \times \frac{30}{100} \times \frac{5}{12} + 800 \times \frac{18}{100} \times \frac{11}{36} + 800 \times \frac{24}{100} \times \frac{1}{2} \right]$$

$$= \frac{100 + 44 + 96}{3} = 80$$

$$\text{Number of Boys playing Hot Potato and Card Games together} = 800 \times \frac{10}{100} \times \frac{2}{5} + 800 \times \frac{24}{100} \times \frac{1}{2} = 32 + 96 = 128$$

$$\text{Required ratio} = \frac{80}{128} = \frac{5}{8} = 5 : 8$$

$$133. (d): \text{Boys playing Chess and Table Tennis together} = 800 \times \frac{30}{100} \times \frac{7}{12} + 800 \times \frac{18}{100} \times \frac{25}{36} = 140 + 100 = 240$$

$$\text{Girls playing Hot Potato, Treasure Hunt and Card Games together}$$

$$= 800 \times \frac{10}{100} \times \frac{3}{5} + 800 \times \frac{12}{100} \times \frac{7}{12} + 800 \times \frac{24}{100} \times \frac{1}{2}$$

$$= 48 + 56 + 96$$

$$= 200$$

$$\text{Required \%} = \frac{240}{200} \times 100 = 120\%$$

$$134. (c): \text{Number of students who leaves Carrom} = 800 \times \frac{6}{100} \times \frac{75}{100} = 36$$

$$\text{Numbers of girls who leaves Carrom} = 800 \times \frac{12}{100} \times \frac{7}{12} \times \frac{25}{100} = 14$$

So,

$$\text{Number of girls who still plays Carrom} = 800 \times \frac{6}{100} \times \frac{3}{8} - 14 = 4$$

$$\text{Number of boys who still plays Carrom} = 800 \times \frac{6}{100} \times \frac{5}{8} - (36 - 14) = 30 - 22 = 8$$

$$\text{So, required ratio} = \frac{8}{4} = \frac{2}{1} = 2 : 1$$

$$135. (a): \text{Percentage distribution of boys playing Treasure Hunt} = 12 \times \frac{5}{12} = 5\%$$

$$\text{So, required angle} = \frac{360}{100} = \frac{x}{5}$$

$$= 18^\circ$$

$$136. (a): \text{Total 4 GB mobile sold by B} = 1890 \times \frac{125}{225} = 1050$$

$$\text{Total 4 GB mobile sold by D} = 2592 \times \frac{140}{240} = 1512$$

$$\text{Total 4 GB mobile sold by store B \& D} = (1050 + 1512) = 2562$$

$$\text{Total 6 GB mobile sold by A \& E} = 2820 \times \frac{100}{235} + 1960 \times \frac{100}{245}$$

$$= 1200 + 800 = 2000$$

$$\text{Required percentage} = \frac{2562 - 2000}{2000} \times 100$$

$$= \frac{562}{2000} \times 100$$

$$= 28.1\%$$

$$137. (d): \text{Total 6GB \& 4GB mobile of Samsung sold by store C}$$

$$= 2400 \times \frac{100}{250} \times \frac{7}{16} + 2400 \times \frac{150}{250} \times \frac{9}{24}$$

$$= 960 \times \frac{7}{16} + 1440 \times \frac{9}{24}$$

$$= 420 + 540$$

$$= 960$$

$$\text{Total 6GB mobile sold by store D} = 2592 \times \frac{100}{240} = 1080$$

$$\text{Required ratio} = \frac{960}{1080}$$

$$= 8 : 9$$

$$138. (a): \text{Total 6 GB mobile sold by A} = 2820 \times \frac{100}{235} = 1200$$

$$\text{Total 6 GB mobile sold by B} = 1890 \times \frac{100}{225} = 840$$

$$\text{Total 6 GB mobile sold by D} = 2592 \times \frac{100}{240} = 1080$$

$$\text{Required average} = \frac{1200 + 840 + 1080}{3}$$

$$= 1040$$

$$\text{Total 6GB mobile sold by store E} = 1960 \times \frac{100}{245} = 800$$

$$\text{Required percentage} = \frac{1040}{800} \times 100 = 130\%$$

$$139. (c): \text{Total 6GB mobile sold by store F} = 1890 \times \frac{125}{225} \times \frac{120}{100} = 1260$$

$$\text{Total 4GB mobile sold by store F} = 1260 \times \frac{55}{45} = 1540$$

$$\text{Total 4GB mobile sold by store E} = 1960 \times \frac{145}{245} = 1160$$

$$\text{Required difference} = 1540 - 1160 = 380$$

$$140. (d): \text{Total sold mobile by store A} = 2820 \times \frac{100}{235} + 2820 \times \frac{135}{235} \times \frac{80}{100} = 2496$$

$$\text{Total sold mobile by store C} = 2400 \times \frac{100}{250} + 2400 \times \frac{150}{250} \times \frac{75}{100} = 2040$$

$$\text{Total sold mobile by store D} = 2592 \times \frac{100}{240} + 2592 \times \frac{140}{240} \times \frac{87.5}{100} = 2403$$

$$\text{Required sum} = 2496 + 2040 + 2403 = 6939$$

$$141. (b): \text{Total girls appeared from AP} = 48000 \times \frac{70}{100} \times \frac{80}{100} \times \frac{11}{24} = 12320$$

$$\text{Total girls appeared from UP} = 54000 \times \frac{70}{100} \times \frac{90}{100} \times \frac{4}{9} = 15120$$

$$\text{Required difference} = 15120 - 12320 = 2800$$

$$142. (d): \text{Total girls appeared from Bihar} = 36000 \times \frac{68}{100} \times \frac{75}{100} \times \frac{1}{3} = 6120$$

$$\text{Total girls from Bihar} = 36000 \times \frac{32}{100} = 11520$$

$$\text{Required percentage} = \frac{6120}{11520} \times 100 = 53.125\%$$

$$143. (e): \text{Total girls appeared in exam from MP} = 42000 \times \frac{60}{100} \times \frac{80}{100} \times \frac{9}{16} = 11340$$

$$\text{Total boys appeared in exam from AP} = 48000 \times \frac{70}{100} \times \frac{80}{100} = 26880$$

$$\text{Required ratio} = \frac{11340}{26880}$$

$$= 27 : 64$$

$$144. (e): \text{Total girls appeared in the exam from Rajasthan} = 50000 \times \frac{56}{100} \times \frac{96}{100} \times \frac{3}{4} = 20160$$

$$\text{Total boys from Rajasthan} = 50000 \times \frac{56}{100} = 28000$$

$$\text{Required percentage} = \frac{28000 - 20160}{28000} \times 100$$

$$= \frac{7840}{28000} \times 100$$

$$= 28\%$$

$$145. (a): \text{Total boys appeared in exam from Bihar} = 36000 \times \frac{68}{100} \times \frac{75}{100} = 18360$$

$$\text{Total boys appeared in exam from MP} = 42000 \times \frac{60}{100} \times \frac{80}{100} = 20160$$

$$\text{Required average} = \frac{18360 + 20160}{2}$$

$$= \frac{38520}{2} = 19260$$

Sol. (146 - 150):-

Year	Units Sold	
	A	B
2014	1080	1900
2015	800	3400
2016	1275	3600
2017	1800	2000
2018	1900	3150

$$146. (b): \text{Units of laptop sold by company - A in 2014 and 2015 together} = 1080 + 800 = 1880$$

$$\text{Required \%} = \frac{1880}{2000 + 3000} \times 100 = 37.6\%$$

$$147. (e): \text{Average of units of laptop sold by company - A in 2015 and 2018} = \frac{800 + 1900}{2} = 1350$$

$$\text{Units of laptop sold by company - B in 2015 and 2017 together} = 3400 + 2000 = 5400$$

$$\text{Required \%} = \frac{5400 - 1350}{5400} \times 100 = \frac{4050}{54} \% = 75\%$$

$$148. (a): \text{Units of laptop manufactured by company - B in 2017 and 2018 together} = 2100 + 3000 = 5100$$

$$\text{Units of laptop sold by company - A in 2016 and 2017 together} = 1275 + 1800 = 3075$$

$$\text{Required ratio} = \frac{5100}{3075} = \frac{68}{41} = 68 : 41$$

$$149. (c): \text{Required average} = \frac{1900 + 3600 + 3150}{3} = 2883.33$$

$$= 2900 \text{ (approx.)}$$

$$150. (d): \text{Unsold units of laptop of company - A in 2018} = [1200 + 880 + 1300 + 2025 + 1550] - [1080 + 800 + 1275 + 1800 + 1900]$$

$$= 6955 - 6855 = 100$$

$$\text{Unsold units of laptop of company - B in 2018}$$

$$= [2000 + 3900 + 3400 + 2100 + 3000] - [1900 + 3400 + 3600 + 2000 + 3150]$$

$$= 14400 - 14050 = 350$$

$$\text{Required difference} = 350 - 100 = 250$$

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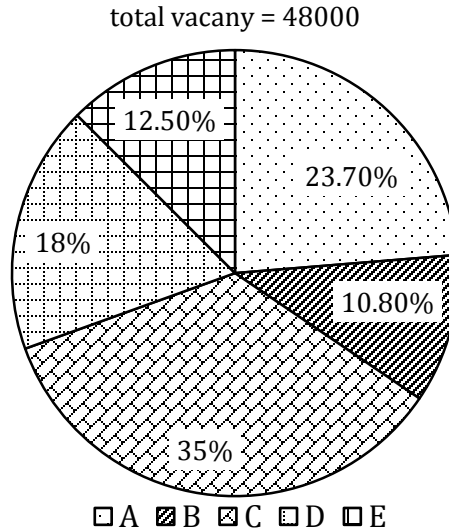
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Practice MCQs for Mains

Directions (1-5): Pie chart given below shows percentage distribution of vacancy issued for the post of clerk by RRB in five different area and table shows distribution of no. of vacancy for three different categories i.e. (General, OBC, and SC/ST). Some data is missing in the table you have to calculate the data according to given information and answer the following questions.

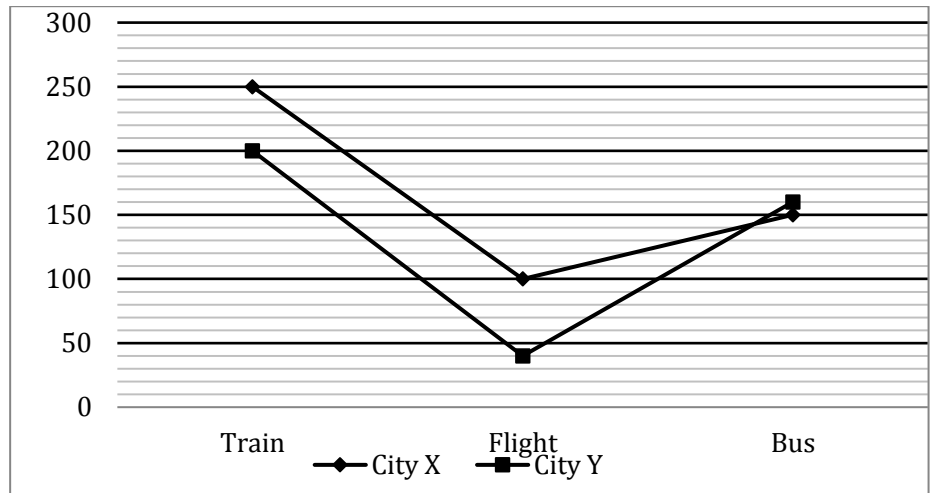
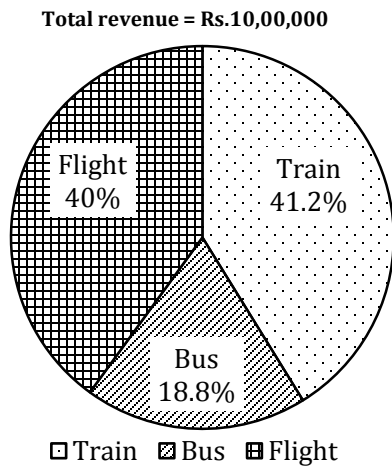


Area	General	OBC	SC/ST
A	5000	4480	-
B	2000	-	1888
C	-	-	-
D	5544	-	-
E	-	2000	1000

- Vacancy for SC/ST category in area A is how much more or less than no. of vacancy for OBC category in area B?
(a) 600 more (b) 500 less (c) 400 less (d) 600 less (e) 400 more
- If in area C vacancy for General and SC/ST category is 320% more and 1612 more than vacancy of same category in area B respectively, find ratio of vacancy for General, OBC and SC/ST category in area C?
(a) 11:9:4 (b) 12:7:5 (c) 12:5:1 (d) 6:5:1 (e) None of these.
- No. of vacancy for OBC category in area C is approximately how much percent more or less than no. of vacancy for General in area E? (use information of question no. 42)
(a) 63% less (b) 60% less (c) 63% more (d) 67% more (e) 68% less
- What is the ratio of total vacancy in area A and E together to total vacancy in area D?
(a) 2:1 (b) 181:90 (c) 161:90 (d) 4:5 (e) 121:70
- If in area D, difference between vacancy for OBC and SC/ST (OBC > SC/ST) is 936, then find vacancy for SC/ST in area D is how much more than vacancy for same category in area E?
(a) 100 (b) 108 (c) 64 (d) 80 (e) 120

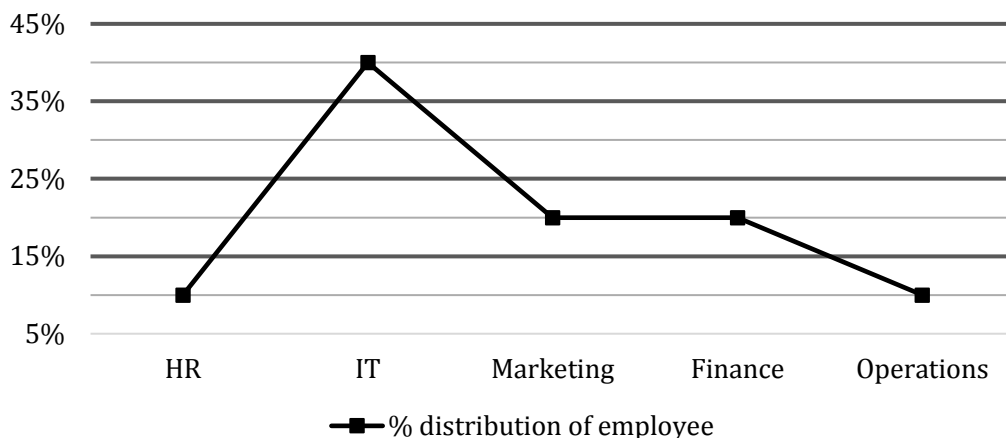
Directions (6-11): Study the charts given below and answer the following questions.

Pie chart shows the percentage distribution of total revenue from sales of tickets of three different transport facilities (train, bus & flight) in two different cities (X & Y) together and line chart shows the number of tickets sold of these 3 transports in these 2 cities.

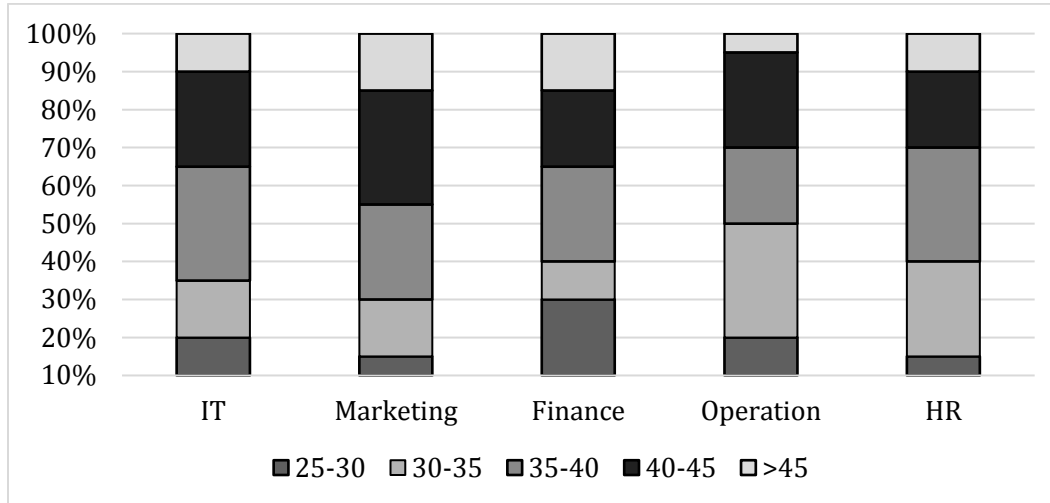


6. If price of each ticket of Flight in city X is 60% of each ticket of flight in city Y, then revenue of city Y from flights tickets is how much more than the revenue of city X from flights tickets.
 (a) Rs.100000 (b) Rs.120000 (c) Rs.180000 (d) Rs.60000 (e) Rs. 80000
7. If price of each ticket of train in city Y is Rs.260 more than price of each ticket of train in city X, then find total revenue of city Y from train tickets is what percent more or less than total revenue of city X from train tickets?
 (a) 4% (b) 9% (c) 6% (d) 14% (e) 15%
8. If ratio of economy tickets to business class tickets of flight sold in city X and city Y is 3 : 1 and 5 : 3 respectively, then find average of economy tickets of flight sold in these two cities is how much more or less than average of bus tickets sold in these two cities?
 (a) 85 (b) 100 (c) 140 (d) 105 (e) 150
9. If revenue of city Y from bus tickets is $113\frac{1}{3}\%$ more than revenue of city X from bus tickets, then find the difference in per bus ticket price in city X and city Y.
 (a) Rs.300 (b) Rs.250 (c) Rs.400 (d) Rs.450 (e) Rs.350
10. Find ratio of bus tickets and train tickets together sold in city X to bus tickets and flight tickets together sold in city Y.
 (a) 5 : 2 (b) 2 : 1 (c) 1 : 2 (d) 2 : 5 (e) None of the above.
11. If ratio of per ticket price of flight in city X to that of in city Y is 4 : 15 and in next year per ticket price of flight in city X and city Y increased by 40% and reduced by 50% respectively, then find total revenue of city X & city Y together from flights in next year. (in lacs)
 (a) Rs.3.62 (b) Rs.3.44 (c) Rs.3.28 (d) Rs.3.54 (e) Rs.3.76

Directions (12-16): Read the given information carefully and answer the following questions. Line graph shows the percentage distribution of the employees in different departments in a firm.



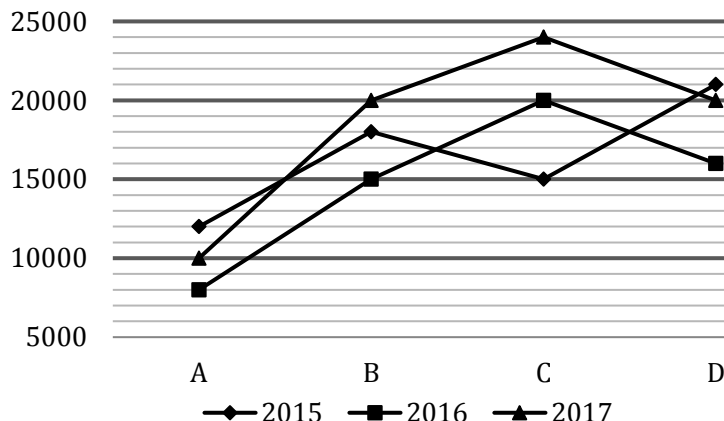
Bar graph shows the percentage of employees of different age groups in these 5 departments in the same firm.



12. The number of employees of age group 35 – 40 in the finance department is what percent more or less than the number of employees of age group 25 – 30 in the operations department?
 (a) 175% (b) 180% (c) 120% (d) 150% (e) 125%
13. The total number of employees in the firm of age group more than 45 years from all the departments together form what percent of the total employees in the firm?
 (a) 17.5% (b) 18% (c) 11.5% (d) 15% (e) 12.5%
14. The total number of employees in the IT department of age group 25 – 30 is 60. Find the total number of employees in the marketing department who belong to the age group of 40 – 45?
 (a) 35 (b) 45 (c) 40 (d) 30 (e) 50
15. If all the employees of age group more than 45 years from Finance department retire from their post and the same number of new employees join the same department but belong to the age group of 30 – 35 years, then find the number of employees in Finance department of age group 30 – 35 years, if the number of employees who retired is 150.
 (a) 250 (b) 265 (c) 275 (d) 300 (e) 280
16. Find the average of employees in finance and HR, if the difference in the number of employees in IT department of age group more than 45 and the number of employees in the operations department of age group 40 – 45 is 45?
 (a) 510 (b) 450 (c) 480 (d) 440 (e) 420

Directions (17-21): Study the line chart and table carefully and answer the following questions.

Line chart shows the number of pens manufactured by 4 different companies (A, B, C & D) in 2015, 2016 & 2017 and table shows the percentage of defective pens of these 4 companies in 2015, 2016 & 2017.



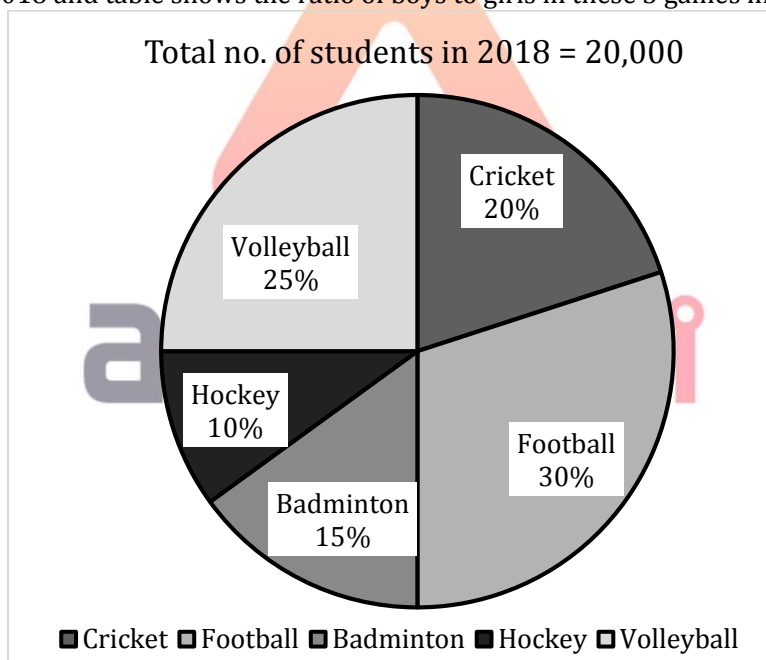
Companies	Years		
	2015	2016	2017
A	20%	25%	10%
B	25%	20%	15%
C	30%	15%	25%
D	20%	25%	30%

Note – Total pens manufactured by any company in any year = Total (defective + non-defective) pens of that company in that year.

17. Non – defective pens of A & D together in 2015 is what percent of defective pens of A, B & C together in 2017?
 (a) 242% (b) 264% (c) 276% (d) 258% (e) 250%
18. Difference of average of defective pens of A, C & D in 2016 and average of non-defective pens of A & B in 2015 is how much more/less than non-defective pens of A & D in 2017 together?
 (a) 12380 (b) 13420 (c) 13970 (d) 14850 (e) 14450
19. Cost price of manufacturing a pen for C in 2017 is Rs.1.5. C sold the non – defective pens at 40% profit and defective pens at loss. If C sold all pens manufactured by it in 2017 and total profit of C in 2017 is Rs.4800, then find loss percentage at which C sold its defective pens in 2017?
 (a) $66\frac{2}{3}\%$ (b) 50% (c) $73\frac{2}{3}\%$ (d) $33\frac{1}{3}\%$ (e) $42\frac{6}{7}\%$
20. Non-defective pens of A in 2015, 2016 & 2017 together is what percent more or less than non-defective pens of B in 2015, 2016 & 2017 together?
 (a) $79\frac{13}{17}\%$ (b) $56\frac{5}{17}\%$ (c) $42\frac{2}{17}\%$ (d) $65\frac{5}{17}\%$ (e) $38\frac{11}{17}\%$
21. Non-defective pens of A in 2016 & 2017 together is how much more/less than defective pens of C & D together in 2017?
 (a) 7000 (b) 4500 (c) 3000 (d) 5000 (e) 6500

Directions (22-26): Study the pie chart and table carefully and answer the following questions.

Pie chart shows percentage distribution of total number of students in 5 different games (Cricket, Football, Badminton, Hockey and Volleyball) in 2018 and table shows the ratio of boys to girls in these 5 games in 2018 and in 2019.



Games	2018	2019
	Boys : Girls	Boys : Girls
Cricket	3 : 7	5 : 7
Football	7 : 3	2 : 1
Badminton	1 : 4	2 : 5
Hockey	3 : 2	x : 89
Volleyball	2 : 3	7 : 3

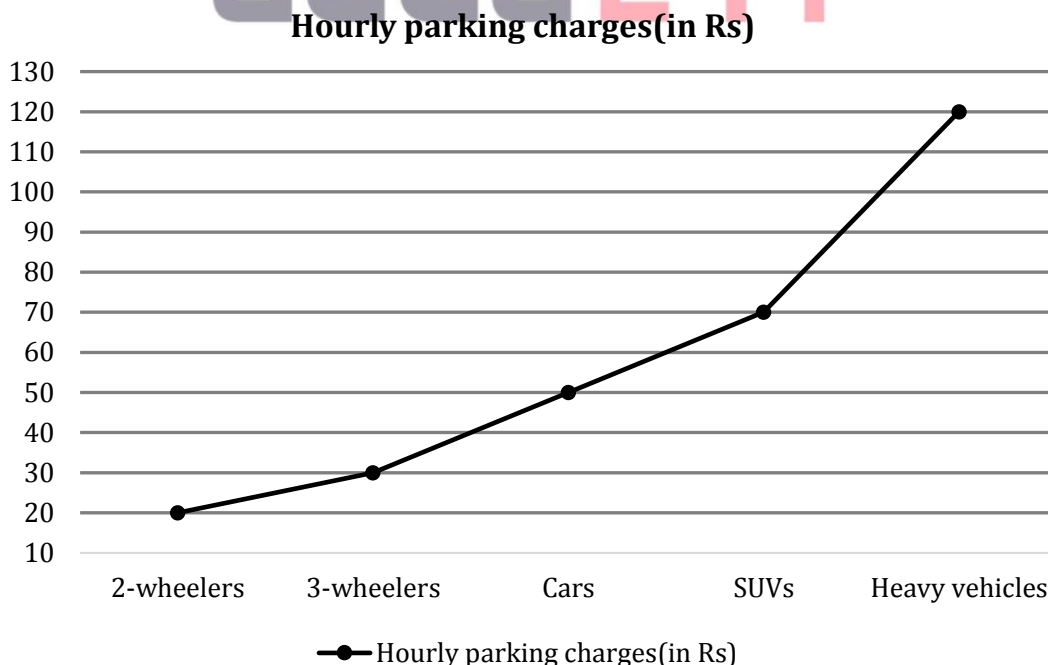
22. Total number of boys in Cricket, Football & Hockey together in 2018 is what percent of total number of students in 2018?
 (a) 33% (b) 35% (c) 23% (d) 32% (e) None of these
23. What is the ratio of total number of girls in cricket, football and badminton together in 2018 to the boys in Volleyball and Badminton together in 2018?
 (a) 54 : 11 (b) 13 : 52 (c) 13 : 54 (d) 35 : 13 (e) None of these
24. If number of boys in Football in 2019 is increased by 50% as compared to previous year and number of boys in Cricket in 2019 is increased by 20% as compared to previous year, then what is the total number of girls in Football in 2019 and number of girls in Cricket in 2019 together?
 (a) 5166 (b) 5058 (c) 5194 (d) 5108 (e) None of these
25. If total student in 2019 in Hockey is 5000 and no. of boys in Hockey is increased by 20% from 2018 to 2019, then find value of x?
 (a) 36 (b) 45 (c) 38 (d) 49 (e) None of these
26. If total students in Hockey in 2019 are 4000 and no. of girls in Hockey is increased by $233\frac{3}{4}\%$ from 2018 to 2019, then find number of boys in Hockey in 2019.
 (a) 1580 (b) 1330 (c) 1470 (d) 1390 (e) None of these

Direction (27-30): Read the given information carefully and answer the following questions.

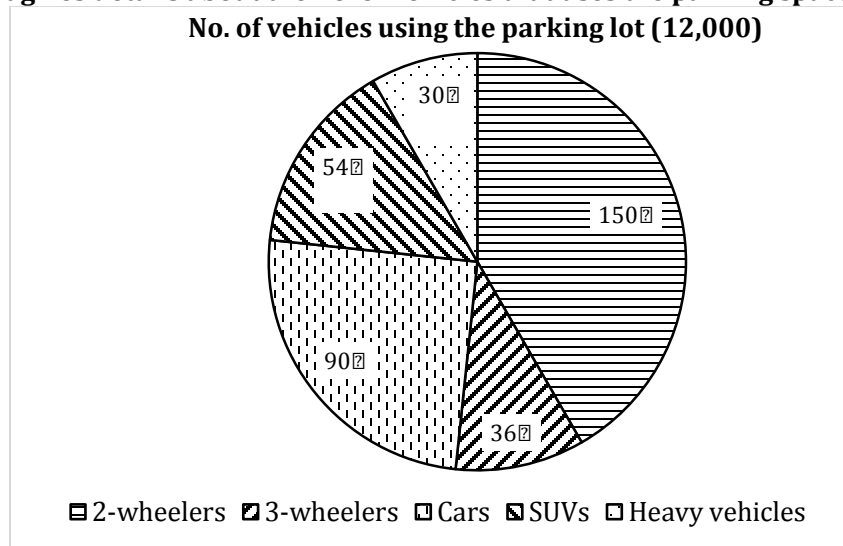
Unitech Cyber Park has a multi-level-parking lot. The parking charge depends on the vehicle type (one among 2-wheelers, 3-wheelers, Cars, SUVs and Heavy vehicles) and the number of hours for which a vehicle is parked.

Note:- In case, the time for which a vehicle uses the parking space is not in integral hours, the usage time is rounded off to the nearest higher hour.

Given below is the line graph which shows the hourly parking charges for different types of vehicles.



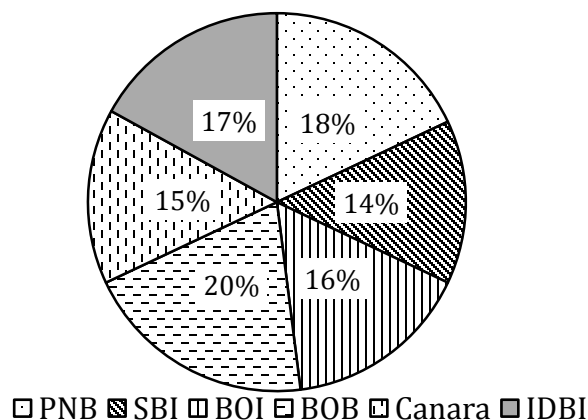
The following pie-chart gives details about the no. of vehicles that uses the parking space on a particular day.



27. If on the given day all the 2-wheelers, 3-wheelers and cars used the parking lot for $1\frac{1}{2}$ hours, 2 hours, $2\frac{1}{4}$ hours respectively then find the total parking charges received by these given vehicles?
 (a) Rs 12,78,000 (b) Rs 13,24,000 (c) Rs 12,48,000 (d) Rs 7,22,000 (e) Rs 14,08,000
28. On that day two-fifths of the 2-wheelers used the parking lot for two-and-a-half hours and the remaining two wheelers used the parking lot for more than three hours but less than four hours. None of the cars used the parking lot for more than two hours while one-third of them used the parking lot for less than or equal to one hour. Find the difference between the average parking charge per bike and the average parking charge per car.
 (a) Rs 10 (b) Rs 11.33 (c) Rs 12.50 (d) Rs 15 (e) Rs 13.5
29. On next day, the number of 2-wheelers and cars using parking lot is decreased by 25% and 33.33% respectively and the number of 3-wheelers and SUV using the parking lot is increased by 20% and 50% respectively while no of heavy vehicles using parking lot is same. Number of 2-wheelers that used the parking lot on next day is what percent of the total number of vehicles that used the parking lot on next day. (approx)
 (a) 35% (b) 30% (c) 40% (d) 28% (e) 45%
30. On the given day, all the 2-wheelers, cars and heavy vehicles used the parking lot for one and-a-half hours, two hours and fifteen minutes and three-and-a-half hours respectively. Find the ratio of parking charge received from Heavy vehicles to the total parking charge received from Cars and 2-wheelers together?
 (a) 5: 6 (b) 3: 4 (c) 24: 35 (d) 15: 19 (e) 48:65

Direction (31 - 35): Given below pie chart shows percent breakup of number of employees working in six different government sector banks in the years 2017. Table shows percentage of male employees more or less than female employees in these banks in the years 2017 and new joining percentage & retired employees' percentage in the years 2018 calculated over total employee at the end of the year 2017

Total employees = 105000



Banks	Percentage of male employees more or less than female employees in 2017	New joining percentage in 2018	Retired employees' percentage in 2018
PNB	- 20%	12%	8%
SBI	+ 50%	16%	10%
BOI	-40%	15%	8%
BOB	$- 33\frac{1}{3}\%$	12%	18%
Canara	+ 50%	20%	12%
IDBI	$+ 33\frac{1}{3}\%$	8%	16%

Note - + % shows male employee more than female employee and - % shows male employee less than female employee. Total employee working during a year calculated at the end of years.

Example -

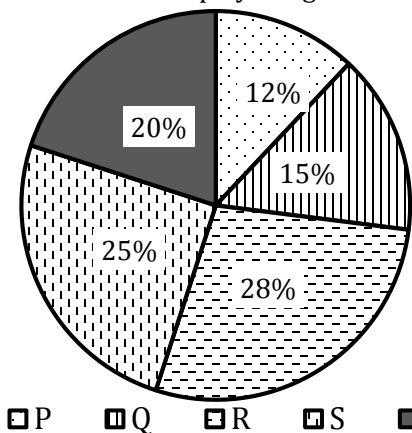
Total employee working in 2018 = Total employee working in 2017 + New joining - Retired employees'

31. If ratio of male employee to female employee in SBI in the year 2018 is 4 : 3, then find approximate percentage increase in number of female employee working in 2018 over the 2017 in SBI?
 (a) 13.5% (b) 8.5% (c) 18.5% (d) 20% (e) 22.5%
32. If total female employee working in BOB in 2018 is 12.5% less than that of male employee working in BOB in that year, then find difference between female employee working in BOB in 2017 & 2018?
 (a) 3368 (b) 3388 (c) 3356 (d) 3316 (e) 3348
33. If total male employee in Canara in the year 2018 is 9010 and 2150 female employee joined the Canara in 2018, then find number of male employees who retired?
 (a) 1400 (b) 1040 (c) 1740 (d) 1240 (e) 1440
34. Find difference between total employee working in BOI to total employee working in IDBI in the year 2018?
 (a) 1544 (b) 1654 (c) 1254 (d) 1354 (e) 1554
35. If ratio of male employee to female employee in PNB in 2018 is same as in the year 2017, then difference between number of female employees working in PNB in given two years is what percent of female employee working in BOB in the year 2017?
 (a) $6\frac{1}{3}\%$ (b) 5% (c) $2\frac{1}{3}\%$ (d) 3 (e) $3\frac{1}{3}\%$

Direction (36 – 40): Given pie chart shows percentage distribution of students who play 'Pubg' from five different colleges (P, Q, R, S & T) and table shows number of students who have Royal elite pass. Read the data carefully and answer the questions.

Note- Student who play Pubg = Student who have royal elite pass + Student who do not have royal elite pass

Total students play Pubg = 6000

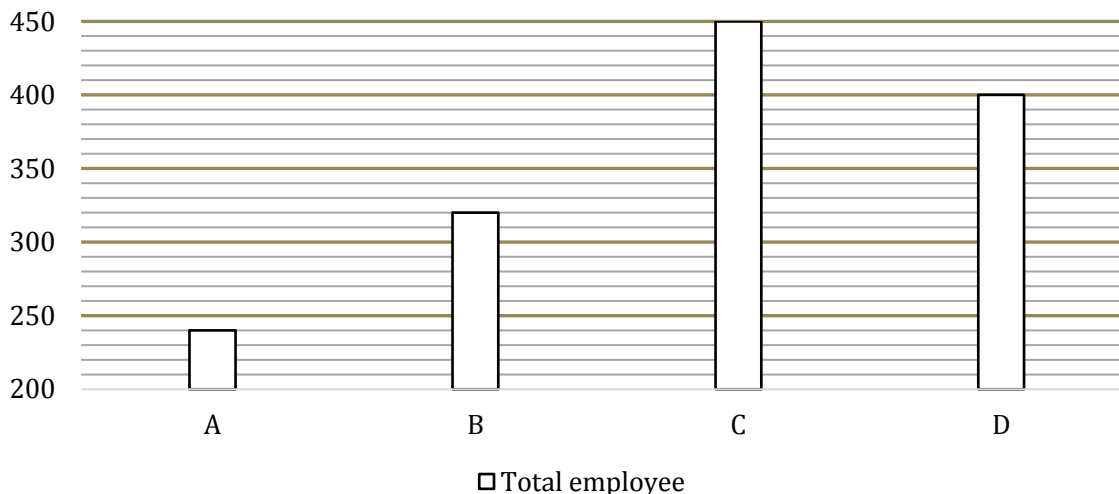


Colleges	Students who have Royal elite pass
P	440
Q	500
R	880
S	700
T	360

36. Total students who do not have Royal elite pass from Q & T together is what percent more than total students who do not have Royal elite pass from R?
 (a) 45% (b) 40% (c) 35% (d) 55% (e) 60%
37. If total boys who do not have Royal elite pass is $66\frac{2}{3}\%$ more than total girls who do not have Royal elite pass from S, then find ratio of total boys who do not have Royal elite pass from S to total students who do not have Royal elite pass P & R together?
 (a) 25 : 64 (b) 25 : 54 (c) 25 : 58 (d) 25 : 52 (e) None of these
38. Find the central angle for total students who do not have Royal elite pass from Q & R and total students who have Royal elite pass from T with respect of total students who played 'Pubg'?
 (a) 93.6° (b) 83.6° (c) 99.6° (d) 84.6° (e) 88.6°
39. Out to total students who played 'Pubg' from R, $46\frac{3}{7}\%$ are girls and $\frac{7}{13}$ th of total girls who play 'Pubg' have Royal elite pass, then find total boys who do not have Royal elite pass?
 (a) 320 (b) 356 (c) 396 (d) 360 (e) 440
40. In another college 'U' total students who have Royal elite pass are 20% more than total students who have not Royal elite pass from P and students who have Royal elite pass are $42\frac{6}{7}\%$ of total students who play 'Pubg' from U. Find total students who do not have Royal elite pass from U is what percent less than total students who do not have Royal elite pass from R?
 (a) 32% (b) 36% (c) 44% (d) 30% (e) 38%

Direction (41 – 45) : Bar graph given below shows number of employees working in four different companies and table shows percentage of employee prefer three modes of vehicle for going office & some data given in paragraph. Read the data carefully and answer the questions.

Note – An employee using one out of three modes of vehicle or no modes of vehicle out of three.



Companies	Cab	Metro	Auto
A	40%	-----	35%
B	25%	15%	-----
C	-----	12%	40%
D	-----	-----	45%

In company A, total employee prefer Metro are 50% more than total employee who do not prefer any mode of vehicle.

In company B, total employee prefer Auto are $66\frac{2}{3}\%$ more than total employee who do not prefer any mode of vehicle.

In company C, total employee prefer Cab are 20 more than total employee prefer Auto.

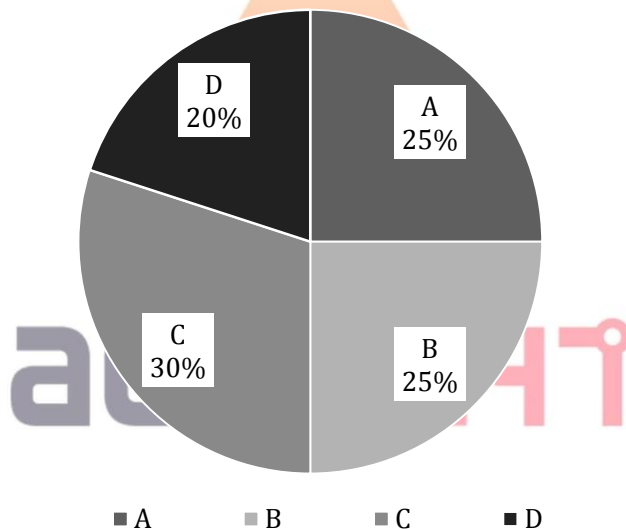
In company D, number of employees prefer Cab are 50% more than number of employees prefer Metro and number of employees who do not prefer any mode of vehicle are 2 less than do not prefer any mode of vehicle from company B.

41. Find the percentage of employee who do not prefer any mode of vehicle from all the four companies (approximate)?
 (a) 16% (b) 13% (c) 18% (d) 15% (e) 20%
42. Find the ratio of employee prefer Metro from A to total employee prefer Auto from B?
 (a) 3 : 8 (b) 3 : 7 (c) 3 : 11 (d) 3 : 10 (e) None of these
43. Total employee who do not prefer any mode of vehicle from B is what percent less than employee who prefer cab from C?
 (a) 44% (b) 56% (c) 60% (d) 66% (e) 64%
44. Find difference between total employee prefer cab & metro together & total employee do not prefer any mode of vehicle from D?
 (a) 60 (b) 100 (c) 80 (d) 120 (e) 160
45. Total employee prefer cab from C is what percent of total employee prefer cab & metro together from D?
 (a) $133\frac{1}{3}\%$ (b) $113\frac{1}{3}\%$ (c) $137\frac{1}{3}\%$ (d) $140\frac{1}{3}\%$ (e) $136\frac{1}{3}\%$

Directions (46-50): Study the pie chart and table given below and answer the following questions.

Pie chart shows the percentage distribution of total employees of a company – X in 4 different departments (A, B, C & D) and table shows the number of male employees in these departments.

Total employees = 2000



Departments	Male employees
A	240
B	225
C	350
D	160

46. If 38% of the female employees in C are newly recruited and ratio of male employees to female employees who are newly recruited in C is 3 : 5, then find total number of old employees in C is what percent of total employees in C?
 (a) $83\frac{1}{3}\%$ (b) $74\frac{2}{3}\%$ (c) $65\frac{2}{3}\%$ (d) $70\frac{2}{3}\%$ (e) $78\frac{1}{3}\%$
47. If ratio of male employees to female employees in company – Y is 4 : 3 and male employees in company – Y are 300% more than male employees in C of company – X, then find total employees in company – Y are how much more or less than that of in company – X?
 (a) 450 (b) 800 (c) 560 (d) 630 (e) 750

48. If 16% female employees of B left B and joined D, then find the percentage change in no. of female employees in D after female employees of B joined D.
 (a) $25\frac{2}{3}\%$ (b) $34\frac{2}{3}\%$ (c) $18\frac{1}{3}\%$ (d) $30\frac{2}{3}\%$ (e) $35\frac{1}{3}\%$
49. If male employees in company – K are 425 more than female employees in B in company – X, then find average number of female employees in A, C & D in company - X are how much less than male employees in company – K?
 (a) 400 (b) 450 (c) 360 (d) 480 (e) 520
50. If ratio of employees who are in (18-40) age group to employees who are in (40+) age group in A, B, C & D in company – X is 13 : 12, 13 : 37, 4 : 1 & 33 : 7 respectively, then find ratio of total no. of employees of (18 – 40) age group to total no. of employees of (40+) age group employees in company – X.
 (a) 2 : 1 (b) 9 : 5 (c) 5 : 4 (d) 3 : 2 (e) None of the above.

Directions (51-54): Read the following pie-chart and table carefully and answer the following questions Pie-chart shows the number of pens produced by six different companies in 2016.

Total number of pens produced = 3 lakhs

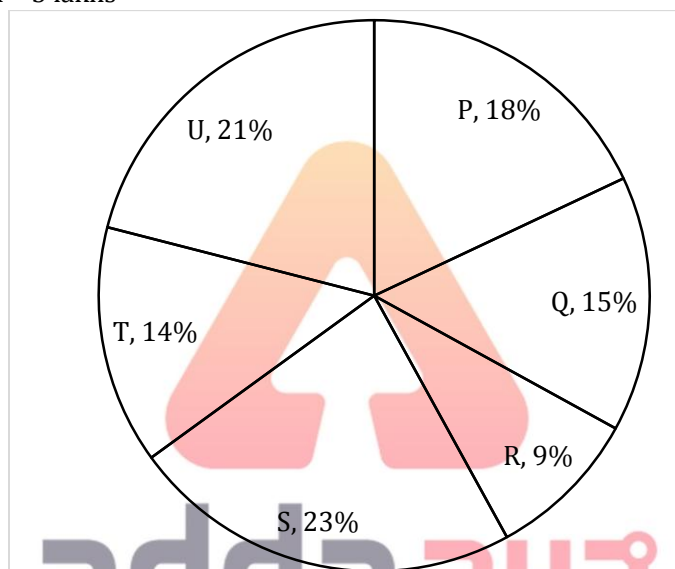
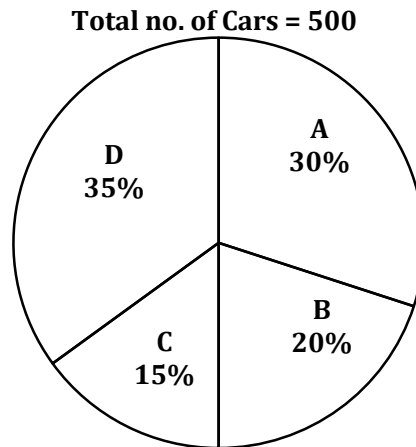


Table shows percentage of pens sold by each company in 2016 out of total pens produced by each company in 2016.

Company	% sale
P	82%
Q	70%
R	74%
S	64%
T	80%
U	74%

51. Total number of pens produced by company Q is approximately what percent more or less than total number of pens sold by R and S together.
 (a) 25% (b) 28% (c) 30% (d) 32% (e) 35%
52. What is the difference between number of pens sold by company U and S?
 (a) 2460 (b) 2530 (c) 2550 (d) 2580 (e) 2340
53. Find the average number of unsold pens of company P, Q and U.
 (a) 12400 (b) 12800 (c) 13200 (d) 13400 (e) 13750
54. Total number of pens sold by company P, R and T together are approximately what percent of their total production?
 (a) 74% (b) 84% (c) 76% (d) 80% (e) 87%

Directions (55-59) : The following pie chart shows the percentage distribution of total number of cars parked on a particular day in 4 different parking lots (A, B, C & D) of an official complex and the table shows the ratio of types of cars parked.



Parking Lot	Ratio of types of cars (Hatchback : Sedan : SUV)
A	8 : 5 : 2
B	4 : 3 : 3
C	9 : 4 : 2
D	3 : 2 : 2

55. How many hatchback cars are there in parking lots A and B together?
 (a) 120 (b) 80 (c) 130 (d) 100 (e) 110
56. What is the ratio of sedan cars in parking lot C to SUV cars in parking lot D?
 (a) 2 : 1 (b) 3 : 7 (c) 1 : 5 (d) 2 : 5 (e) 15 : 7
57. What is the average number of sedan cars in all the parking lots together?
 (a) 35 (b) 36.5 (c) 37.5 (d) 39 (e) 40
58. If 10% of total cars parked in parking lot A are shifted to parking lot B. Find SUV cars in parking lot B now. (ratio of hatchback : sedan : SUV in the shifted cars from parking lot A to parking lot B is 8 : 5 : 2)
 (a) 35 (b) 38 (c) 45 (d) 42 (e) 32
59. Sedan cars in parking lot C are what percent less than hatchback cars in parking lot D?
 (a) $26\frac{2}{3}\%$ (b) $73\frac{1}{3}\%$ (c) 40% (d) $66\frac{2}{3}\%$ (e) 75%

Directions (60-64): Study the pie chart and table carefully and answer the following questions.
 Given pie chart shows the percentage of users of different policy products provided by LIC.

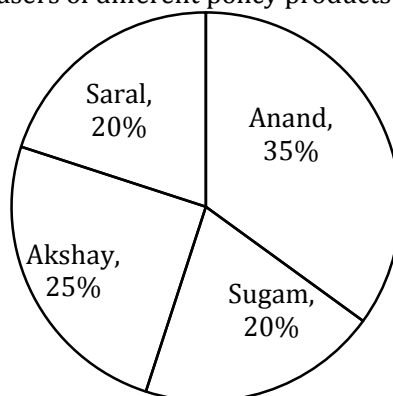


Table shows the distribution (some values are fixed while some are given as percentage) of users based on life of policies (Life of policy is to be counted from the start of the policy term to till date). Some data is missing; you have to find that on the basis of information provided with the questions.

Life (years)	0 - 1	1 - 3	3 - 5	More than 5 years
Anand	10%	105	175	-
Sugam	-	-	30	5%
Akshay	10%	50	50%	20%
Saral	80	60	-	15%

60. Find the no. of users of Anand whose policy life is more than 5 years.
 (a) 50 (b) 210 (c) 35
 (d) Cannot be determined (e) None of these
61. What is the total no. of users of Anand, Sugam and Saral who started within a year? If no. of users of Sugam having policy life 0-1 yr is twice the no. of users of Akshay having policy life 1-3 yr.
 (a) 215 (b) 165 (c) 220
 (d) Cannot be determined (e) None of these
62. Users of Anand having policy life 3-5 yr is what percent more than the users of Saral having policy life 1-5 yr? (approx)
 (a) 90% (b) 93% (c) None of these
 (d) 95% (e) Cannot be determined
63. What is the total number of users having policy for (0-1 years)?
 (a) 90 (b) 115 (c) 125
 (d) Cannot be determined (e) None of these
64. What is the ratio of no. of users of Anand having policy life of more than 5 years and Sugam having policy life 1-3 years together to the no. of users of Saral having policy life of more than 3 years? (if Sugam users having policy life 1-3 yr is same as Saral users having life 3-5 yrs)
 (a) 7 : 6 (b) 1 : 2 (c) None of these
 (d) Cannot be determined (e) 13 : 12

Directions (65-69): Given pie chart below shows the data of trainees registered in various courses under Skill India programme. Study the data carefully and answer the questions.

Total Trainees = 1000

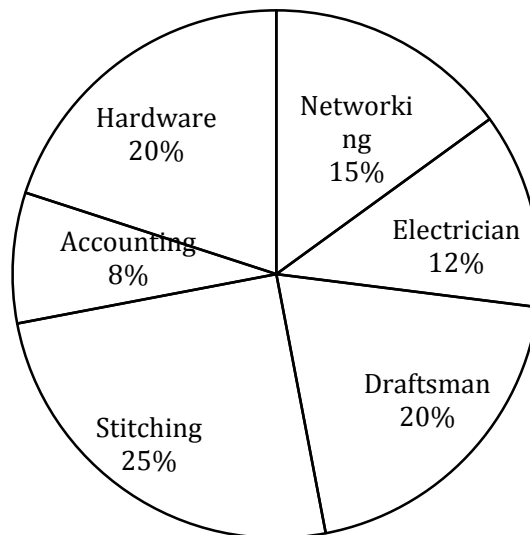


Table shows the percentage of females in these courses

Networking	50
Electrician	30
Draftsman	35
Stitching	70
Accounting	55
Hardware	45

Note – Total trainees in a course = Total (male + female) trainees in that course.

65. What is the ratio of males in Draftsman course to that of in Hardware course?
 (a) 13:11 (b) 1:1 (c) 7:9 (d) 7:11 (e) 13:9
66. Females in Stitching and Accounting together are what percent more/less than males in Networking & Electrician courses together?
 (a) 40.2% (b) 35.52% (c) 30% (d) 27.4% (e) 37.74%
67. How many males have registered in all these 6 courses?
 (a) 470 (b) 490 (c) 510 (d) 530 (e) 550
68. In the next year, there is a hike of 10% and 20% in no of trainees of Networking & Stitching course respectively with respect to present year while in both of these courses, no. of females increased by 20% in each course. Find the average of males in both these courses in next year.
 (a) 75 (b) 82.5 (c) 85 (d) 90 (e) 92.5
69. Determine the difference between average of total males in Hardware, Accounting and Draftsman course and the total females in all the courses except Stitching course.
 (a) 244 (b) 308 (c) 398 (d) None of these (e) 223

Direction (70-72): Read the given information carefully and answer the following questions.

Annual sales of a laptop company depend on markets and brand ambassador used to advertise the product. Market is of three states: State I, State II and State III with probabilities of 0.4, 0.4 and 0.3 respectively. Per unit selling price and cost price of a laptop is Rs. 40000 and Rs. 38500 respectively. The given table shows the annual targeted sales (number of units) of the company. (assume there is no change in cost of selling and cost price of laptop after advertising with brand ambassador).

	State I	State II	State III
With brand ambassador	10000	8000	5000
Without brand ambassador	8000	5000	3000

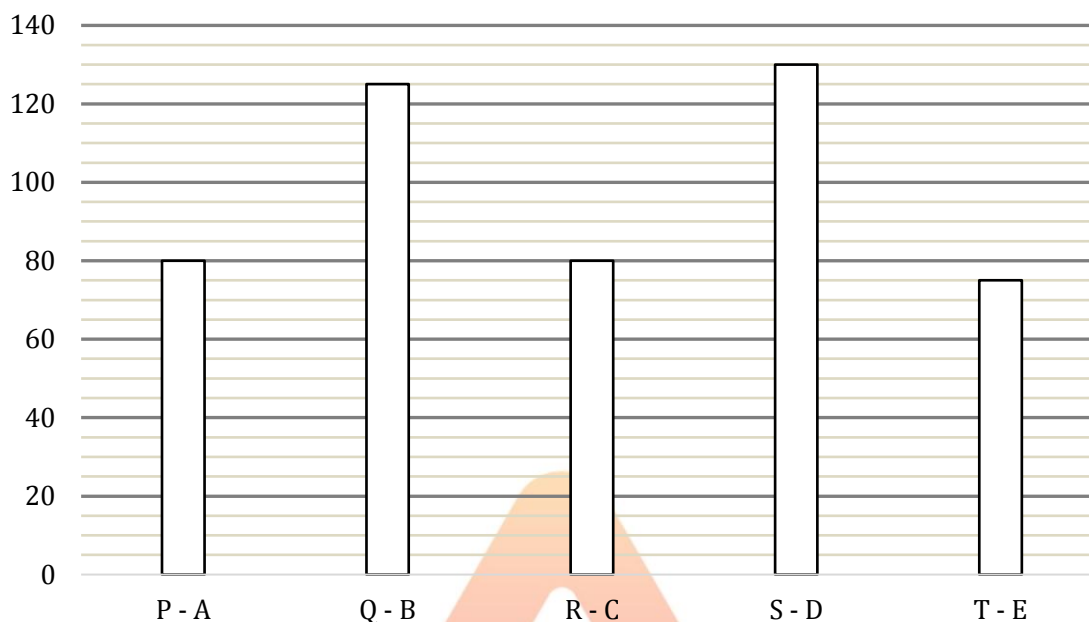
Expected profit of company = $\sum XiPi$

Where, Xi = Profit

Pi = Probability of each market state.

70. The maximum amount that the company can afford to pay its brand ambassador.
 (a) Rs. 45 lakhs (b) Rs. 39 lakhs (c) Rs. 36 lakhs (d) Rs. 40 lakhs (e) Rs. 42 lakhs
71. If company signed a contract with Mr. X to be a brand ambassador of company for Rs. 24.5 lakh then find the increment in the profit on selling a unit of laptop in the market?
 (a) Rs. 150 (b) Rs. 175 (c) Rs. 183.34 (d) Rs. 160 (e) Rs. 166.67
72. If signing a contract with Mr. X for Rs. 24.5 lakh, then cost price of a laptop in each state of market goes up by Rs. 100. Find the total profit earned by the company?
 (a) Rs. 5.8 lakhs (b) Rs. 6.2 lakhs (c) Rs. 4.5 lakhs (d) Rs. 5 lakhs (e) Rs. 6.4 lakhs

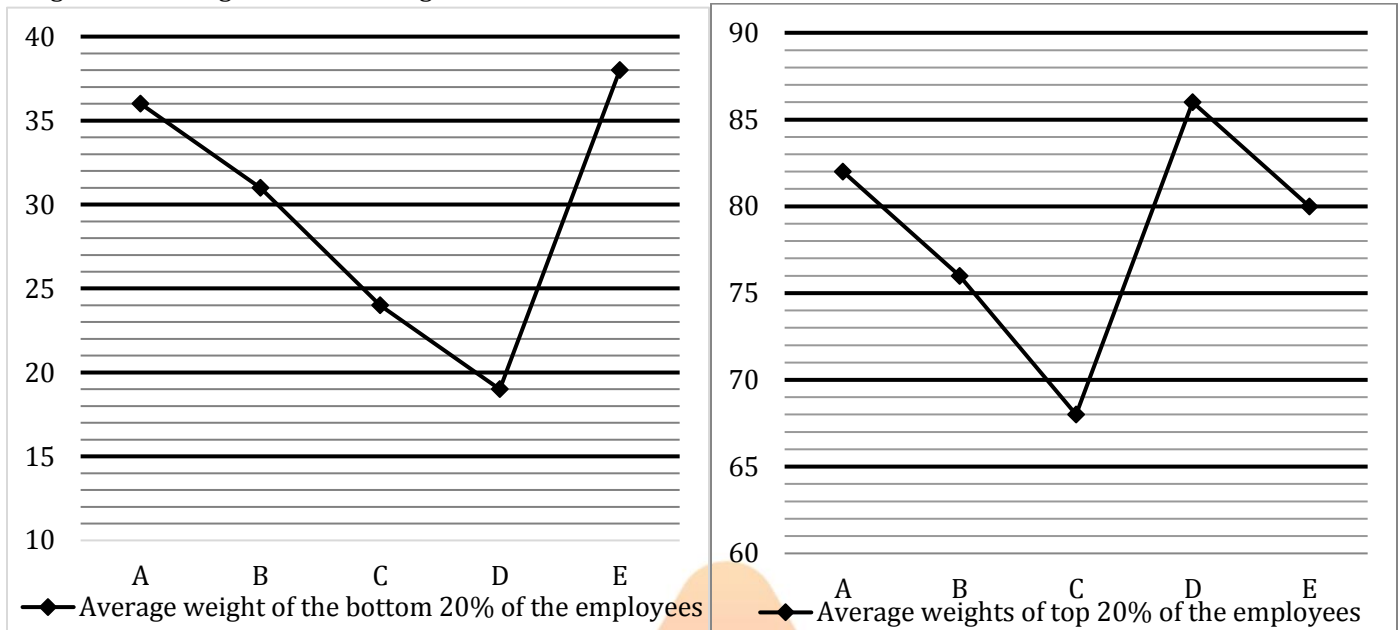
Direction (73 –75): There are ten villages P, Q, R, S, T, A, B, C, D & E. Bar graph shows male population in first five villages P, Q, R, S & T as a percent of male population in last five villages A, B, C, D, & E respectively. Table below shows ratio of female population in first five villages P, Q, R, S & T to last five villages A, B, C, D, & E respectively. Read the data carefully and answer the questions.



Villages	Ratio of female population
P – A	7 : 5
Q – B	1 : 2
R – C	3 : 5
S – D	3 : 4
T – E	1 : 5

- 73.** Male population from A is double of female population in that village. 60% of males and females from P and 80% of males and females from A are taken out, so that average per capita income of this resulting population becomes 40 \$ per day and average per capita income of resulting male population from the two villages is 50 \$ per day. If the difference between total income of the resulting population and total income of resulting male population is 2000 \$, then find the difference between male population to female population in resulting population?
 (a) 48 (b) 56 (c) 54 (d) 46 (e) 84
- 74.** Male population in village Q is 120% more than that of female population in that village and difference between female population in B and Q is 2000. If female population in D is 800 less than male population of Q and ratio of male population to female population in D is 16 : 9, then find male population in S?
 (a) 8320 (b) 8120 (c) 8430 (d) 8350 (e) 8310
- 75.** Total male & female population in village R together is 72% of total male & female population in C. If we mixed population of village R & C in the ratio of 3 : 4 and from resulting population replace $16\frac{2}{3}\%$ with same no. of female population and again replace 10% of resulting population with same no. of female population, then find the ratio of male population to female population in final resulting population?
 (a) 33 : 43 (b) 33 : 41 (c) 33 : 31 (d) 33 : 35 (e) 33 : 37

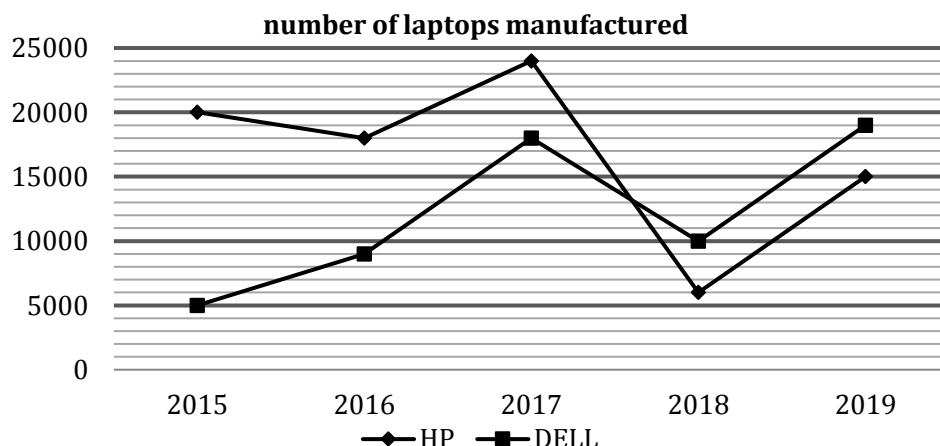
Direction (76–79): The given bar graph shows average weight of the employees of five different organizations when weights are arranged in descending order.



76. If there are 60 employees in the organization D and average weight of the employees is 60 kg, then maximum weight of the employee who is at 48th position.
 (a) 30 kg (b) 54 kg (c) 48 kg (d) 60 kg (e) 65 kg
77. For how many of the given organizations average weight of the remaining 60% of the employees of organization be more than 45 kg if average weight of all the employees for each of the organization is 50 kg.
 (a) 1 (b) 2 (c) 3 (d) 4 (e) 5
78. If in each of the organizations remaining employees has the highest possible average weight, then the 2nd highest average weight is for which organization?
 (a) A (b) B (c) C (d) D (e) E
79. Which of the following option can be the least possible average weight of any organization?
 (a) 32.4 kg (b) 32.6 kg (c) 32.2 kg (d) 30.8 kg (e) 31.4 kg

Directions (80–84): Study the line chart and table carefully and answer the following questions.

Line chart shows the number of laptops manufactured by HP & DELL in 5 different years and table shows the percentage of laptops sold by these 2 companies in given 5 years. Both companies started their production from 2015.



Years	laptops sold by HP	laptops sold by DELL
2015	90%	80%
2016	70%	80%
2017	80%	75%
2018	75%	60%
2019	80%	90%

Note: Laptops available for selling in a particular year = Laptops manufactured in that year + unsold laptops of previous year.

Note: % of laptops sold in a particular year by a company = $\frac{\text{Laptops sold in that year}}{\text{Laptops available for selling in that year}} \times 100$

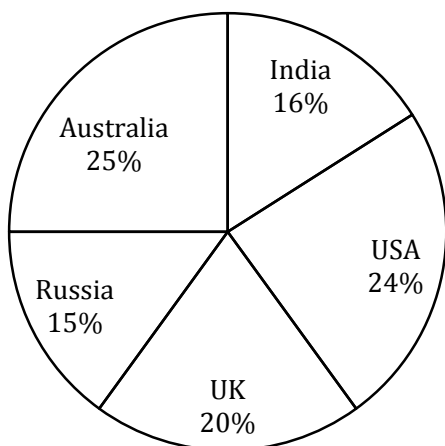
80. Laptops sold by HP & DELL together in 2018 are what percent more/less than total unsold laptops of HP & DELL together in 2016 ?
 (a) 140% (b) 85% (c) 100% (d) 125% (e) 150%
81. Find ratio of total unsold laptops of HP in 2017 & 2018 together to total unsold laptops of DELL in 2015, 2016 & 2019 together.
 (a) 3:2 (b) 7:8 (c) 5:7 (d) 11:17 (e) 18:11
82. Total laptops sold by DELL in 2015, 2016 & 2017 together is what percent of total laptops manufactured by HP in 2017 & 2018 together?
 (a) 20% (b) 90% (c) 60% (d) 40% (e) 70%
83. If manufacturing cost of each laptop of HP & DELL for given all years is Rs.13500 & Rs.18000 respectively, then what is the total manufacturing cost of HP & DELL together in 2015 & 2016 together?
 (a) Rs. 76.5 crores (b) Rs. 45.5 crores (c) Rs. 57.5 crores (d) Rs. 69.5 crores (e) Rs. 61.5 crores
84. Total laptop sold by HP in 2017 & 2019 together are how many more/less than total laptop sold by DELL in 2017 & 2019 together?
 (a) 1000 (b) 2500 (c) 1500 (d) 2100 (e) 900

Directions (85-89): Study the pie chart and table given below carefully and answer the following questions.

Pie chart shows percentage distribution of total number of candidates who applied for scholarship of CFA in 5 different countries (India, USA, UK, Russia and Australia) and table shows percentage of candidates who received scholarships out of total candidates who applied for scholarship in each of these 5 countries.

Total candidates who applied for scholarship of CFA = Candidates received scholarship + Candidates who do not received scholarship

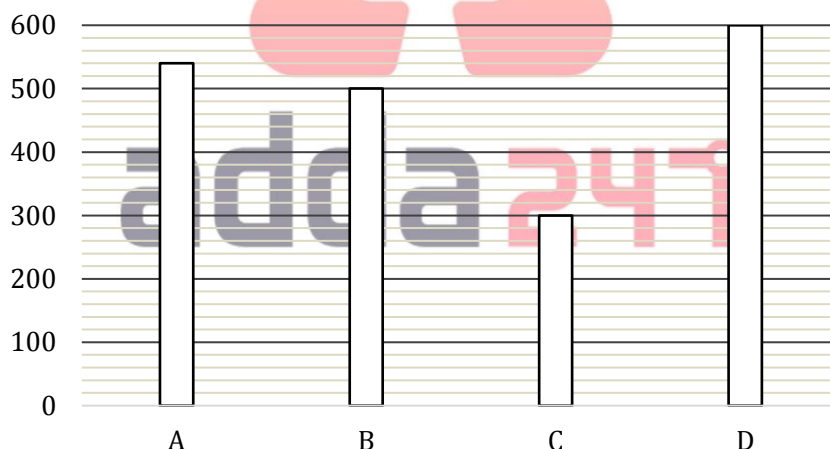
Total number of candidates who applied for scholarship of CFA



Countries	% of candidates who received scholarships
India	15%
USA	20%
UK	18%
Russia	20%
Australia	16%

85. If number of candidates who did not got scholarship in Russia are 22,000 less than number of candidates who did not got scholarship in UK, then find number of candidates who applied for scholarship from India
 (a) 80,000 (b) 75,000 (c) 72,000 (d) 85,000 (e) 90,000
86. Average number of candidates who did not got scholarship of CFA in UK and Russia are what percent more or less than total number of candidates who got scholarship of CFA in India, UK and Australia together?
 (a) 50% (b) 64% (c) 42% (d) 48% (e) 56%
87. If average number of candidates who got scholarship of CFA in USA, UK and Russia is 34,200, then find total number of candidates who applied for scholarship in India and Australia together.
 (a) 3,96,000 (b) 4,52,000 (c) 3,05,000 (d) 3,69,000 (e) 2,88,000
88. If 30% of candidates who got scholarship in India and 40% of candidates who got scholarship in Russia can't take benefit of scholarship as they have registered for CFA before getting scholarship, then find candidates who took benefit of scholarship in India and Russia together are what percent of candidates who got scholarship in India and Russia together?
 (a) $34\frac{4}{9}\%$ (b) $64\frac{4}{9}\%$ (c) $54\frac{4}{9}\%$ (d) $74\frac{4}{9}\%$ (e) $44\frac{4}{9}\%$
89. Find ratio of candidates who did not got scholarship in India to candidates who got scholarship in USA and Australia together.
 (a) 7:3 (b) 11:8 (c) 9:5 (d) 5:8 (e) 17 : 11

Direction (90-93): - Tata has four manufacturing units (A, B, C & D) and in each unit manufactured two types of vehicles (six wheelers and four wheelers) both. Bar graph given below shows increase or decrease in total number of vehicles manufactured by Tata in 2020 in these four units as compare to 2019 (previous year). Table shows total manufactured four wheelers' vehicles either more or less (in %) than total manufactured six wheelers in these units in 2020. Study the data carefully and answer the following questions



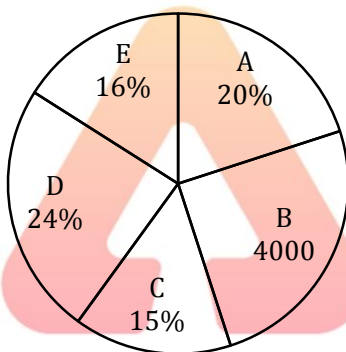
Units	Total manufactured four wheelers vehicles more or less (in %) than total manufactured six wheelers
A	+ 50%
B	- 75%
C	- 40%
D	+ 75%

Note – '+' denotes more and '-' denotes less.

90. In unit A, total number of four wheelers manufactured in 2020 is 20% more than that of in 2019. If change in the number of four wheelers manufactured in unit A in 2020 over 2019 is 25% more than change in number of six wheelers manufactured in unit A in 2020 over 2019, then the total number of six wheelers manufactured in unit A in 2020 is _____.
 (a) 1800 (b) 1200 (c) 1000 (d) 1500 (e) 1600

91. In 2019, Total number of six wheelers manufactured in unit C & D are equal and total number of four wheelers manufactured in unit D are 1080 more than four wheelers manufactured in unit C. If in 2020, total number of vehicles manufactured by both units (C & D) increases as compare to previous year and total number of six wheelers manufactured in both units are equal, then the total number of vehicles manufactured by unit D in 2020 is _____.
 (a) 3300 (b) 2400 (c) 1920 (d) 3000 (e) 3600
92. In 2019 and in 2020 ratio of total vehicles manufactured by units C to that of by unit B is 4 : 5 and 5 : 8 respectively. If total vehicles manufactured by unit C in 2020 is decreased in 2020 over 2019, then total vehicles manufactured by units B in 2019.
 (a) 3900 (b) 3200 (c) 2400 (d) 2800 (e) 3500
93. In 2020, total vehicles manufactured by of all four units increases as compare to previous years 2019. If total vehicles manufactured by of all four units in 2019 is 2060 and the ratio of total vehicles manufactured by A, B, C & D in 2020 is 2 : 3 : 2 : 3 respectively, then the total number of six wheelers manufactured in unit A in 2020 is _____ more than the total number of six wheelers manufactured in unit C in 2020?
 (a) 80 (b) 100 (c) 120 (d) 180 (e) 160

Directions (94-97): Pie-chart shows the distribution of students in 5 different streams of a college. And table given below shows the passing % of boys, girls and total students within the streams. Study the data carefully and solve the following questions



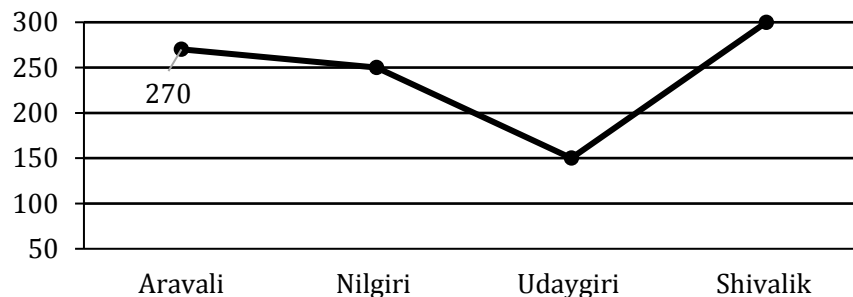
Stream	Boys	Girls	Total
A	40%	50%	—
B	50%	60%	—
C	—	—	60%
D	75%	—	—
E	60%	—	80%

Note:

- (i) There are only 5 streams are in college.
 (ii) Some values are missing you have to calculate it according to questions.

94. Number of girls in stream E is 200% more than the number of boys in same stream. What is the passing percentage of the girls in stream E. (approx.)?
 (a) 84% (b) 87% (c) 92% (d) 62% (e) 70%
95. If ratio between number of boys to number of girls in stream A is 2 : 3 then find the total passing percentage of students in stream A.
 (a) 48% (b) 44% (c) 46% (d) 54% (e) 50%
96. Number of boys passed in stream E is 76 more than that of stream B and total student passed in stream B is 252 more than that of stream E. Find the % of girls passed in stream E.
 (a) 72% (b) 82% (c) 98% (d) 92% (e) 86%
97. Number boys passed in stream C, which is 80% of total boys in stream C, is equal to that of in stream E. If total girls and pass % of girls in both streams are equal then find the fail % of girls in stream 'C' out of total girls in stream 'C'.
 (a) 15% (b) $13\frac{1}{3}\%$ (c) $11\frac{2}{3}\%$ (d) 10% (e) $8\frac{1}{3}\%$

Direction (98-100): - A school has four hostels in which there are two sections one for boys and one for girls. Line chart given below shows increase/decrease in total number of students in 2013 in these hostels as compare to 2012(previous year). Table given below shows ratio between number of boys to number of girls in these hostels in 2013. Study the data carefully and answer the following questions



Hostel	Boys : Girls
Aravali	2 : 3
Nilgiri	4 : 1
Udaygiri	5 : 3
Shivalik	4 : 7

- 98.** In Aravali, number of girls in 2013 is 20% more than that in 2012. If change in the number of girls in Aravali is 25% greater than change in number of boys in Aravali then find the Number of boys in Aravali in 2013.
 (a) 900 (b) 600 (c) 500 (d) 750 (e) 800
- 99.** Number of students is increases and decreases in Aravali and Nilgiri in 2013 respectively as compare to 2012. Number of girls who left Aravali joins Nilgiri (No other change in Number of girls) such that ratio between increase and decreases in Number of boys in Aravali and Nilgiri in 2013 as compare to 2012 is 16 : 15, then find the change in Number of boys in Nilgiri?
 (a) 350 (b) 320 (c) 300 (d) 420 (e) 400
- 100.** In 2012, Number of boys in Udaygiri and Shivalik are equal and Number of girls in Shivalik is 540 more than the Number of girls in Udaygiri. If in 2013, Number of boys in both hostels are equal then find the Number of total students in Shivalik, If In 2013 strength of both hostels increases as compare to previous year
 (a) 1650 (b) 1200 (c) 960 (d) 1500 (e) 900

Practice MCQs for Mains_(Solutions)

- 1. (a):** No. of vacancy for SC/ST category in area A =
 $48000 \times \frac{23.7}{100} - (5000 + 4480)$
 $= 11376 - 9480$
 $= 1896$
 No. of vacancy for OBC category in area B =
 $48000 \times \frac{10.8}{100} - (2000 + 1888)$
 $= 5184 - 3888$
 $= 1296$
 Required difference = $1896 - 1296 = 600$ more
- 2. (b):** No. of vacancy for SC/ST category in area C =
 $1888 + 1612 = 3500$
 No. of vacancy for General category in area C =
 $2000 \times \frac{420}{100} = 8400$

No. of vacancy for OBC category in area C =
 $48000 \times \frac{35}{100} - (3500 + 8400)$
 $= 4900$
 Required ratio = 8400:4900:3500
 $= 12:7:5$

- 3. (c):** No. of vacancy for General category in area E
 $= 48000 \times \frac{12.5}{100} - (2000 + 1000)$
 $= 6000 - 3000$
 $= 3000$
 Required percentage = $\frac{4900-3000}{3000} \times 100 = \frac{1900}{3000} \times 100 \approx 63\%$ more
- 4. (b):** required ratio = $(23.7 + 12.5):18$
 $= 36.2:18 = 181:90$

5. (d): Let vacancy for OBC and SC/ST in area D is x and y respectively.
 ATQ
 $x - y = 936$ (i)
 $x + y = 48000 \times \frac{18}{100} - 5544$
 $x + y = 8640 - 5544$
 $x + y = 3096$ (ii)
 On solving $x = 2016$ and $y = 1080$
 Required difference = $1080 - 1000 = 80$
6. (e): Let price of each ticket of Flight in City Y be Rs. $5x$.
 So, price of each ticket of Flight in city X = $5x \times \frac{60}{100}$
 = Rs. $3x$
 ATQ,
 $3x \times 100 + 5x \times 40 = \frac{40}{100} \times 1000000$
 $\Rightarrow 500x = 400000$
 $\Rightarrow x = 800$
 Required difference = $3 \times 800 \times 100 - 5 \times 800 \times 40 = \text{Rs. } 80000$
7. (c): Let price of each ticket of train in city X be Rs. x .
 So, price of each ticket of train in city Y = Rs. $(x + 260)$
 ATQ,
 $x \times 250 + (x + 260) \times 200 = \frac{41.2}{100} \times 1000000$
 $250x + 200x + 52000 = 412000$
 $\Rightarrow 450x = 360000$
 $\Rightarrow x = 800$
 Total revenue of city X from train tickets = $250 \times 800 = \text{Rs. } 2,00,000$
 Total revenue of city Y from train tickets = $200 \times (800 + 260) = \text{Rs. } 212000$
 Required% = $\frac{212000 - 200000}{200000} \times 100 = 6\%$
8. (d): Economy tickets of flight sold in city X & city Y together = $100 \times \frac{3}{4} + 40 \times \frac{5}{8}$
 = 100
 Required difference = $\left(\frac{150 + 160}{2}\right) - \frac{100}{2} = 155 - 50$
 = 105
9. (c): Let revenue of city X from bus tickets be Rs. $300x$.
 So, revenue of city Y from bus tickets = $300x \times \frac{640}{300}$
 = Rs. $640x$
 ATQ,
 $300x + 640x = \frac{18.8}{100} \times 1000000$
 $940x = 188000$
 $x = 200$
 Price of per bus ticket in city X = $\frac{300 \times 200}{150} = \text{Rs. } 400$
 Price of per bus ticket in city Y = $\frac{640 \times 200}{160} = \text{Rs. } 800$
 Required difference = $800 - 400 = \text{Rs. } 400$

10. (b): Required ratio = $\frac{150 + 250}{160 + 40} = \frac{400}{200} = 2 : 1$

11. (b): Let per ticket price of flight in city X be Rs. $4x$.
 So, per ticket price of flight in city Y = $4x \times \frac{15}{4} = \text{Rs. } 15x$
 ATQ,
 $4x \times 100 + 15x \times 40 = \frac{40}{100} \times 1000000$
 $\Rightarrow 1000x = 400000$
 $x = 400$
 For next year,
 Per ticket price of flight in city X = $4 \times 400 \times \frac{140}{100} = \text{Rs. } 2240$
 Per ticket price of flight in city Y = $15 \times 400 \times \frac{50}{100} = \text{Rs. } 3000$
 Required amount = $2240 \times 100 + 3000 \times 40$
 = $224000 + 120000$
 = Rs. 344000
 = Rs. 3.44 lacs

12. (d): Let the number of total employees in the firm be $100x$
 Number of employees in finance department = $20x$
 number of employees of age group 35-40 in finance department = $20x \times 0.25 = 5x$
 Number of employees in operation department = $10x$
 Number of employees of age group 25-30 in operations department = $10x \times 0.2 = 2x$
 Required % = $\frac{5x + 2x}{2x} \times 100 = 150\%$
13. (c): Let the number of total employees in the firm be $100x$
 Total number of employees in the firm of age group more than 45 years =
 = $\{(10x \times 0.1) + (40x \times 0.1) + (20x \times 0.15) + (20x \times 0.15) + (10x \times 0.05)\} = 11.5x$
 Required % = $\frac{11.5x}{100x} \times 100 = 11.5\%$

14. (b): Let the total number of employees in the firm be $100x$
 total number of employees in the IT department of age group 25 - 30 = $40x \times 0.2 = 8x$
 ATQ
 $8x = 60$
 $x = 7.5$
 total number of employees in the firm = 750
 number of employees in the marketing department who belong to the age group of 40 - 45 =
 $750 \times 0.2 \times 0.3 = 45$

15. (a): Let the total number of employees in the firm be $100x$
 Number of employees in Finance department whose age is more than 45 years $= 20x \times 0.15 = 3x$
 ATQ,
 Total number of employees in the firm $= 5000$
 number of employees in Finance department of age group 30 – 35 years $= (1000 \times 0.1) + 150 = 250$

16. (b): Let the number of employees in the firm be $100x$
 Then number of employees in IT $= 40x$
 Number of employees in operation $= 10x$
 ATQ
 $40x \times 0.1 - 10x \times 0.25 = 45$
 $x = 30$
 Total number of employees in the firm $= 3000$
 Required average $= \frac{1}{2} \times \frac{30}{100} \times 3000 = 450$

17. (b): Non – defective pens of A & D together in 2015
 $= \left(12000 \times \frac{100-20}{100}\right) + \left(21000 \times \frac{100-20}{100}\right)$
 $= 9600 + 16800$
 $= 26400$
 Defective pens of A, B & C together in 2017 $=$
 $\left(10000 \times \frac{10}{100}\right) + \left(20000 \times \frac{15}{100}\right) + \left(24000 \times \frac{25}{100}\right)$
 $= 1000 + 3000 + 6000$
 $= 10000$
 Required % $= \frac{26400}{10000} \times 100$
 $= 264\%$

18. (e): Average of defective pens of A, C & D in 2016
 $= \frac{1}{3} \times \left(\left(8000 \times \frac{25}{100}\right) + \left(20000 \times \frac{15}{100}\right) + \left(16000 \times \frac{25}{100}\right) \right)$
 $= \frac{1}{3} \times (2000 + 3000 + 4000)$
 $= 3000$
 Average of non-defective pens of A & B in 2015
 $= \frac{1}{2} \times \left(\left(12000 \times \frac{100-20}{100}\right) + \left(18000 \times \frac{100-25}{100}\right) \right)$
 $= \frac{1}{2} \times (9600 + 13500)$
 $= 11550$
 Non-defective pens of A & D in 2017 together
 $= \left(10000 \times \frac{100-10}{100}\right) + \left(20000 \times \frac{100-30}{100}\right)$
 $= 9000 + 14000$
 $= 23000$
 Required difference $= 23000 - (11550 - 3000)$
 $= 14450$

19. (a): Total manufacturing cost of C in 2017 $= 1.5 \times 24000$
 $= \text{Rs.}36000$

Total revenue of C in 2017 $= 36000 + 4800$
 $= \text{Rs.}40800$
 Total revenue of C from non-defective pens in 2017 $= \left(1.5 \times \frac{140}{100}\right) \times \left(24000 \times \frac{100-25}{100}\right)$
 $= 2.1 \times 18000$
 $= \text{Rs.}37800$
 Total revenue of C from defective pens in 2017 $= 40800 - 37800$
 $= \text{Rs.}3000$
 Selling price of each defective pen of C in 2017 $= \frac{3000}{\frac{24000 \times \frac{25}{100}}{100}}$
 $= \text{Rs.}(0.5)$
 Required % $= \frac{1.5-0.5}{1.5} \times 100$
 $= 66\frac{2}{3}\%$

20. (c): Non-defective pens of A in 2015, 2016 & 2017 together
 $= \left(12000 \times \frac{100-20}{100}\right) + \left(8000 \times \frac{100-25}{100}\right) + \left(10000 \times \frac{100-10}{100}\right)$
 $= 9600 + 6000 + 9000$
 $= 24600$
 Non-defective pens of B in 2015, 2016 & 2017 together
 $= \left(18000 \times \frac{100-25}{100}\right) + \left(15000 \times \frac{100-20}{100}\right) + \left(20000 \times \frac{100-15}{100}\right)$
 $= 13500 + 12000 + 17000$
 $= 42500$
 Required % $= \frac{42500-24600}{42500} \times 100$
 $= 42\frac{2}{17}\%$

21. (c): Non-defective pens of A in 2016 & 2017 together
 $= \left(8000 \times \frac{100-25}{100}\right) + \left(10000 \times \frac{100-10}{100}\right)$
 $= 6000 + 9000$
 $= 15000$
 Defective pens of C & D together in 2017 $=$
 $\left(24000 \times \frac{25}{100}\right) + \left(20000 \times \frac{30}{100}\right)$
 $= 6000 + 6000$
 $= 12000$
 Required difference $= 15000 - 12000$
 $= 3000$

22. (a): Total number of boys in Cricket, Football and Hockey in 2018
 $= \left(20000 \times \frac{20}{100} \times \frac{3}{10}\right) + \left(20000 \times \frac{30}{100} \times \frac{7}{10}\right) + \left(20000 \times \frac{10}{100} \times \frac{3}{5}\right)$
 $= 1200 + 4200 + 1200 = 6600$
 \therefore Required percentage $= \frac{6600}{20000} \times 100 = 33\%$

- 23. (d):** Number of girls in all the games together in 2018

$$= \left(20000 \times \frac{20}{100} \times \frac{7}{10}\right) + \left(20000 \times \frac{30}{100} \times \frac{3}{10}\right) + \left(20000 \times \frac{15}{100} \times \frac{4}{5}\right)$$

$$= 2800 + 1800 + 2400$$

$$= 7000$$
Number of boys in Volleyball and Badminton together in 2018

$$= \left(20000 \times \frac{25}{100} \times \frac{2}{5}\right) + \left(20000 \times \frac{15}{100} \times \frac{1}{5}\right)$$

$$= 2000 + 600$$

$$= 2600$$
Required ratio = $\frac{7000}{2600}$

$$= 35 : 13$$

- 24. (a):** Number of boys in Football in 2018 = $\left(20000 \times \frac{30}{100} \times \frac{7}{10}\right)$

$$= 4200$$
Number of boys in Football in 2019 = $4200 \times \frac{150}{100}$

$$= 6300$$
No. of boys in Cricket in 2018 = $\left(20000 \times \frac{20}{100} \times \frac{3}{10}\right)$

$$= 1200$$
No. of boys in Cricket in 2019 = $1200 \times \frac{120}{100}$

$$= 1440$$
 \therefore No. of girls in Football in 2019 = $6300 \times \frac{1}{2}$

$$= 3150$$
No. of girls in Cricket in 2019 = $1440 \times \frac{7}{5}$

$$= 2016$$
Required sum = $2016 + 3150 = 5166$

- 25. (a):** No. of boys in 2018 in Hockey = $\left(20000 \times \frac{10}{100} \times \frac{3}{5}\right)$

$$= 1200$$
No. of boys in 2019 in Hockey = $1200 \times \frac{120}{100}$

$$= 1440$$
Therefore, No. of girls in 2019 in Hockey = $5000 - 1440$

$$= 3560$$
Now, $\frac{x}{89} = \frac{1440}{3560}$

$$x = \frac{1440 \times 89}{3560}$$
So, $x = 36$

- 26. (b):** No. of girls in Hockey in 2018 = $\left(20000 \times \frac{10}{100} \times \frac{2}{5}\right)$

$$= 800$$
No. of girls in Hockey in 2019 = $800 \times \frac{1335}{400}$

$$= 2670$$
No. of boys in Hockey in 2019 = $4000 - 2670$

$$= 1330$$

- 27. (d):**

Vehicles	Number	Charges per hour	Number of parking hours (rounded off)	Total Cost
2-wheelers	5000	20	2	2,00,000
3-wheelers	1200	30	2	72,000
Cars	3000	50	3	4,50,000

Total amount received = Rs 7,22,000

- 28. (b):**

Vehicles	Number of vehicles	Change per hour	Number of parking hours (rounded off)	Total Cost	
2 - Wheelers	2000	20	3	1,20,000	3,60,000
	3000	20	4	2,40,000	
Cars	1000	50	1	50,000	2,50,000
	2000	50	2	2,00,000	

Required difference

$$= \left(\frac{2,50,000}{3000} - \frac{3,60,000}{5000}\right) = 11.33$$

- 29. (a):**

Vehicles	Number of Vehicle on given date	Number of Vehicle on next date
2-Wheeler	5000	3750
3-Wheeler	1200	1440
Cars	3000	2000
SUVS	1800	2700
Heavy Vehicle	1000	1000
Total	12,000	10,890

$$\text{Required \%} = \frac{3750}{10890} = 34.43$$

- 30. (e):** Parking charges received from heavy vehicles = Rs 4,80,000
Total parking charges received from car and 2-wheelers together = Rs 6,50,000
Required ratio = 48: 65

- 31. (a):** Total employee working in SBI in 2018

$$= \left(105000 \times \frac{14}{100} + .16 \times 105000 \times \frac{14}{100} - 105000 \times \frac{14}{100} \times \frac{10}{100}\right)$$

$$= (14700 + 2352 - 1470)$$

$$= 15582$$
Female employee working in SBI in 2018 = 15582

$$\times \frac{3}{7} = 6678$$
Total female employee working in SBI in 2017 = $105000 \times \frac{14}{100} \times \frac{2}{5} = 5880$
Required percentage = $\frac{798}{5880} \times 100 \approx \frac{800}{5900} \times 100 = 13.57 \approx 13.5\%$

- 32. (b):** Let total male employee working in BOB in 2018 = $100x$
 So, total female employee working in BOB in 2018 = 87.5
 Ratio of male & female employee working in BOB in 2018 = $100 : 87.5 = 8 : 7$
 Total employee working in 2018 in BOB =
 $(105000 \times \frac{20}{100} + 105000 \times \frac{20}{100} \times \frac{12}{100}) - 105000 \times \frac{20}{100} \times \frac{18}{100} = 19740$
 Total female employee working in 2018 in BOB = $19740 \times \frac{7}{15} = 9212$
 Total female employee working in 2017 in BOB = $105000 \times \frac{20}{100} \times \frac{3}{5} = 12600$
 Required difference = $12600 - 9212 = 3388$
- 33. (e):** Total employee working in Canara in 2018 =
 $(105000 \times \frac{15}{100} + 105000 \times \frac{15}{100} \times \frac{20}{100}) - 105000 \times \frac{15}{100} \times \frac{12}{100} = 17010$
 Total female employees working in Canara in 2018 = $17010 - 9010 = 8000$
 Total employee left the Canara = $105000 \times \frac{15}{100} \times \frac{12}{100} = 1890$
 Total female employee left Canara = $(105000 \times \frac{15}{100} \times \frac{2}{5} + 2150) - 8000 = 450$
 So, total male employee left Canara = $1890 - 450 = 1440$
- 34. (e):** Total employee working in BOI in 2018 =
 $(105000 \times \frac{16}{100} + 105000 \times \frac{16}{100} \times \frac{15}{100}) - 105000 \times \frac{16}{100} \times \frac{8}{100} = 17976$
 Total employee working in IDBI in 2018 =
 $(105000 \times \frac{17}{100} + 105000 \times \frac{17}{100} \times \frac{8}{100}) - 105000 \times \frac{17}{100} \times \frac{16}{100} = 16422$
 Required difference = $17976 - 16422 = 1554$
- 35. (e):** Female employee working in PNB in the year 2017 = $105000 \times \frac{18}{100} \times \frac{5}{9} = 10500$
 Total employee working in PNB in 2018 = $105000 \times \frac{18}{100} + 105000 \times \frac{18}{100} \times \frac{(12-8)}{100} = 19656$
 Female employee working in PNB in the year 2018 = $19656 \times \frac{5}{9} = 10920$
 Required difference = $10920 - 10500 = 420$
 Female employee working in BOB in the year 2017 = $105000 \times \frac{20}{100} \times \frac{3}{5} = 12600$
 Required percentage = $420 \times \frac{100}{12600} = 3\frac{1}{3}\%$

- 36. (d):** Total students who do not have Royal elite pass from Q = $6000 \times \frac{15}{100} - 500 = 400$
 Total students who do not have Royal elite pass from T = $6000 \times \frac{20}{100} - 360 = 840$
 Total students who do not have Royal elite pass from R = $6000 \times \frac{28}{100} - 440 = 800$
 Required percentage = $\frac{(400+840)-800}{800} \times 100 = 55\%$
- 37. (b):** Let total girls who do not have Royal elite pass from S be $3a$
 So, total boys who do not have Royal elite pass from S will be $5a$
 Total boys who do not have Royal elite pass from S = $(6000 \times \frac{25}{100} - 700) \times \frac{5a}{8a} = 500$
 Total students who do not have Royal elite pass P & R =
 $(6000 \times \frac{12}{100} - 440) + (6000 \times \frac{28}{100} - 880) = 280 + 800 = 1080$
 Required ratio = $\frac{500}{1080} = 25 : 54$
- 38. (a):** Total students who do not have Royal elite pass from Q & R =
 $(6000 \times \frac{15}{100} - 500) + (6000 \times \frac{28}{100} - 880) = 400 + 800 = 1200$
 Total students = $1200 + 360 = 1560$
 Required central angle = $\frac{1560}{6000} \times 360^\circ = 93.6^\circ$
- 39. (e):** Total girls who play 'Pubg' from R = $6000 \times \frac{28}{100} \times \frac{325}{7} \times \frac{1}{100} = 780$
 Total girls who have Royal elite pass from R = $780 \times \frac{7}{13} = 420$
 Total boys who do not have Royal elite pass from R = $(6000 \times \frac{28}{100} - 780) - (880 - 420) = 440$
- 40. (c):** Total students who have Royal elite pass from 'U' = $(6000 \times \frac{12}{100} - 440) \times \frac{120}{100} = 336$
 Total students who do not have Royal elite pass from 'U' = $336 \times \frac{4}{3} = 448$
 Total students who do not have Royal elite pass from R = $(6000 \times \frac{28}{100} - 880) = 800$
 Required percentage = $\frac{800-448}{800} \times 100 = \frac{352}{800} \times 100 = 44\%$

Sol (41-45):**Company A -**

Let total employees who do not prefer any mode of vehicle = $2x$

So, total employees prefer metro = $3x$

Total employees who do not prefer any mode of vehicle = $(100 - 40 - 35)\% \times \frac{2x}{5x} = 10\%$

Total employees who do not prefer any mode of vehicle = $240 \times \frac{10}{100} = 24$

Total no. of employees who prefer metro = $24 \times \frac{3x}{2x} = 36$

Employee who prefer cab = $240 \times \frac{40}{100} = 96$

Employee who prefer auto = $240 \times \frac{35}{100} = 84$

Company B -

Let total employees who do not prefer any mode of vehicle = $3x$

So, total employees prefer Auto = $5x$

Total employees who do not prefer any mode of vehicle = $(100 - 25 - 15)\% \times \frac{3x}{8x} = 22.5\%$

Total employees who do not prefer any mode of vehicle = $320 \times \frac{22.5}{100} = 72$

Employees who prefer auto = $72 \times \frac{5x}{3x} = 120$

Employee who prefer metro = $320 \times \frac{15}{100} = 48$

Employee who prefer cab = $320 \times \frac{25}{100} = 80$

Company C -

Total employees prefer cab = $450 \times \frac{40}{100} + 20 = 200$

Total employees who do not prefer any mode of vehicle = $450 - (200 + 180 + 54) = 16$

Employees who prefer metro = $450 \times \frac{12}{100} = 54$

Employees who prefer auto = $450 \times \frac{40}{100} = 180$

Company D -

Company who do not prefer any mode of vehicle from C = $72 - 2 = 70$

Employees prefer auto = $400 \times \frac{45}{100} = 180$

Let no. of employees who prefer metro = $2x$

then, no. of employees who prefer cab = $2x \times \frac{150}{100} = 3x$

ATQ

employees who prefer metro = $\frac{400 - 180 - 70}{5x} \times 2x$

= $\frac{150}{5} \times 2 = 60$

Employees who prefer cab = $60 \times \frac{3}{2} = 90$

41. (b): Total employee who do not prefer any mode of vehicle from all the four companies

$$= 24 + 72 + 16 + 70 = 182$$

$$\text{Required percentage} = \frac{182}{(240 + 320 + 450 + 400)} \times 100 = 12.9 \approx 13\%$$

42. (d): Required ratio = $\frac{36}{120} = 3 : 10$

43. (e): Required percentage = $\frac{200 - 72}{200} \times 100 = 64\%$

44. (c): Required difference = $(90 + 60) - 70 = 80$

45. (a): Required percentage = $\frac{200}{(90 + 60)} \times 100 = 133\frac{1}{3}\%$

46. (b): Number of female employees in C who are newly recruited

$$= \left(\left(2000 \times \frac{30}{100} \right) - 350 \right) \times \frac{38}{100} = 95$$

Number of male employees in C who are newly recruited = $95 \times \frac{3}{5} = 57$

$$\begin{aligned} \text{Required \%} &= \frac{\left(\left(2000 \times \frac{30}{100} \right) - (95 + 57) \right)}{2000 \times \frac{30}{100}} \times 100 \\ &= \frac{600 - 152}{600} \times 100 \\ &= 74\frac{2}{3}\% \end{aligned}$$

47. (a): Male employees in company - Y = $\frac{400}{100} \times 350 = 1400$

Female employees in company - Y = $1400 \times \frac{3}{4} = 1050$

Required difference = $(1400 + 1050) - 2000 = 450$

48. (c): Female employees who left B = $\left(\left(2000 \times \frac{25}{100} \right) - 225 \right) \times \frac{16}{100} = 44$

Female employees in D = $\left(2000 \times \frac{20}{100} \right) - 160 = 240$

$$\begin{aligned} \text{Required \%} &= \frac{(240 + 44) - 240}{240} \times 100 \\ &= 18\frac{1}{3}\% \end{aligned}$$

49. (b): Male employees in company - K = $\left(\left(2000 \times \frac{25}{100} \right) - 225 \right) + 425 = 700$

Average number of female employees in A, C & D in company - X

$$\begin{aligned}
 &= \frac{1}{3} \times \left(\left(2000 \times \frac{75}{100} \right) - (240 + 350 + 160) \right) \\
 &= \frac{1}{3} \times (750) \\
 &= 250 \\
 \text{Required difference} &= 700 - 250 \\
 &= 450
 \end{aligned}$$

- 50. (d):** Employees who are in (18-40) age group in A = $\left(2000 \times \frac{25}{100} \right) \times \frac{13}{25} = 260$
 Employees who are in (18-40) age group in B = $\left(2000 \times \frac{25}{100} \right) \times \frac{13}{50} = 130$
 Employees who are in (18-40) age group in C = $\left(2000 \times \frac{30}{100} \right) \times \frac{4}{5} = 480$
 Employees who are in (18-40) age group in D = $\left(2000 \times \frac{20}{100} \right) \times \frac{33}{40} = 330$
 Employees who are in (40+) age group in A, B, C & D in company - X
 $= 2000 - (260 + 130 + 480 + 330)$
 $= 800$
 Required ratio = $\frac{(260+130+480+330)}{800}$
 $= 3 : 2$

- 51. (c):** Total number of pens produced by = $\frac{15}{100} \times 30000 = 45000$
 Number of pens sold by R and S together = $300000 \left(\frac{9}{100} \times \frac{74}{100} + \frac{23}{100} \times \frac{64}{100} \right) = 64140$
 Required % = $\frac{64140 - 45000}{64140} \times 100$
 $= 29.84 \approx 30\%$

- 52. (a):** Number of pens sold by Company U = $300000 \times \frac{21}{100} \times \frac{74}{100} = 46620$
 Number of pens sold by company S = $300000 \times \frac{23}{100} \times \frac{64}{100} = 44160$
 Required difference = 2460

- 53. (c):** Unsold pens of company P = $\frac{18}{100} \times 300000 \times \frac{18}{100} = 9720$
 Unsold pens of company Q = $300000 \times \frac{15}{100} \times \frac{30}{100} = 13500$
 Unsold pens of company U = $300000 \times \frac{21}{100} \times \frac{26}{100} = 16380$
 Required average = $\frac{9720+13500+16380}{3}$
 $= 13200$

- 54. (d):** Total number of pens produced by company P, R and T together
 $= \frac{41}{100} \times 300000$
 $= 123000$
 Total number of pens sold by P, R and T company
 $= \frac{18}{100} \times 300000 \times \frac{82}{100} + \frac{9}{100} \times \frac{74}{100} \times 300000 + \frac{14}{100} \times \frac{80}{100} \times 300000$
 $= 97860$
 Required % = $\frac{97860}{123000} \times 100$
 $\approx 80\%$

- 55. (a):** hatchback cars in parking lot A = $\frac{500}{100} \times 30 \times \frac{8}{15} = 80$
 hatchback cars in parking lot B = $\frac{500}{100} \times 20 \times \frac{4}{10} = 40$
 Total hatchback cars in parking lots A & B = $80 + 40 = 120$

- 56. (d):** Sedan cars in parking lot C = $\frac{500}{100} \times 15 \times \frac{4}{15} = 20$
 SUV cars in parking lot D = $\frac{500}{100} \times 35 \times \frac{2}{7} = 50$
 Required ratio = 20 : 50
 $= 2 : 5$

- 57. (c):** Required average = $\frac{\left[\frac{30}{15} \times 5 + \frac{20}{10} \times 3 + \frac{15}{15} \times 4 + \frac{35}{7} \times 2 \right] \times \frac{500}{100}}{4}$
 $= \frac{(10+6+4+10)}{4} \times 5 = \frac{30}{4} \times 5 = 37.5$

- 58. (e):** Total cars in parking lot A = $\frac{500}{100} \times 30 = 150$
 Cars shifted from parking lot A = 10% of 150 = 15
 SUV cars shifted from parking lot A = $\frac{15}{15} \times 2 = 2$
 SUV cars in parking lot B = $\frac{500}{100} \times 20 \times \frac{3}{10} = 30$
 Total SUV cars in parking lot B now = $30 + 2 = 32$.

- 59. (b):** Sedan cars in parking lot C = $\frac{500}{100} \times 15 \times \frac{4}{15} = 20$
 Hatchback cars in parking lot D = $\frac{500}{100} \times 35 \times \frac{3}{7} = 75$
 Required percentage = $\frac{75-20}{75} \times 100 = \frac{55}{75} \times 100 = 73\frac{1}{3}\%$

- 60. (c):** Total users of all products = $\frac{50}{20} \times 100 \times \frac{100}{25} = 1000$
 Total users of Anand = $\frac{35}{100} \times 1000 = 350$
 Required no. of users = $350 - \left(\frac{10}{100} \times 350 \right) - (105 + 175) = 35$

$$61. (a): \text{Total users of all products} = \frac{50}{20} \times 100 \times \frac{100}{25} = 1000$$

$$\text{Users of Anand having policy life 0-1 year} = \frac{1000}{100} \times 35 \times \frac{10}{100} = 35$$

$$\text{Users of Sugam having policy life 0-1 yr} = 2 \times 50 = 100$$

$$\text{Required users} = 35 + 100 + 80 = 215$$

$$62. (d): \text{Total users of all products} = \frac{50}{20} \times 100 \times \frac{100}{25} = 1000$$

$$\text{Users of Saral having policy life 3-5 yr} = \frac{20}{100} \times 1000 - \left(80 + 60 + \frac{15}{100} \times \frac{20}{100} \times 1000\right) = 30$$

$$\text{Required \%} = \frac{175 - (60+30)}{(60+30)} \times 100 = \frac{85}{90} \times 100 \approx 95\%$$

63. (d): Since percentage distribution of sugam policy for (0-1)yr & (1-3) yrs is not known
So we can't determine

64. (e):

$$\text{Users of Anand having life of more than 5 years} = \frac{1000}{100} \times 35 - \left(105 + 175 + \frac{10}{100} \times 350\right) = 35$$

$$\text{Users of Sugam having life 1-3 years} = \text{Users of Saral having life 3-5 yrs}$$

$$= \frac{1000}{100} \times 20 - \left(80 + 60 + \frac{15}{100} \times 1000 \times \frac{20}{100}\right) = 30$$

$$\text{Users of Saral having life more than 3 years} = \frac{1000}{100} \times 20 - (80 + 60) = 60$$

$$\text{Required ratio} = (35 + 30) : 60 = 65 : 60 = 13 : 12$$

$$65. (a): \text{Males in Draftsman course} = \frac{20}{100} \times 1000 \times \frac{65}{100} = 130$$

$$\text{Males in Hardware course} = \frac{20}{100} \times 1000 \times \frac{55}{100} = 110$$

$$\text{Required ratio} = \frac{130}{110} = 13 : 11$$

$$66. (e): \text{Females in Stitching and Accounting} = \frac{25}{100} \times 1000 \times \frac{70}{100} + \frac{8}{100} \times 1000 \times \frac{55}{100} = 175 + 44 = 219$$

$$\text{Males in Networking and Electrician} = \frac{15}{100} \times 1000 \times \frac{50}{100} + \frac{12}{100} \times 1000 \times \frac{70}{100} = 75 + 84 = 159$$

$$\text{Required percentage} = \frac{219-159}{159} \times 100 = 37.74\%$$

$$67. (c): \text{Total males} = \left(\frac{15}{100} \times \frac{50}{100} + \frac{12}{100} \times \frac{70}{100} + \frac{20}{100} \times \frac{65}{100} + \frac{25}{100} \times \frac{30}{100} + \frac{8}{100} \times \frac{45}{100} + \frac{20}{100} \times \frac{55}{100}\right) \times 1000 = 510$$

68. (b): in next year

$$\text{Total trainees in Networking} = \frac{15}{100} \times 1000 \times \frac{110}{100} = 165$$

$$\text{Females in Networking} = \frac{50}{100} \times 150 \times \frac{120}{100} = 90$$

$$\text{Males in Networking} = 165 - 90 = 75$$

$$\text{Total trainees in Stitching} = \frac{25}{100} \times 1000 \times \frac{120}{100} = 300$$

$$\text{Females in Stitching} = \frac{70}{100} \times 250 \times \frac{120}{100} = 210$$

$$\text{Males in Stitching} = 300 - 210 = 90$$

$$\text{Required average} = \frac{75+90}{2} = 82.5$$

69. (e): Average of total males in Hardware, Accounting and Draftsman course

$$= \frac{1}{3} \times \left(\left(\frac{20}{100} \times 1000 \times \frac{55}{100}\right) + \left(\frac{8}{100} \times 1000 \times \frac{45}{100}\right) + \left(\frac{20}{100} \times 1000 \times \frac{65}{100}\right)\right)$$

$$= \frac{1}{3} \times (110 + 36 + 130) = 92$$

Total females in all the courses except Stitching course

$$= 1000 \times \left(\left(\frac{15}{100} \times \frac{50}{100}\right) + \left(\frac{12}{100} \times \frac{30}{100}\right) + \left(\frac{20}{100} \times \frac{35}{100}\right) + \left(\frac{8}{100} \times \frac{55}{100}\right) + \left(\frac{20}{100} \times \frac{45}{100}\right)\right) = 315$$

$$\text{Required difference} = 315 - 92 = 223$$

70. (b): maximum profit given to brand ambassador is the increase in profit of company after advertising with brand ambassador.

$$\text{Required sum} = (40000 - 38500)[(10000 - 8000) \times 0.4 + (8000 - 5000) \times 0.4 + (5000 - 3000) \times 0.3]$$

$$\Rightarrow 1500 \times (800 + 1200 + 600)$$

$$\Rightarrow 39 \text{ lakhs}$$

71. (e): Expected profit when advertised with brand ambassador

$$= (40,000 - 38,500) \times [10,000 \times 0.4 + 8000 \times 0.4 + 5000 \times 0.3] = 130.5 \text{ lakhs.}$$

Expected profit without brand ambassador

$$= (40,000 - 38,500) \times [8000 \times 0.4 + 5000 \times 0.4 + 3000 \times 0.3] = 91.5 \text{ lakh.}$$

$$\text{Maximum sum can be paid to brand ambassador} = 130.5 - 91.5 = 39 \text{ lakhs}$$

$$\text{Increase in profit of company after payment to brand ambassador} = 39 - 24.5 = 14.5 \text{ lakh}$$

Let increment in profit per unit is Rs. x

ATQ

$$x \times [10000 \times 0.4 + 8000 \times 0.4 + 5000 \times 0.3] = 1450000$$

$$x = \frac{1450000}{8700} = \text{Rs. } 166.67$$

- 72. (a):** maximum profit that can be earned when advertised with brand ambassador

$$(40000 - 38500 - 100)[10000 \times 0.4 + 8000 \times 0.4 + 5000 \times 0.3] = 121.8 \text{ lakhs}$$

Expected profit without brand ambassador

$$= (40,000 - 38,500) \times [8000 \times 0.4 + 5000 \times 0.4 + 3000 \times 0.3] = 91.5 \text{ lakh.}$$

Net profit earned by company after payment to brand ambassador = $(121.8 - 91.5 - 24.5) = 5.8 \text{ lakhs}$

- 73. (d):** Let male and female population in village A be $100x$ and $50x$ respectively

$$\text{Male population in village P} = 100x \times \frac{80}{100} = 80x$$

$$\text{Female population in village P} = 50x \times \frac{7}{5} = 70x$$

$$\text{Total no. of resulting male} = 80x \times \frac{60}{100} + 100x \times \frac{80}{100} = 128x$$

$$\text{Total no. of resulting female} = 50x \times \frac{80}{100} + 70x \times \frac{60}{100} = 82x$$

$$\text{Total no. of resulting population} = 128x + 82x = 210x$$

ATQ

$$210x \times 40 - 128x \times 50 = 2000$$

$$x = 1$$

$$\text{Required difference} = 128 - 82 = 46$$

- 74. (a):** Female population in Q = $\frac{2000}{2-1} \times 1 = 2000$

$$\text{Male population in Q} = \frac{2000}{100} \times 220 = 4400$$

$$\text{Female population in D} = 4400 - 800 = 3600$$

$$\text{Male population in D} = \frac{3600}{9} \times 16 = 6400$$

$$\text{Male population in S} = \frac{6400}{100} \times 130 = 8320$$

- 75. (e):** Let male population in village R & C be $4a$ & $5a$ respectively

And, female population in village R & C be $3b$ & $5b$ respectively

ATQ -

$$\frac{(4a+3b)}{(5a+5b)} = \frac{18}{25}$$

$$20a + 15b = 18a + 18b$$

$$2a = 3b$$

$$a : b = 3 : 2$$

$$\text{Part of male population in village R} = \frac{12}{18} = \frac{2}{3}$$

$$\text{Part of male population in village C} = \frac{15}{25} = \frac{3}{5}$$

Let part of male population in resulting population = n

By allegation we know

$$\frac{n-3}{\frac{2}{3}-n} = \frac{3}{4}$$

$$n = \frac{22}{35}$$

Let total resulting population = $35y$

Part of male population in resulting population = $22y$

Part of female population in resulting population = $35y - 22y = 13y$

After replacing $16\frac{2}{3}\%$ of resulting population with same amount of female population

$$\text{Remaining male population} = 22y - 22y \times \frac{50}{3} \times \frac{1}{100} = \frac{55y}{3}$$

$$\text{Remaining female population} = 13y - 13y \times \frac{50}{3} \times \frac{1}{100} + 35y \times \frac{50}{3} \times \frac{1}{100} = \frac{50y}{3}$$

Again replaced 10% of resulting population with same female population

$$\text{Male remaining population} = \frac{55y}{3} - \left(\frac{55y}{3} \times \frac{10}{100}\right) = 16.5y$$

$$\text{Remaining female population} = \frac{50y}{3} - \left(\frac{50y}{3} \times \frac{10}{100}\right) + 35y \times \frac{10}{100} = 18.5y$$

$$\text{Required ratio} = \frac{16.5y}{18.5y} = 33 : 37$$

- 76. (e):** Total weight of all employees of Organization D = $60 \times 60 = 3600 \text{ kg}$

Total weight of top 20% and bottom 20% employees.

$$= (86 + 19) \times \frac{20 \times 60}{100} = 105 \times 12 = 1260 \text{ kg}$$

$$\text{Total weight of other employees} = 3600 - 1260 = 2340 \text{ kg}$$

Maximum possible weight of the employee who is at 48th position will be obtained only when the remaining of the employees will have equal weight.

$$\text{Required possible weight} = \frac{2340}{36} = 65.$$

- 77. (c):** Average weight of 40% of employees for each organization

$$\text{For A} - \frac{82+36}{2} = 59$$

$$\text{For B} - \frac{76+31}{2} = 53.5$$

$$\text{For C} - \frac{68+24}{2} = 46$$

$$\text{For D} - \frac{86+19}{2} = 52.5$$

$$\text{For E} - \frac{80+38}{2} = 59$$

For A : Let remaining 60% of employees has average weight of $x \text{ kg}$.

$$\Rightarrow \frac{59 \times 2 + x \times 3}{5} = 50$$

$$\Rightarrow x = 44 \text{ kg}$$

For B : Let remaining 60% of employees had average weight of y kg

$$\Rightarrow \frac{53.5 \times 2 + y \times 3}{5} = 50$$

$$\Rightarrow y = \frac{143}{3} = 47\frac{2}{3} \text{ kg}$$

For C : Let remaining 60% of the employees has average weight of z kg

$$\Rightarrow \frac{46 \times 2 + z \times 3}{5} = 50$$

$$\Rightarrow z = 52\frac{2}{3} \text{ kg}$$

For D : Let remaining 60% of the employees has average weight of p kg.

$$\Rightarrow \frac{52.5 \times 2 + p \times 3}{5} = 50 \Rightarrow p = 48\frac{1}{3} \text{ kg}$$

For E : Let remaining 60% of the employees had average weight of q kg

$$\Rightarrow \frac{59 \times 2 + q \times 3}{5} = 50$$

$$\Rightarrow q = 44 \text{ kg.}$$

So, required answer – B, C, D i.e. 3 organizations

78. (d): For every organization, highest possible average weight of remaining 60% of employees will be equal to average weight of top 20% employees.

For A :

Remaining employees (60%) has the highest possible average weight = 82 kg

$$\text{So, average weight of the organization} = \frac{82 \times 4 + 36}{5} =$$

$$72.8 \text{ kg}$$

For B : average weight of the organization = 67 kg

For C : average weight of the organization = 59.2 kg

For D : average weight of the organization = 72.6 kg

For E : average weight of the organization = 71.6 kg

79. (a): For every organization, least possible average weight will be calculated when average weight of remaining 60% of employees is equal to average weight of bottom 20% of the employees.

The least possible average weight of A

$$= \frac{82 + 4 \times 36}{5} = 45.2 \text{ kg}$$

For B : least possible average weight = 40 kg

For C : least possible average weight = 32.8 kg

For D : least possible average weight = 32.4 kg

For E : least possible average weight = 46.4 kg

Sol (80-84):

Year	HP			DELL		
	Laptops manufactured	Laptops sold	Unsold laptops	Laptops manufactured	Laptops sold	Unsold laptops
2015	20000	18000	2000	5000	4000	1000
2016	18000	14000	6000	9000	8000	2000
2017	24000	24000	6000	18000	15000	5000
2018	6000	9000	3000	10000	9000	6000
2019	15000	14400	3600	19000	22500	2500

80. (d): Laptops sold by HP & DELL together in 2018 = 9000 + 9000

$$= 18000$$

Total Unsold laptops of HP & DELL together in 2016 = 6000 + 2000

$$= 8000$$

$$\text{Required \%} = \frac{18000 - 8000}{8000} \times 100$$

$$= 125\%$$

81. (e): Total Unsold laptops of HP in 2017 & 2018 together = 6000 + 3000

$$= 9000$$

Total unsold laptops of DELL in 2015, 2016 & 2019 together = 1000 + 2000 + 2500

$$= 5500$$

$$\text{Required ratio} = \frac{9000}{5500}$$

$$= 18:11$$

82. (b): Total laptops sold by DELL in 2015, 2016 & 2017 together = 4000 + 8000 + 15000

$$= 27000$$

Total laptops manufactured by HP in 2017 & 2018 together = 24000 + 6000

$$= 30000$$

$$\text{Required \%} = \frac{27000}{30000} \times 100$$

$$= 90\%$$

83. (a): Total manufacturing cost of HP in 2015 & 2016 together = (20000 + 18000) × 13500

$$= \text{Rs. 51.3 crores}$$

Total manufacturing cost of DELL in 2015 & 2016 together = (5000 + 9000) × 18000

$$= \text{Rs. 25.2 crores}$$

$$\text{Required manufacturing cost} = 51.3 + 25.2 = \text{Rs. 76.5 crores}$$

84. (e): Total Laptops sold by HP in 2017 & 2019 together = $24000 + 14400 = 38400$
 Total Laptops sold by DELL in 2017 & 2019 together = $15000 + 22500 = 37500$
 Required difference = $38400 - 37500 = 900$

85. (a): Let total number of candidates who applied for scholarship in these 5 countries be $100x$.
 Number of candidates who did not got scholarship in Russia = $\left(100x \times \frac{15}{100} \times \frac{100-20}{100}\right) = 12x$
 And, number of candidates who did not got scholarship in UK = $\left(100x \times \frac{20}{100} \times \frac{100-18}{100}\right) = 16.4x$
 ATQ,
 $16.4x - 12x = 22000$
 $x = 5000$
 Required number of candidates = $\left(100 \times 5000 \times \frac{16}{100}\right) = 80,000$

86. (c): Let total number of candidates who applied for scholarship in these 5 countries be $100x$.
 Average number of candidates who did not got scholarship of CFA in UK and Russia
 $= \frac{1}{2} \times \left(\left(100x \times \frac{20}{100} \times \frac{100-18}{100}\right) + \left(100x \times \frac{15}{100} \times \frac{100-20}{100}\right) \right)$
 $= \frac{1}{2} \times (16.4x + 12x) = 14.2x$
 Total number of candidates who got scholarship of CFA in India, UK and Australia together
 $= 100x \times \frac{16}{100} \times \frac{15}{100} + \left(100x \times \frac{20}{100} \times \frac{18}{100}\right) + \left(100x \times \frac{25}{100} \times \frac{16}{100}\right)$
 $= 2.4x + 3.6x + 4x = 10x$
 Required % = $\frac{14.2x - 10x}{10x} \times 100 = 42\%$

87. (d): Let total number of candidates who applied for scholarship in these 5 countries be $100x$.
 ATQ,
 $\frac{1}{3} \times \left(\left(100x \times \frac{24}{100} \times \frac{20}{100}\right) + \left(100x \times \frac{20}{100} \times \frac{18}{100}\right) + \left(100x \times \frac{15}{100} \times \frac{20}{100}\right) \right) = 34,200$
 $4.8x + 3.6x + 3x = 1,02,600$
 $x = 9,000$
 Required number of candidates = $\left(100 \times 9,000 \times \frac{16+25}{100}\right) = 3,69,000$

88. (b): Let total number of candidates who applied for scholarship in these 5 countries be $100x$.
 Candidates who got scholarship in India and Russia together = $\left(100x \times \frac{16}{100} \times \frac{15}{100}\right) + \left(100x \times \frac{15}{100} \times \frac{20}{100}\right)$
 $= 2.4x + 3x = 5.4x$
 Candidates who took benefit of scholarship in India and Russia together = $\left(100x \times \frac{16}{100} \times \frac{15}{100} \times \frac{70}{100}\right) + \left(100x \times \frac{15}{100} \times \frac{20}{100} \times \frac{60}{100}\right)$
 $= 1.68x + 1.8x = 3.48x$
 Required % = $\frac{3.48x}{5.4x} \times 100 = 64\frac{4}{9}\%$

89. (e): Let total number of candidates who applied for scholarship in these 5 countries be $100x$.
 candidates who did not got scholarship in India = $\left(100x \times \frac{16}{100} \times \frac{100-15}{100}\right) = 13.6x$
 Candidates who got scholarship in USA and Australia together = $\left(100x \times \frac{24}{100} \times \frac{20}{100}\right) + \left(100x \times \frac{25}{100} \times \frac{16}{100}\right)$
 $= 4.8x + 4x = 8.8x$
 Required ratio = $\frac{13.6x}{8.8x} = 17:11$

90. (b): Let number of four wheelers manufactured in unit A in 2019 be 'a'
 Number of four wheelers manufactured in unit A in 2020 = $a \times \frac{120}{100} = 1.2a$
 Change in the number of four wheelers manufactured = $1.2a - a = 0.2a$
 So, change in number of six wheelers manufactured in unit A = $\frac{0.2a}{125} \times 100 = 0.16a$
 Total increment in 2020 over 2019 = $0.2a + 0.16a = 0.36a$
 $0.36a = 540$
 $a = \frac{540 \times 100}{36}$
 $a = 1500$
 So, the total number of six wheelers manufactured in unit A in 2020 = $\frac{100}{150} \times 1.2 \times 1500 = 1200$

- 91. (a):** Let total number of six wheelers manufactured in each unit C & D in 2019 = x
 Let total number of four wheelers manufactured in unit C in 2019 = y
 So, total number of four wheelers manufactured in unit D in 2019 = $y + 1080$
 In 2020,
 Let total number of six wheelers manufactured in each unit C & D = $20a$
 Number of four wheelers manufactured in unit D = $20a \times \frac{175}{100} = 35a$
 And, number of four wheelers manufactured in unit C = $20a \times \frac{60}{100} = 12a$
 ATQ
 $x + y + 300 = 32a \dots(i)$
 $x + (y + 1080) + 600 = 55a$
 $x + y + 1680 = 55a$
 Solving (i) and (ii)
 $a = 60$
 Total number of vehicles manufactured by unit D in 2020 = $55a = 55 \times 60 = 3300$
- 92. (e):** Let in 2019, total vehicles manufactured by units C and B be $4x$ and $5x$ respectively
 And total vehicles manufactured by units C and B in 2020 be $5y$ and $8y$ respectively
 ATQ,
 $4x - 5y = 300 \dots(i)$
 Two cases formed
 Either
 $8y - 5x = 500 \dots(ii)$
 Or, $5x - 8y = 500 \dots(iii)$
 On solving (i) and (iii) we go -ve integer value
 So, by solving (i) and (ii)
 $x = 700$
 $y = 500$
 Total vehicles manufactured by units B in 2019 = $5 \times 700 = 3500$
- 93. (d):** Total vehicles manufactured by of all four units in 2020 = $2060 + (540 + 500 + 300 + 600) = 4000$
 Total number of six wheelers manufactured in unit A in 2020 = $\frac{4000}{10} \times 2 \times \frac{2}{5} = 320$
 Total number of six wheelers manufactured in unit C in 2020 = $\frac{4000}{10} \times 2 \times \frac{5}{8} = 500$
 Required Difference = $500 - 320 = 180$
- 94. (b):** Total students in stream E = $\frac{4000}{25} \times 16 = 2560$
 Let number of boys = x
 So, number of girls = $3x$
 So, $x + 3x = 2560$
 $x = 640$

$$3x = 1920$$

$$\text{Total students passed} = \frac{2560 \times 80}{100} = 2048$$

$$\text{Number of boys passed} = \frac{640 \times 60}{100} = 384$$

$$\text{Number of girls passed} = 2048 - 384 = 1664$$

$$\text{Pass percentage of girls} = \frac{1664}{1920} \times 100 \approx 87\%$$

- 95. (c):** Total number of students in stream A = $\frac{4000}{25} \times 20 = 3200$
 Let total boys and girls be $2x$ and $3x$ respectively.
 $5x \rightarrow 3200$
 $x \rightarrow 640$
 Boys $\rightarrow 1280$, Girls $\rightarrow 1920$
 Number of boys passed = $\frac{1280 \times 40}{100} = 512$
 Number of girls passed = $\frac{1920 \times 1}{2} = 960$
 Total pass percentage = $\frac{1472 \times 100}{3200} = 46\%$
- 96. (d):** Total number of students in E = $\frac{4000}{25} \times 16 = 2560$
 Passed students in E = 2048
 Total number of students in B = 4000
 Total number of passed student in B = $2048 + 252 = 2300$
 Let total number of boys and girls are x and y respectively
 So
 $x + y = 4000 \dots(i)$
 and $\frac{50}{100}x + \frac{60}{100}y = 2300 \dots(ii)$
 Solving (i) and (ii)
 $x = 1000$
 $y = 3000$
 Number of boys passed in E = $\frac{1000 \times 50}{100} + 76 = 576$
 Number of girls passed in E = $2048 - 576 = 1472$
 Total number of boys in E = $\frac{576}{60} \times 100 = 960$
 Total number of girls in E = $2560 - 960 = 1600$
 % of girls passed in E = $\frac{1472}{1600} \times 100 = 92\%$
- 97. (b):** Let total boys in stream C = x
 So, passed boys in C = $\frac{4}{5}x$
 Total boys in stream E = $\frac{4x}{5} \times \frac{5}{3} = \frac{4}{3}x$
 Let girls in both streams = y
 In stream C
 $x + y = 2400 \dots(i)$
 In stream E
 $\frac{4}{3}x + y = 2560 \dots(ii)$
 From (i) and (ii)
 $\frac{1}{3}x = 160$
 $x = 480$
 $y = 1920$

Total number of girls passed in stream E or stream C = $2560 \times \frac{80}{100} - 384 = 1664$

Total number of girls failed in stream E or stream C = $1920 - 1664 = 256$

Required % = $\frac{256}{1920} \times 100 = 13\frac{1}{3}\%$

98. (b): Let Number of girls and boys in Aravali in 2012 be x and y respectively.

In 2013

Number of girls = $1.2x$

Change in girls = $0.2x$

Change in boys is = $\frac{0.2x}{125} \times 100 = 0.16x$

Total increment = $0.2x + 0.16x$

$0.36x = 270$

$x = \frac{270 \times 100}{36}$

$x = 750$

Number of boys in Aravali in 2013 = $\frac{2}{3} \times 1.2 \times 750 = 600$

99. (c): Let Number of Girls in Aravali be x.

Let Number of girls who left Aravali and joins Nilgiri is 'a'

Total strength of Aravali increases which means change in number of boys is = $270 + a$

Total strength of Nilgiri decreases, which means change in number of boys in Nilgiri is

= $250 + a$

$\frac{270+a}{250+a} = \frac{16}{15}$

$a = 50$

Number of boys increases in Nilgiri = $250 + 50 = 300$

100. (a): Let Number of boys in Udaygiri in Shivalik in 2012 = x

Let Number of Girls in Udaygiri in 2012 = y

So, Number of Girls in Shivalik = $y + 540$

In 2013,

Let Number of boys in Udaygiri and Shivalik = $20a$

\Rightarrow Number of Girls in Shivalik = $35a$

And, Number of Girls in Udaygiri = $12a$

ATQ

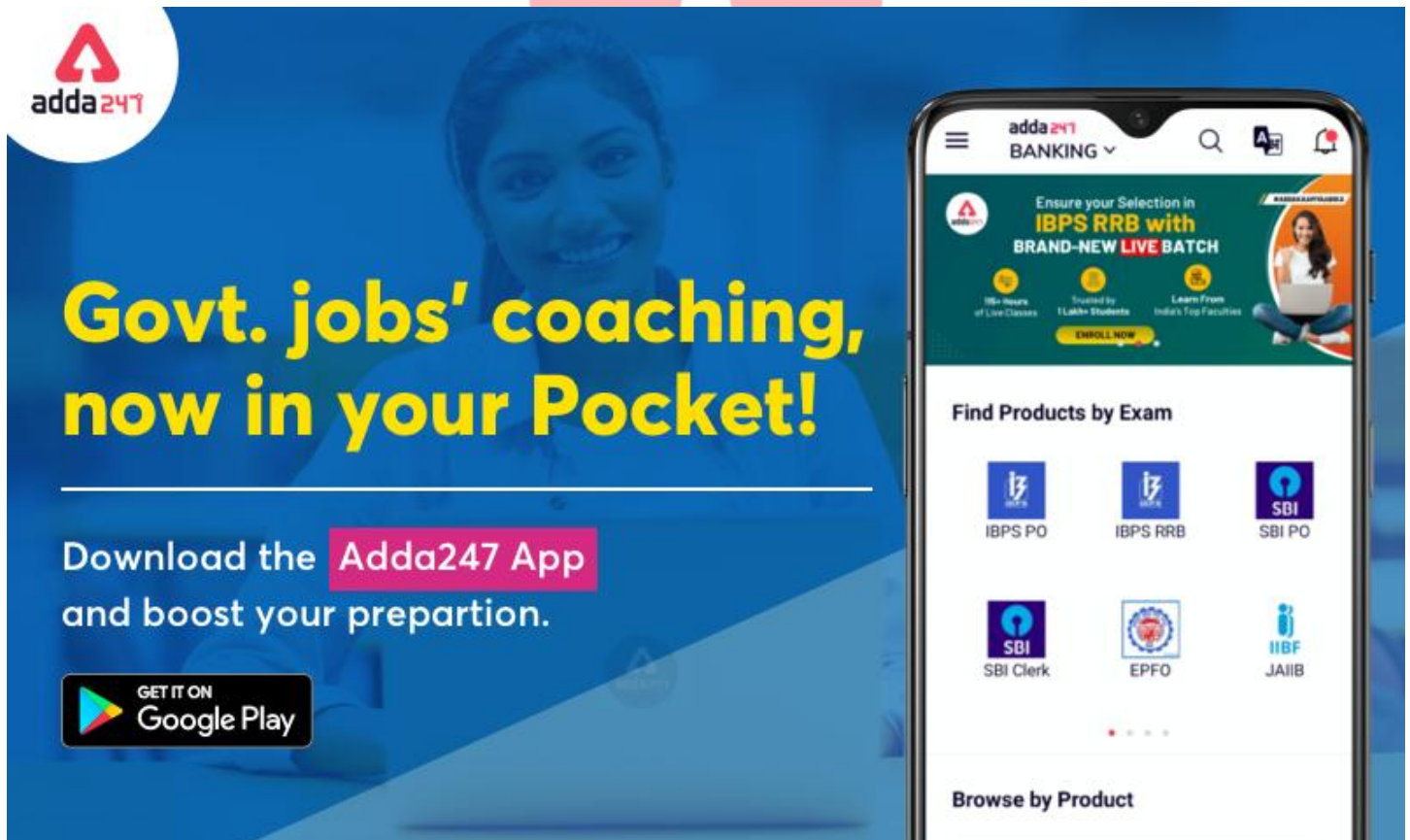
$x + y + 150 = 32a \dots(i)$

$x + (y + 540) + 300 = 55a \dots(ii)$

Solving (i) and (ii)

$a = 30$

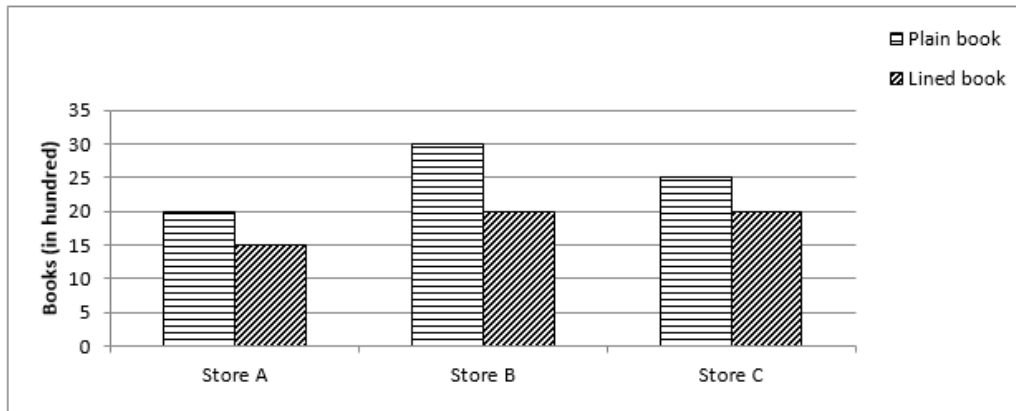
Shivalik strength = $55a = 55 \times 30 = 1650$



The advertisement features a blue background with a woman's face. On the left, the Adda247 logo is shown above the text "Govt. jobs' coaching, now in your Pocket!". Below this, it says "Download the Adda247 App and boost your preparation." with a "GET IT ON Google Play" button. On the right, a smartphone displays the app's interface, which includes a banner for "IBPS RRB with BRAND-NEW LIVE BATCH", a section titled "Find Products by Exam" with icons for IBPS PO, IBPS RRB, SBI PO, SBI Clerk, EPFO, and IIBF JAIIB, and a "Browse by Product" section at the bottom.

Previous Years' Questions of Prelims

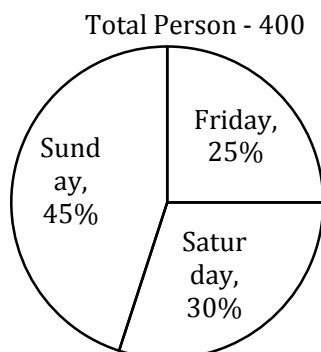
Directions (1-5): Given bar graph shows the number of plain books and lined books (in hundreds) available at three different stores and the table shows the percentage of total books (Plain + lined) that was sold by different stores.



Stores	% of sold books
A	20%
B	40%
C	30%

- The number of plain books sold by store A and store B was 30% and 40% respectively then find number of lined books sold by store A and store B together is what percent of total books available at store A ?
 (a) $22\frac{6}{7}\%$ (b) $23\frac{4}{7}\%$ (c) $25\frac{5}{7}\%$ (d) 25% (e) None of these
- Average of total books sold by stores B and C together is how much more than total unsold books of store A.
 (a) 1125 (b) 1075 (c) 1055 (d) 1175 (e) 1225
- Ratio of sold plain and lined books for store C is 5 : 4 and for store B is 3 : 2. Then find the total plain books sold by these two stores together ?
 (a) 1750 (b) 1825 (c) 1850 (d) 1950 (e) 1975
- Unsold books of store A is approximately is what percent more or less than total unsold books of store B and C together.
 (a) 48% (b) 54% (c) 59% (d) 52% (e) 57%
- Selling price of each plain books and lined books sold by store B is Rs. 250 and Rs. 175 respectively. Then, find the total amount earned by store B on selling these books if 60% of lined books are sold by the store?
 (a) Rs. 2.5 lac (b) Rs. 3.6 lac (c) 3.5 lac (d) 3.8 lac (e) 4.1 lac

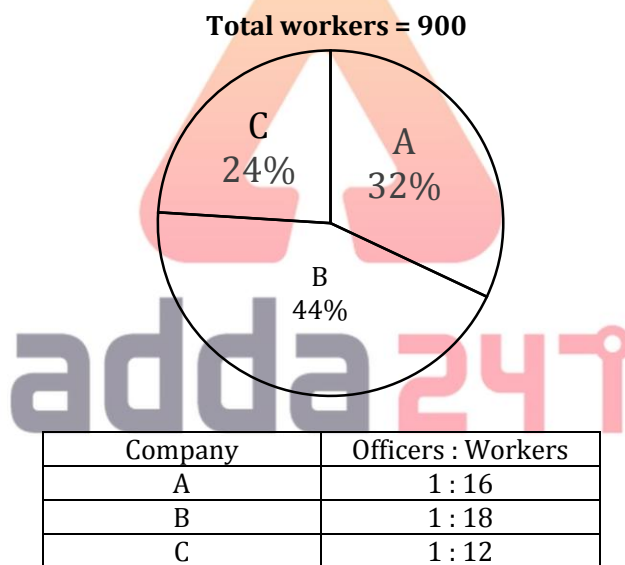
Direction (6-10): Given below is the pie chart which shows the number of persons visiting a national park on different days and table shows the ratio of male to female visiting these parks.



Days	Male : Female
Friday	2 : 3
Saturday	5 : 7
Sunday	5 : 4

6. If on Monday number of males who visited national park are increased by 20% over males visiting national park on Saturday and Females visiting national park on Monday is $33\frac{1}{3}\%$ more than females visiting on Friday then, find the total persons visiting national park on Monday.
 (a) 145 (b) 165 (c) 140 (d) 160 (e) 150
7. Total females visiting national park on Sunday and Saturday together are what percent more or less than total male visiting national park on Friday and Sunday together.
 (a) $33\frac{1}{3}\%$ (b) $14\frac{2}{7}\%$ (c) $16\frac{2}{3}\%$ (d) $14\frac{1}{7}\%$ (e) $7\frac{1}{7}\%$
8. What is the average of males visiting national park on all these days
 (a) $63\frac{1}{3}$ (b) $65\frac{2}{3}$ (c) $49\frac{2}{3}$ (d) $45\frac{1}{3}$ (e) $66\frac{2}{3}$
9. If cost of ticket per male and per female on any day is Rs 45 and Rs 40 respectively then total amount obtained by national park on Friday is how much more or less than total amount obtained by national park on Sunday (in Rs).
 (a) 2800 (b) 3500 (c) 3000 (d) 3200 (e) 4200
10. What is the ratio of males visiting park on Friday to females visiting park on Saturday.
 (a) 4 : 5 (b) 7 : 3 (c) 3 : 7 (d) 4 : 7 (e) 7 : 4

Direction (11-15): Pie chart given below shows total number of workers in three different companies. Table given below shows ratio between officers and workers working in these companies. Study the data carefully and answer the following questions

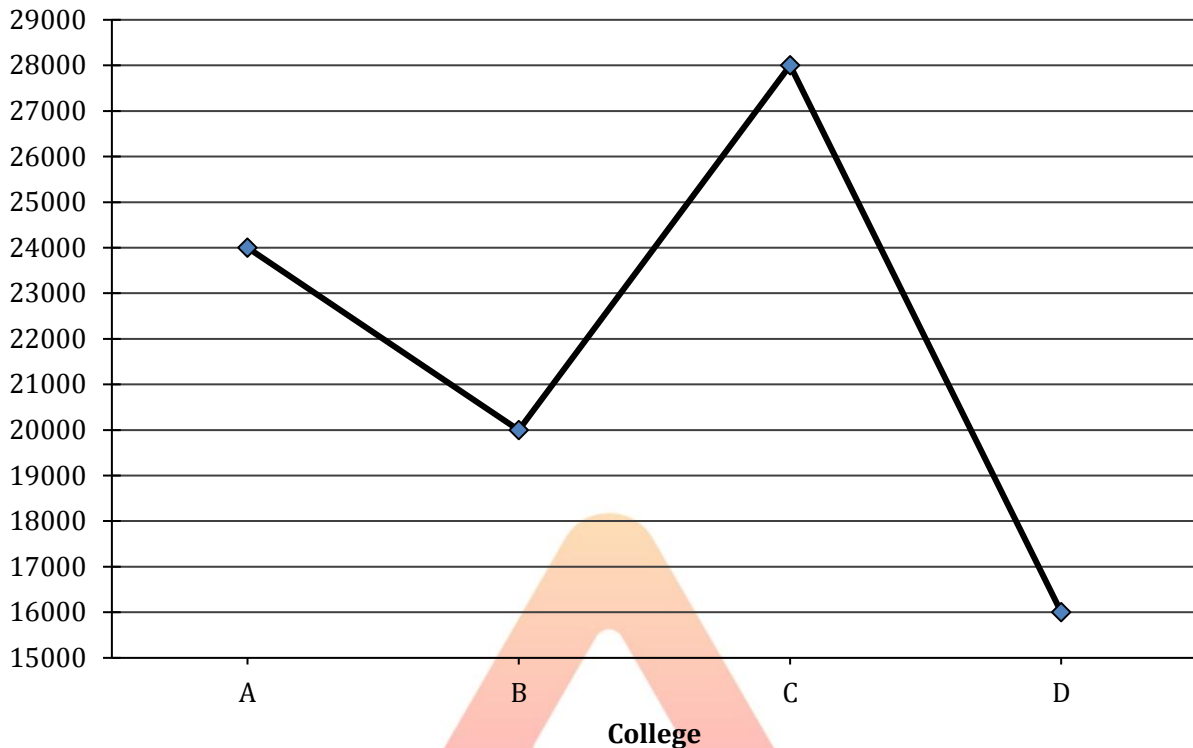


Note: - Total employees = Officers + Workers

11. Find the ratio between total number of workers in company A and C together to total number of officers in company A and C together?
 (a) 16 : 1 (b) 12 : 1 (c) 14 : 1 (d) 18 : 1 (e) 20 : 1
12. Total number of employees in company 'B' is how much more than total number of employees in company 'C'.
 (a) 174 (b) 194 (c) 204 (d) 214 (e) 184
13. Total number of officers in company 'A' is how much less than total number of officers in company 'B'?
 (a) 4 (b) 2 (c) 0 (d) 6 (e) 8
14. Total number of officers and workers in company D is 50% and 25% more than total number of officers and workers in company 'C' respectively. Find total number of employees in company 'D'?
 (a) 279 (b) 297 (c) 342 (d) 324 (e) 306
15. Find the difference between total number of workers in company 'A' and total number of workers in company 'B' and 'C' together?
 (a) 432 (b) 396 (c) 360 (d) 324 (e) 288

Directions (16-20): The given line graph shows the number of total applications applied for the post of professor in four colleges.

The table shows the percentage of rejected application by colleges.

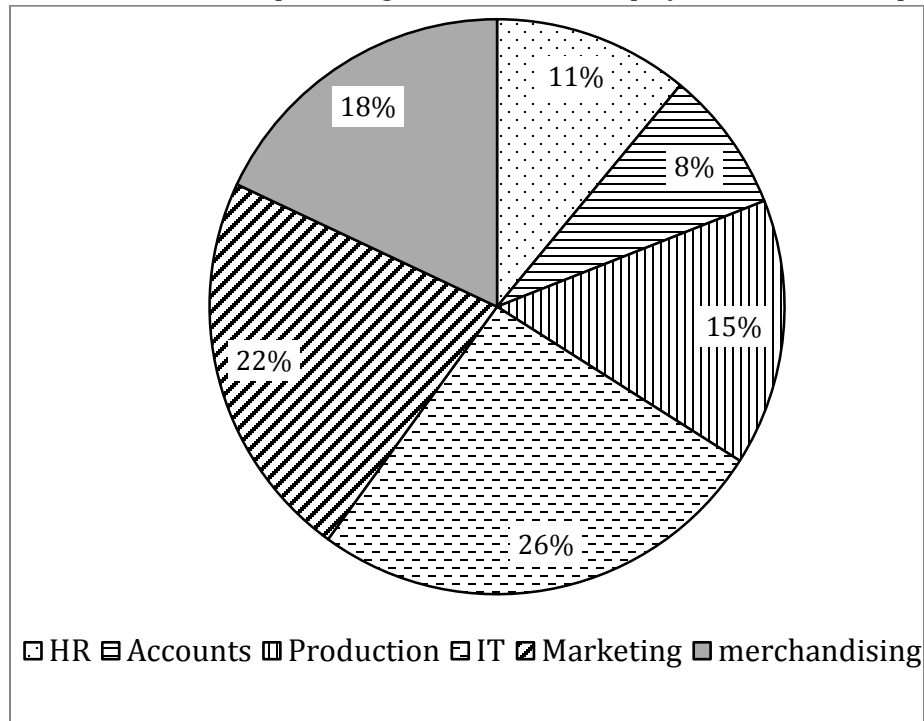


College	Percentage of rejected application
A	25%
B	16%
C	15%
D	$6\frac{1}{4}\%$

- 16.** In accepted application by college A $33\frac{1}{3}\%$ are applied by females. Then accepted application applied by male in college A is what percent of total accepted application by college D.
 (a) 75% (b) 70% (c) 120% (d) 60% (e) 80%
- 17.** Find the average number of accepted applications by all these 4 colleges.
 (a) 19,350 (b) 18,400 (c) 18,840 (d) 20,050 (e) 17,900
- 18.** Among accepted application by college B and C the ratio of male to female applicant are 10 : 11 and 8 : 9 respectively. Then find the ratio of accepted application applied by female in college B to accepted application applied by male in college C.
 (a) 12 : 13 (b) 27 : 29 (c) 15 : 11 (d) 9 : 17 (e) 11 : 14
- 19.** Rejected application by college C is what percent of rejected application by college B and D together.
 (a) 100% (b) 80% (c) 124% (d) 72% (e) 125%
- 20.** Find difference of rejected application by college B and college D.
 (a) 1560 (b) 2200 (c) 2016 (d) 2370 (e) 2400

Directions (21–25) : Study the pie chart and table carefully and answer the following questions.

Given below is the pie chart which shows the percentage distribution of employees in different departments

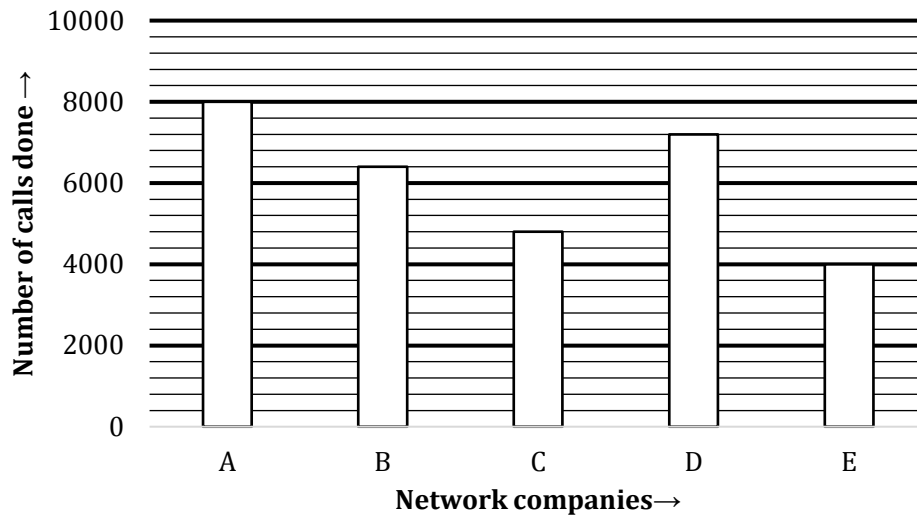


Total no. of employees = 4600

Department	Men : Women
HR	1 : 1
Accounts	3 : 1
Production	3:2
IT	1 : 3
Marketing	1 : 1
Merchandising	5 : 1

21. Total females working in HR department are how much more or less than total males working in Marketing department?
 (a) 253 (b) 235 (c) 258 (d) 287 (e) None of these
22. Find the average no. of females working in HR, accounts and production department?
 (a) 217 (b) 270 (c) 207 (d) 214 (e) None of these
23. In which department the difference between no. of male employees and female employees is 2nd minimum?
 (a) Accounts (b) Production (c) IT (d) Merchandising (e) None of these
24. Find the total number of men working in the organization.
 (a) 2082 (b) 2182 (c) 2282 (d) 2438 (e) None of these
25. The difference between the total males and total females working in the organization is what percent of the sum of the same?
 (a) 4% (b) 5% (c) 5.5% (d) 6% (e) None of these

Direction (26-30): - Bar chart given below shows total number of call done by Five network companies and table shows that percentage of failed calls out of total calls done by respective network companies.

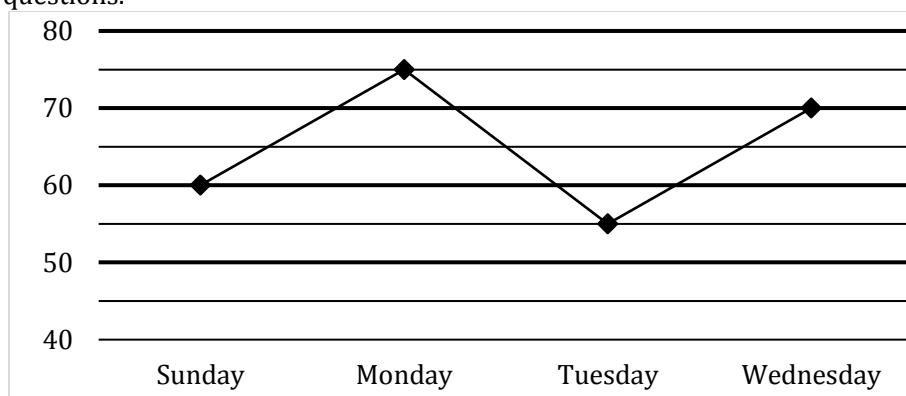


Network Companies	Percentage of failed calls
A	20
B	15
C	10
D	30
E	25

Total calls = Success calls + Failed calls

26. Find the total number of success calls of Network A, C and E together?
 (a) 12,360 (b) 14,800 (c) 14,840 (d) 16,160 (e) 13,720
27. Find the average number of failed calls of network B, C and D together?
 (a) 1200 (b) 1250 (c) 1300 (d) 1350 (e) 1400
28. Find the ratio between total number of success calls of network D to total number of failed calls of network B and C together?
 (a) 2 : 7 (b) 7 : 2 (c) 3 : 5 (d) 5 : 3 (e) 7 : 3
29. Total number of success calls of network C is what percent more than Total number of failed calls of network D?
 (a) 200% (b) 120% (c) 150% (d) 100% (e) 250%
30. Find the difference between least failed calls to highest failed calls for all five network companies?
 (a) 1200 (b) 1120 (c) 1680 (d) 1160 (e) 560

Direction (31-35): - Line graph given below shows total number of people (male+female) went to watch movies on four different days. Table given below shows number of male went to watch movies on these days. Study the data carefully and answer the following questions.

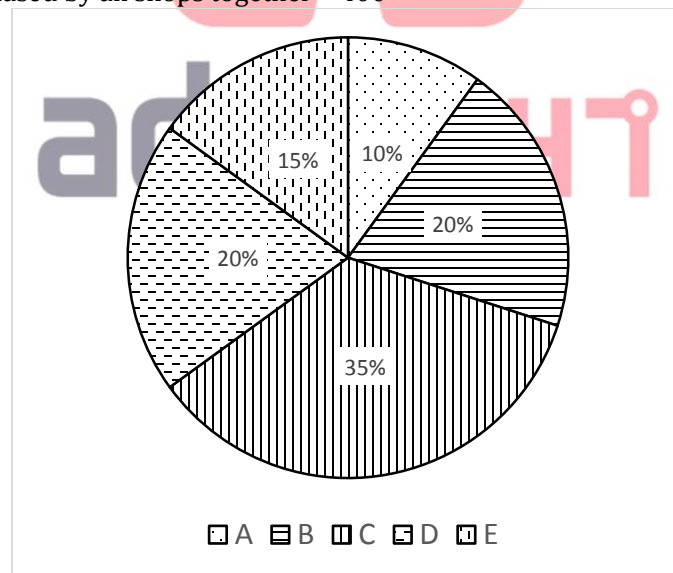


Days	Number of male went to watch movie
Sunday	16
Monday	24
Tuesday	23
Wednesday	37

31. Total number of male went to watch movie on Monday and Wednesday together is how much more than total number of female went to watch movie on Sunday?
 (a) 13 (b) 15 (c) 17 (d) 19 (e) 21
32. Number of female went to watch movie on Monday is what percent of total number of people went to watch movie on Monday?
 (a) 32% (b) 56% (c) 60% (d) 64% (e) 68%
33. Total number of people went to watch movie on Sunday and Monday together is how much more/less than total number of people went to watch movie on Tuesday and Wednesday together?
 (a) 10 (b) 20 (c) 30 (d) 40 (e) 50
34. Find the average number of female went to watch movie on Monday and Wednesday together?
 (a) 38 (b) 40 (c) 42 (d) 46 (e) 44
35. Total number of female went to watch movie on all days together is how much more than total number of male went to watch movie on all days together?
 (a) 160 (b) 60 (c) 120 (d) 80 (e) 40

Direction (36 – 41): Given below pie chart shows percentage distribution of total orders of ice cream purchased by five different shops and table shows percentage of orders of ice cream sold by these five shops. Read the data carefully and answer the questions.

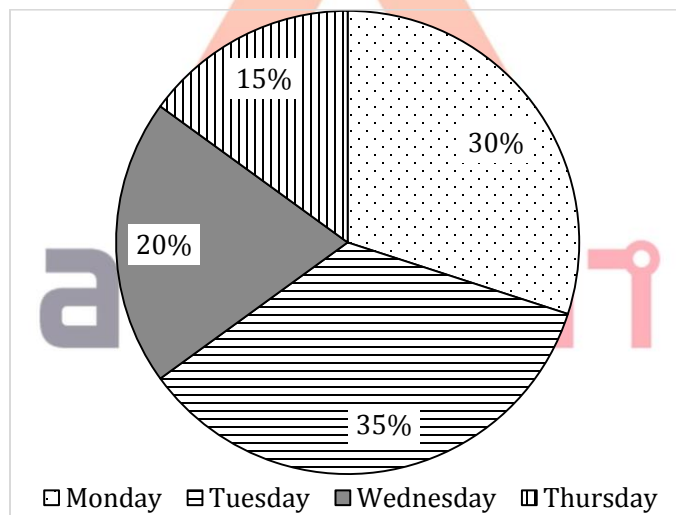
Total orders of ice cream purchased by all shops together = 400



Shops	Percentage of order of ice cream sold out of total order purchased
A	60%
B	75%
C	80%
D	95%
E	90%

36. Total unsold order of ice cream by shop E is what percent more than total unsold order of ice cream by shop D?
 (a) 30% (b) 50% (c) 40% (d) 20% (e) 60%
37. Out of total order of ice cream sold by shop B, 25% are chocolate, 15% are vanilla and rest are strawberry. If $33\frac{1}{3}\%$ & 75% of total order of chocolate and vanilla were sold, then find the total orders of strawberry purchased by B?
 (a) 19 (b) 27 (c) 29 (d) 23 (e) 21
38. The cost price of each order purchased by shop D is Rs. 200. If shop D sold 25% order at Rs. 175 each and rest at Rs. 250 each. Find the overall profit (approximate) of shop D?
 (a) 25% (b) 5% (c) 15% (d) 10% (e) 20%
39. Find average number of unsold orders of ice cream for A, B & E?
 (a) 14 (b) 12 (c) 16 (d) 18 (e) 22
40. If total orders of ice cream purchased by shop X is 25% more than that of B and total unsold orders of ice cream by shop X is equal to difference between total unsold orders of ice cream by shop C & D, then find total sold orders of ice cream by shop X?
 (a) 76 (b) 78 (c) 72 (d) 70 (e) 64
41. Find the central angle for total orders of ice cream purchased by C?
 (a) 96° (b) 102° (c) 112° (d) 108° (e) 126°

Directions (42-46) Pie chart given below gives percentage distribution of people who visited in park in four days of week (Monday to Thursday) out of total 1200 people, and table given below gives information of no. of female who visited in these four days.



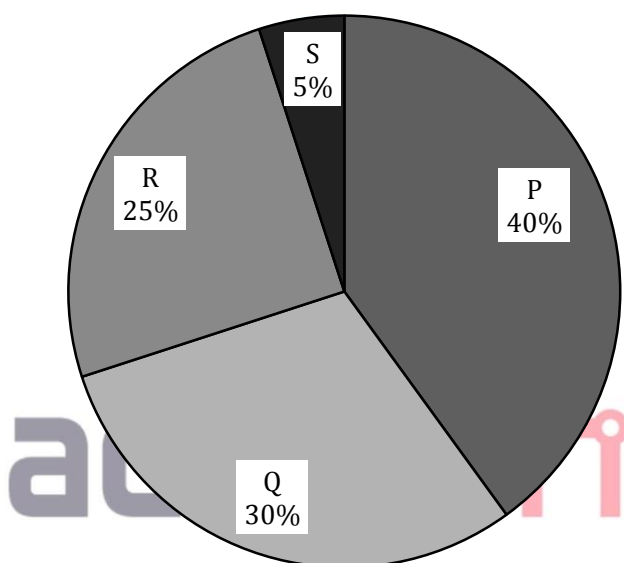
Day	No. of female visited
Monday	144
Tuesday	314
Wednesday	96
Thursday	128

42. No. of male who visited park on Wednesday are what percent of total people visited on that day?
 (a) 40% (b) 45% (c) 60% (d) 20% (e) 25%
43. What is the ratio of no. of male who visited on Monday to no. of female who visited on Thursday?
 (a) 27:16 (b) 3:2 (c) 7:4 (d) 25:18 (e) None of these.
44. Total females are how much more or less than total no. of male who visited in park on these 4 days?
 (a) 172 (b) 164 (c) 188 (d) 194 (e) 178

45. Total no. of male who visited park on Wednesday are what percent of total no. of people visited on Monday?
 (a) 20% (b) 25% (c) 37.5% (d) 40% (e) 44.44%
46. If 25% of male who visited on Monday is equal to number of males who visited the park on Friday, then what was the ratio of no. of males visited on Tuesday to that of on Friday?
 (a) 2:1 (b) 5:4 (c) 3:2 (d) 5:6 (e) None of the above.

Direction (47 – 50): Given below table shows total number of employees in five different companies (A, B, C, D & E) and percentage of male employee. The pie chart shows percentage distribution of female employee in four different department of company A. Read the data carefully and answer the questions.

Company	Total employee	Percentage of male employee
A	600	50%
B	800	60%
C	750	40%
D	900	80%
E	1000	75%



Note – There is only four departments in all the five companies.

47. If ratio between total female employee in department R of company A & E is 3 : 2, then find total females in departments P, Q, & S together of company E is what percent of total male employee in C?
 (a) $33\frac{1}{3}\%$ (b) $66\frac{2}{3}\%$ (c) $166\frac{2}{3}\%$ (d) $67\frac{1}{2}\%$ (e) $87\frac{1}{2}\%$
48. If total males are in department S of company D is 39 more than that female in same department of A, then find difference between total males in departments P, Q & R of company D together and total female in company B?
 (a) 346 (b) 356 (c) 368 (d) 372 (e) 387
49. Total female in department Q of company C is approximate what percent of total male in A, D & E together. If total female in department Q of company C are 40 more than total female in department P & Q together of company A?
 (a) 8% (b) 27% (c) 36% (d) 14% (e) 48%
50. Find ratio of average number of female employees in A, C & D together to total male employee in E?
 (a) 31 : 78 (b) 31 : 75 (c) 31 : 96 (d) 31 : 108 (e) 31 : 65

Previous Years' Solutions of Mains

1. (c): Total books sold by store A = $3500 \times \frac{20}{100} = 700$

Total plain books sold by store A

$$= 2000 \times \frac{30}{100} = 600$$

$$\text{Total lined books sold by store A} = 700 - 600 = 100$$

$$\text{Total books sold by store B} = 5000 \times \frac{40}{100} = 2000$$

$$\text{Plain books sold by store B} = 3000 \times \frac{40}{100} = 1200$$

$$\text{Total lined books sold by store B} = 2000 - 1200 = 800$$

$$\text{Required \%} = \frac{900}{3500} \times 100 = \frac{180}{7} \% = 25\frac{5}{7} \%$$

2. (a): Average of total books sold by stores B and C

$$= \frac{1}{2} \left(50 \times \frac{40}{100} \times 100 + 45 \times \frac{30}{100} \times 100 \right)$$

$$= 1675$$

$$\text{Unsold books of store A} = 3500 \times \frac{80}{100} = 2800$$

$$\text{Required difference} = 2800 - 1675 = 1125$$

3. (d): Total book sold by store C = $45 \times 100 \times \frac{300}{100} = 1350$

$$\text{Plain books sold by C} = 1350 \times \frac{5}{9} = 750$$

$$\text{Plain books sold by store B} = \frac{3}{5} \times 5000 \times \frac{40}{100} = 1200$$

$$\text{Required number of books} = 1200 + 750 = 1950$$

4. (b): Unsold books of store A = $3500 \times \frac{80}{100} = 2800$

Unsold books of store B and C together

$$= 5000 \times \frac{60}{100} + 4500 \times \frac{70}{100}$$

$$= 6150$$

$$\text{Required \%} = \frac{6150 - 2800}{6150} \times 100 = 54\%$$

5. (e): Number of total books sold by store B

$$= 5000 \times \frac{40}{100} = 2000$$

Number of lined books sold

$$= 2000 \times \frac{60}{100} = 1200$$

Total amount earned

$$= \text{Rs. } (800 \times 250 + 1200 \times 175) = \text{Rs. } 4.1 \text{ lac}$$

6. (c): Total Males visiting national park on Monday

$$= \frac{30}{100} \times 400 \times \frac{5}{12} \times \frac{120}{100}$$

$$= 120 \times \frac{5}{12} \times \frac{6}{5}$$

$$= 60$$

Total females visiting national park on Monday =

$$\frac{25}{100} \times 400 \times \frac{3}{5} \times \frac{4}{3}$$

$$= 80$$

$$\text{Required sum} = 80 + 60 = 140$$

7. (e): Total female visiting national park on Sunday and

$$\text{Saturday together} = \frac{30}{100} \times 400 \times \frac{7}{12} + \frac{45}{100} \times$$

$$400 \times \frac{4}{9}$$

$$= 70 + 80$$

$$= 150$$

Total male visiting national park on Friday and

$$\text{Sunday together} = \frac{25}{100} \times 400 \times \frac{2}{5} + \frac{45}{100} \times 400 \times \frac{5}{9}$$

$$= 40 + 100 = 140$$

$$\text{Required percentage} = \frac{150 - 140}{140} \times 100$$

$$= 7\frac{1}{7} \%$$

8. (a): Required average = $\frac{40 + 50 + 100}{3}$

$$= \frac{190}{3}$$

$$= 63\frac{1}{3}$$

9. (b): Total amount obtained on Friday = $40 \times 45 + 60 \times 40$

$$= 1800 + 2400$$

$$= \text{Rs } 4200$$

Total amount obtained on Sunday = $100 \times 45 +$

$$40 \times 80$$

$$= 4500 + 3200$$

$$= 7700$$

$$\text{Required difference} = 7700 - 4200$$

$$= \text{Rs } 3500$$

10. (d): Required ratio = $40 : 70$

$$= 4 : 7$$

11. (c): Total number of workers in company A and C together

$$= 900 \times \frac{32}{100} + 900 \times \frac{24}{100}$$

$$= 288 + 216 = 504$$

Total number of officers in company A and C together

$$= 900 \times \frac{32}{100} \times \frac{1}{16} + 900 \times \frac{24}{100} \times \frac{1}{12}$$

$$= 18 + 18 = 36$$

$$\text{Required Ratio} = \frac{504}{36} = \frac{14}{1}$$

12. (e): Total number of employees in company B

$$= 900 \times \frac{44}{100} \times \frac{19}{18} = 418$$

Total number of employees in company C

$$= 900 \times \frac{24}{100} \times \frac{13}{12} = 234$$

$$\text{Required difference} = 418 - 234 = 184$$

13. (a): Total number of officers in Company 'A'

$$= 900 \times \frac{32}{100} \times \frac{1}{16} = 18$$

Total number of officers in Company 'B'

$$= 900 \times \frac{44}{100} \times \frac{1}{18} = 22$$

$$\text{Required difference} = 22 - 18 = 4$$

14. (b): Total number of officers in company C

$$= 900 \times \frac{24}{100} \times \frac{1}{12} = 18$$

Total number of workers in company C

$$= 900 \times \frac{24}{100} = 216$$

Total number of employees in company D

$$= 216 \times 1.25 + 18 \times 1.5 = 270 + 27 = 297$$

15. (d): Required difference = $\frac{900}{100} \times (44 + 24 - 32) =$

$$9 \times 36 = 324$$

16. (e): Total applied application in college A = 24,000

So total accepted application of college A

$$= 24,000 - 24,000 \times \frac{25}{100}$$

$$= 18,000$$

Accepted application applied by male in college A

$$= 18,000 - 33\frac{1}{3}\% \text{ of } 18,000$$

$$= 12,000$$

Total applied application in college D = 16,000

Total accepted application by college D

$$= 16,000 - 6\frac{1}{4}\% \text{ of } 16,000$$

$$= 15,000$$

$$\text{Required percent} = \frac{12,000}{15,000} \times 100 = 80\%$$

17. (b): Total accepted application by college A =

$$24,000 - 24,000 \times \frac{25}{100} = 18,000$$

Total accepted application by college B =

$$20,000 - 20,000 \times \frac{16}{100} = 16,800$$

Total accepted application by college C =

$$28,000 - 28,000 \times \frac{15}{100} = 23,800$$

Total accepted application by college D = 16,000

$$- 6\frac{1}{4}\% \text{ of } 16,000 = 15,000$$

Required average

$$= \frac{18,000 + 16,800 + 23,800 + 15,000}{4} = 18,400$$

18. (e): Total accepted application by college B

$$= 20,000 - 20,000 \times \frac{16}{100} = 16,800$$

Female applicant in accepted application in

$$\text{college B} = 16,800 \times \frac{11}{21} = 8,000$$

Total accepted application by college C

$$= 28,000 - 28,000 \times \frac{15}{100} = 23,800$$

Male applicant in accepted application in college

$$\text{C} = 23,800 \times \frac{8}{17} = 11,200$$

$$\text{Required ratio} = \frac{8,000}{11,200} = 11 : 14$$

$$\begin{aligned} \text{19. (a): Required percentage} &= \frac{28,000 \times \frac{15}{100}}{\left(20,000 \times \frac{16}{100} + 16,000 \times \frac{25}{4} \times \frac{1}{100}\right)} \\ &= \frac{4,200}{(3,200 + 1,000)} \times 100 \\ &= 100\% \end{aligned}$$

$$\begin{aligned} \text{20. (b): Required difference} &= 20,000 \times \frac{16}{100} - 16,000 \times \\ &\frac{25}{4} \times \frac{1}{100} = 2,200 \end{aligned}$$

81. (c): Total letter in IMPORTANCE → 10

Total letter in PORTABILITY → 11

Letters which is common in both words ⇒

I P O R T A

So we choose a letter rather than these six letters

$$\Rightarrow \frac{4}{10} = \frac{2}{5}$$

$$\text{21. (a): Females in HR} = \frac{1}{2} \times 11 \times 46 = 253$$

$$\text{Males in Marketing} = \frac{1}{2} \times 22 \times 46 = 506$$

$$\text{Required difference} = 506 - 253 = 253$$

$$\begin{aligned} \text{22. (c): Required average} &= \frac{253 + \frac{1}{4} \times 8 \times 46 + \frac{2}{5} \times 15 \times 46}{3} = \\ &\frac{1}{3} \times 621 = 207 \end{aligned}$$

23. (b): Difference between male and female employees in

HR = 0

$$\text{Accounts} = \frac{2}{4} \times 8 \times 46 = 184$$

$$\text{Production} = \frac{1}{5} \times 15 \times 46 = 138$$

$$\text{IT} = \frac{2}{4} \times 26 \times 46 = 598$$

Marketing = 0

$$\text{Merchandising} = \frac{4}{6} \times 18 \times 46 = 552$$

So, difference is 2nd minimum for production department.

$$\begin{aligned} \text{24. (d): Total number of men} &= 253 + \frac{3}{4} \times 8 \times 46 + \\ &\frac{3}{5} \times 15 \times 46 + \frac{1}{4} \times 26 \times 46 + 506 + \frac{5}{6} \times 18 \times 46 \\ &= 253 + 276 + 414 + 299 + 506 + 690 \\ &= 2,438 \end{aligned}$$

$$\text{25. (d): Required percentage} = \frac{(2,438 - 2,162)}{4,600} \times 100 = 6\%$$

$$\begin{aligned} \text{26. (e): Total number of success calls of Network A} &= \\ &8,000 \times \frac{80}{100} = 6,400 \end{aligned}$$

Total number of success calls of Network C =

$$4,800 \times \frac{90}{100} = 4,320$$

Total number of success calls of Network E =

$$4,000 \times \frac{75}{100} = 3,000$$

Total number of success calls of Network A, C and

$$\text{E together} = 6,400 + 4,320 + 3,000 = 13,720$$

- 27. (a):** Total number of failed calls of Network B = $6400 \times \frac{15}{100} = 960$
 Total number of failed calls of Network C = $4800 \times \frac{10}{100} = 480$
 Total number of failed calls of Network D = $7200 \times \frac{30}{100} = 2160$
 Required average = $\frac{960+480+2160}{3} = 1200$
- 28. (b):** Total number of success calls of Network D = $7200 \times \frac{70}{100} = 5040$
 Total number of failed calls of Network B = $6400 \times \frac{15}{100} = 960$
 Total number of failed calls of Network C = $4800 \times \frac{10}{100} = 480$
 Required ratio = $\frac{5040}{960+480} = \frac{5040}{1440} = \frac{7}{2}$
- 29. (d):** Total number of success calls of Network C = $4800 \times \frac{90}{100} = 4320$
 Total number of failed calls of Network D = $7200 \times \frac{30}{100} = 2160$
 Required % = $\frac{4320-2160}{2160} \times 100 = 100\%$
- 30. (c):** Total number of failed calls of Network A = $8000 \times \frac{20}{100} = 1600$
 Total number of failed calls of Network B = $6400 \times \frac{15}{100} = 960$
 Total number of failed calls of Network C = $4800 \times \frac{10}{100} = 480$
 Total number of failed calls of Network D = $7200 \times \frac{30}{100} = 2160$
 Total number of failed calls of Network E = $4000 \times \frac{25}{100} = 1000$
 Required difference = $2160 - 480 = 1680$
- 31. (c):** Total number of male went to watch movie on Monday and Wednesday together = $24 + 37 = 61$
 Total number of female went to watch movie on Sunday = $60 - 16 = 44$
 Required difference = $61 - 44 = 17$
- 32. (e):** Required % = $\frac{75-24}{75} \times 100 = \frac{51}{75} \times 100 = 68\%$
- 33. (a):** Required difference = $(60 + 75 - 55 - 70) = 135 - 125 = 10$
- 34. (c):** Required average = $\frac{(75-24)+(70-37)}{2} = \frac{51+33}{2} = 42$
- 35. (b):** Total number of male went to watch movie on all days together = $16 + 24 + 23 + 37 = 100$

Total number of female went to watch movie on all days together = $(60 + 75 + 55 + 70) - 100 = 260 - 100 = 160$
 Required difference = $160 - 100 = 60$

- 36. (b):** Total unsold order of ice cream by shop E = $400 \times \frac{15}{100} \times \frac{10}{100} = 6$

Total unsold order of ice cream by shop D = $400 \times \frac{20}{100} \times \frac{5}{100} = 4$

Required percentage = $\frac{6-4}{4} \times 100 = 50\%$

- 37. (d):** Total orders purchased by B = $400 \times \frac{20}{100} = 80$

Total order sold by B = $400 \times \frac{20}{100} \times \frac{75}{100} = 60$

Total order of chocolate ice cream purchased by B = $60 \times \frac{25}{100} \times \frac{3}{1} = 45$

Total order of vanilla ice cream purchased by B = $60 \times \frac{15}{100} \times \frac{100}{75} = 12$

So, total orders of strawberry purchased by B = $80 - (45 + 12) = 23$

- 38. (d)**

Total cost for shop D = $400 \times \frac{20}{100} \times 200 = 16000$ Rs.

Total sold by shop D = 95 % of 20% of 400 = 76

Total selling price = $175 * (25\% \text{ of } 76) + 250$

$*(75\% \text{ of } 76) = 175 * 19 + 250 * 57 =$

$3325 + 14250 = 17575$

Profit % = $\frac{(17575 - 16000)}{16000} \times 100 \approx 10\%$

- 39. (a):** Unsold orders of ice cream for A = $400 \times \frac{10}{100} \times \frac{40}{100} = 16$

Unsold orders of ice cream for B = $400 \times \frac{20}{100} \times \frac{25}{100} = 20$

Unsold orders of ice cream for E = $400 \times \frac{15}{100} \times \frac{10}{100} = 6$

Required average = $\frac{16+20+6}{3} = 14$

- 40. (a):** Total orders of ice cream purchased by shop X = $400 \times \frac{20}{100} \times \frac{125}{100} = 100$

Total unsold orders of ice cream by shop X = $400 \times \frac{35}{100} \times \frac{20}{100} - 400 \times \frac{20}{100} \times \frac{5}{100} = 24$

So, total sold orders of ice cream by shop X = $100 - 24 = 76$

- 41. (e):** Required central angle = $\frac{35}{100} \times 360^\circ = 126^\circ$

- 42. (c):** no. of people who visited on Wednesday = $1200 \times \frac{20}{100} = 240$

Required percentage = $\frac{240-96}{240} \times 100 = 60\%$

43. (a): no. of male visited on Monday = $1200 \times \frac{30}{100} - 144 = 216$
 Required ratio = 216: 128
 = 27: 16

44. (b): total no. of female who visited park = $144 + 314 + 96 + 128 = 682$
 Total no. of males who visited park = $1200 - 682 = 518$
 Required difference = $682 - 518 = 164$

45. (d): total no. of male visited on Wednesday = $1200 \times \frac{20}{100} - 96 = 144$
 Total no. of people who visited on Monday = $1200 \times \frac{30}{100} = 360$
 Required percentage = $\frac{144}{360} \times 100 = 40\%$

46. (e): no. of male who visited on Tuesday = $1200 \times \frac{35}{100} - 314 = 106$
 No. of male who visited on Friday = $\frac{25}{100} \left[1200 \times \frac{30}{100} - 144 \right] = 54$
 Required ratio = 106: 54
 = 53:27

47. (b): Total female employee in department R of company E = $600 \times \frac{50}{100} \times \frac{25}{100} \times \frac{2}{3} = 50$
 Total female employee of departments P, Q, & S of company E = $1000 \times \frac{25}{100} - 50 = 200$

Total male employee in C = $750 \times \frac{40}{100} = 300$
 Required percentage = $\frac{200}{300} \times 100 = 66\frac{2}{3}\%$

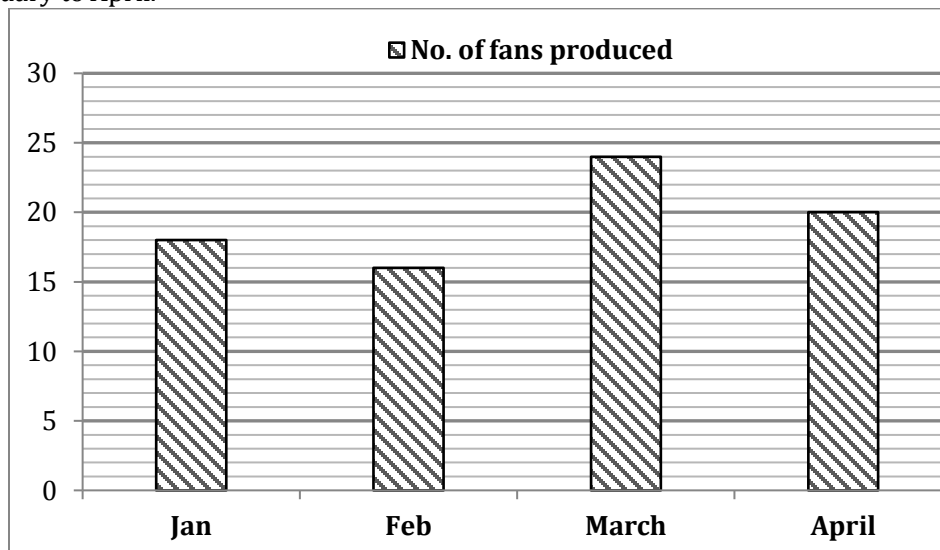
48. (a): Total male are in department S of company D = $600 \times \frac{50}{100} \times \frac{5}{100} + 39 = 54$
 Males in departments P, Q & R of company D = $900 \times \frac{80}{100} - 54 = 666$
 Required difference = $666 - 800 \times \frac{40}{100} = 346$

49. (d): Total female in department Q of company A = $600 \times \frac{50}{100} \times \frac{(40+30)}{100} = 250$
 Total male in A, D & E = $600 \times \frac{50}{100} + 900 \times \frac{80}{100} + 1000 \times \frac{75}{100}$
 = $300 + 720 + 750$
 = 1770
 Required percentage = $\frac{250}{1770} \times 100$
 = $14.12 \approx 14\%$

50. (b): Average number of female employees in A, C & D
 = $\frac{600 \times \frac{50}{100} + 750 \times \frac{60}{100} + 900 \times \frac{20}{100}}{3}$
 = $\frac{300 + 450 + 180}{3}$
 = $\frac{930}{3} = 310$
 Required ratio = $\frac{310}{1000 \times \frac{75}{100}}$
 = $\frac{310}{750} = 31 : 75$

Previous Years' Questions of Mains

Directions (1-4): Bar graph shows the number of fans produced (in hundreds) by a manufacturer in the period of four months i.e. from January to April.



Shopkeeper has to decide whether to test or not all the units of fans before sending them to the customer. If he has decided to test, he has two options.

(a) Option I

(b) Option II

Option I :- It cost Rs 2.50 per unit as testing cost but this method of testing allows 30% of defective fans to pass to the customer.

Option II :- It cost Rs 4 per unit as testing cost and it find 90% of defective units

→ All defective units identified at the customer end, will causes a penalty of Rs 60 per units. Which are to be paid by shopkeeper. Defective units found during testing are repaired at Rs 20 per unit.

1. Shopkeeper uses option I testing in March month and incurs repairing cost of. Rs 5600. Then find number of defective fans in March is what percent of total manufactured fans in that month?

- (a) $12\frac{1}{2}\%$ (b) 15% (c) $16\frac{2}{3}\%$ (d) $17\frac{1}{2}\%$ (e) 20%

2. For February month, find the difference of the extra (i.e. total of testing, repairing cost and penalties) incurred by the shopkeeper. For the both options if 150 units are defective in that months.

- (a) Rs 1000 (b) Rs 1200 (c) Rs 1250 (d) Rs 1400 (e) Rs 1350

3. Find ratio of all defective units of January to April months if in January he uses option I for testing and in April, option II as testing. Repairing cost of April is Rs 5300 more than that of January where as penalties for January is Rs 900 more than that of April

- (a) 3 : 8 (b) 2 : 5 (c) 11 : 18 (d) 4 : 9 (e) 8 : 15

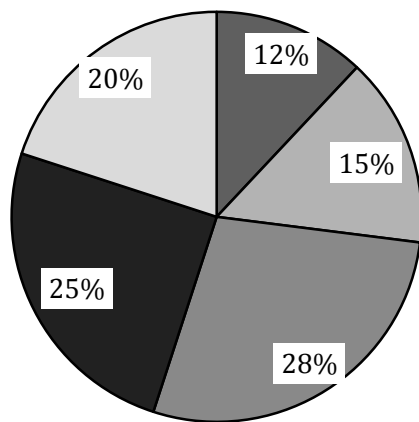
4. In May, shopkeeper uses option II for testing the whole units of fans produced and he has to pay penalties of Rs 1620 to the customer. Then, find the total units of fans manufactured in that month if total defective units are $25\frac{5}{7}\%$ in that month.

- (a) 980 (b) 1050 (c) 1071 (d) 1106 (e) 1120

Direction (5 – 10) : Given pie chart shows percentage distribution of viewers of a Tv channel in five different villages (A, B, C, D & E) and table shows number of viewers who subscribed the channel. Read the data carefully and answer the questions.

Note – Total viewers = Total subscriber + Total unsubscribe

Total viewers = 3000



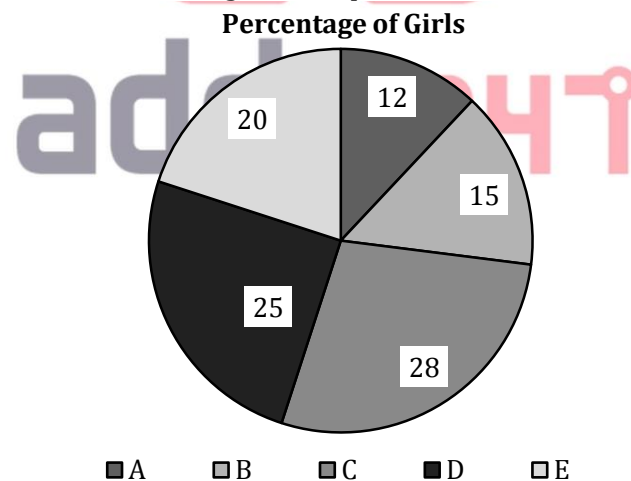
■ A ■ B ■ C ■ D ■ E

Villages	People who subscribed
A	220
B	250
C	440
D	350
E	180

5. Total unsubscribed viewers from B & E together is what percent more than total unsubscribed viewers from C?
 (a) 50% (b) 55% (c) 45% (d) 40% (e) 42%
6. If total male unsubscribed viewers in D is $66\frac{2}{3}\%$ more than that of female unsubscribed viewers, then find ratio of total male unsubscribed viewers in D to total unsubscribed viewers in A & C together?
 (a) 25 : 53 (b) 25 : 54 (c) 7 : 9 (d) 23 : 54 (e) 2 : 3
7. Find the central angle for total unsubscribed viewers in B & C and total subscribed viewers in E together with respect to total viewers?
 (a) 133.6° (b) 136.6° (c) 63.6° (d) 130.6° (e) 93.6°
8. Out of total viewers in village C, $46\frac{3}{7}\%$ are female and $\frac{7}{13}$ th of total female are unsubscribed viewers, then find total unsubscribed male viewers from village C?
 (a) 170 (b) 180 (c) 210 (d) 190 (e) 250
9. In another village F total subscribed viewers are 20% more than total unsubscribed viewers in village A and total subscribed viewers in village F are $\frac{3}{7}$ th of total viewers in that village. Find total unsubscribed viewers from village F is what percent less than total unsubscribed viewers from village C?
 (a) 42% (b) 44% (c) 48% (d) 46% (e) 40%
10. If the above data given for the year 2017 and in 2018 total viewers increased by 40%, while percentage distribution of viewers of TV channel in five different villages remain same as in 2017. If number of subscribed viewers from village A, B, D & E in 2018 increased by 25%, 20%, 14% & 10% respectively and total subscribed viewer from all the five village in 2018 are 1400, then find total unsubscribed viewers from C in 2018?
 (a) 942 (b) 952 (c) 948 (d) 956 (e) 964

Direction (11 – 16): Study the following data carefully and answer the following questions.

The pie chart shows the percentage distribution of total girls in five different classes in March month of 2019 and table shows the percentage of boys more or less than the girls in respective class for the same month and year.

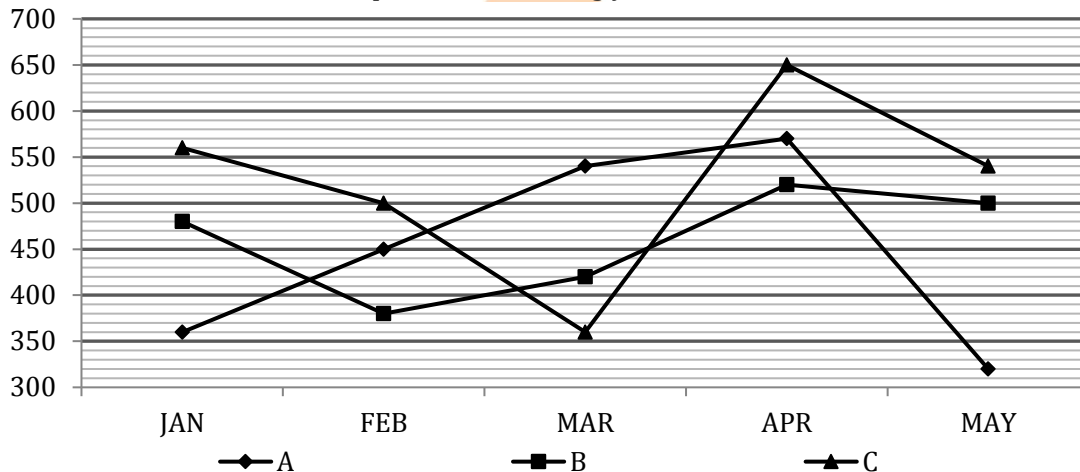


CLASS	% of boys more/less than girls
A	50% More
B	30% More
C	25% Less
D	24% More
E	25% More

11. What is the central angle for the percentage distribution of girls in class C?
 (a) 100.8° (b) 100.0° (c) 102.8° (d) 98.8° (e) 90.8°

12. In April 2019, number of girls and boys in class C are increased by $14\frac{2}{7}\%$ and $33\frac{1}{3}\%$ respectively as compared to previous month. Total students in class C in April 2019 are what percent more or less than total students in class C in March 2019 ?
 (a) $25\frac{2}{7}\%$ (b) $24\frac{2}{7}\%$ (c) $28\frac{4}{7}\%$ (d) $30\frac{2}{7}\%$ (e) $28\frac{2}{7}\%$
13. What is the ratio of number of boys in class B to number of boys in class E?
 (a) 33 : 50 (b) 39 : 49 (c) 44 : 47 (d) 37 : 40 (e) 39 : 50
14. What is the average of number of boys in class A, D and E if number of boys in class B are 195?
 (a) $245\frac{2}{3}$ (b) $240\frac{2}{3}$ (c) $236\frac{2}{3}$ (d) $241\frac{2}{3}$ (e) $246\frac{2}{3}$
15. If the difference between boys and girls in class D are 216, then what is the sum of boys in class A and girls in class C?
 (a) 1656 (b) 1545 (c) 1600 (d) 1664 (e) 1520
16. Total students in class B are what percent more/less than total students in class E ?
 (a) $27\frac{8}{9}\%$ (b) $27\frac{5}{9}\%$ (c) $25\frac{7}{9}\%$ (d) $25\frac{5}{9}\%$ (e) $23\frac{1}{3}\%$

Directions (17 - 21): Following Line Graph given provides the details of total number of rides taken by 3 different drivers in 5 different months and the Table DI given below provides the details of percentage of total female rides taken by all the drivers in 5 different months and answer the questions accordingly.

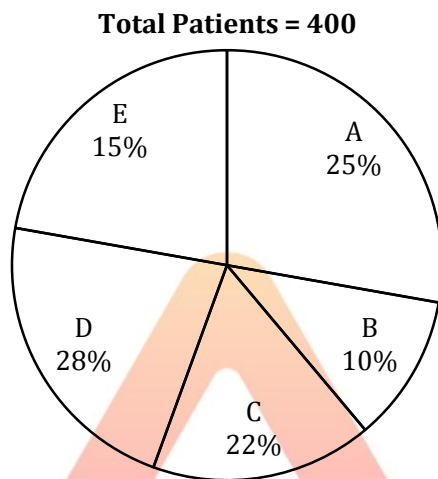


Month/ Driver	% of female ride taken by Driver A	% of female ride taken by Driver B	% of female ride taken by Driver C
JAN	40%	25%	30%
FEB	30%	40%	44%
MAR	55%	50%	40%
APR	40%	45%	30%
MAY	60%	48%	60%

17. Total number of male rides taken by Driver B in January and march together is approximately what percentage more than the total female rides taken by driver A in April and may together?
 (a) 40% (b) 36% (c) 45% (d) 30% (e) 50%
18. Find the total number of male rides taken by all the three drivers in March together?
 (a) 652 (b) 724 (c) 696 (d) 669 (e) 628
19. Find the difference between total no. of female ride taken by all the 3 drivers in January to the total no. of male rides taken by all the 3 drivers in march?
 (a) 327 (b) 294 (c) 268 (d) 214 (e) 237

20. Find the respective ratio of total no. of female rides taken by driver A in April and May together to the total no. of male ride taken by Driver B in January and march together?
 (a) 14:19 (b) 17:23 (c) 18:23 (d) 19:14 (e) 23:17
21. Find the total number of female rides taken by Driver B in all the five months together?
 (a) 848 (b) 956 (c) 984 (d) 918 (e) 884

Directions (22-26): Given pie chart provides the details of total number of patients visited to different doctors for their problem and the table provides the details of fees of different doctors. Read the instruction carefully and answer the question accordingly.



Note: -

A and B are Junior Doctor

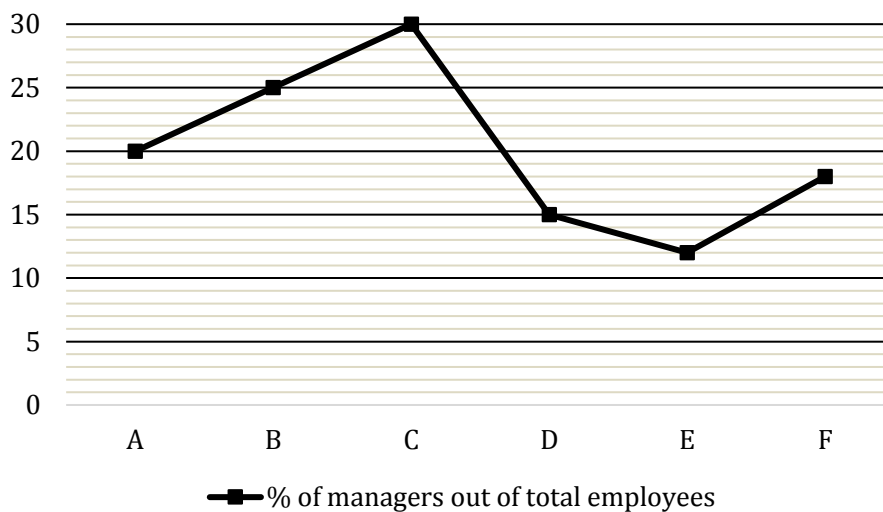
C and D are Senior Doctor

E is Dean

Doctor's Profile	Fees (in Rs)	Additional charge on fees
Junior Doctor	1000	15%
Senior Doctor	1500	20%
Dean	2000	25%

22. What is the difference between the total fees received by Doctor C and the total fees received by Doctor D?
 (a) Rs 40800 (b) Rs 43200 (c) Rs 38400 (d) Rs 36800 (e) Rs 34200
23. Find the respective ratio of total fees received by Doctor A from all its patient to the total fees received by Doctor E from all its patients
 (a) 27 : 31 (b) 30 : 23 (c) 23 : 30 (d) 31 : 27 (e) 29 : 31
24. Total fees received by junior doctor B is what percentage more/less than the total fees received by Doctor E?
 (a) $69\frac{1}{3}\%$ (b) $60\frac{2}{3}\%$ (c) 72% (d) $68\frac{2}{3}\%$ (e) 64%
25. If the Doctor E's fees is increased by 15% from the current fees, then find the total fees received by Doctor E when the fees is increased? (in Rs)
 (a) 1,72,500 (b) 1,78,500 (c) 2,12,000 (d) 1,92,500 (e) 2,04,000
26. Find the average of total fees received by both Junior Doctors and Senior Doctors together?
 (a) Rs 1,28,500 (b) Rs 1,25,800 (c) Rs 1,30,250 (d) Rs 1,22,350 (e) Rs 1,35,600

Direction (27 – 32): Line graph given below shows percentage of managers out of total employees in six (A, B, C, D, E & F) different companies and table shows number of female managers out of total managers in these six companies. Read the data carefully and answer the questions.



Companies	Total number of female managers
A	32
B	56
C	80
D	50
E	24
F	18

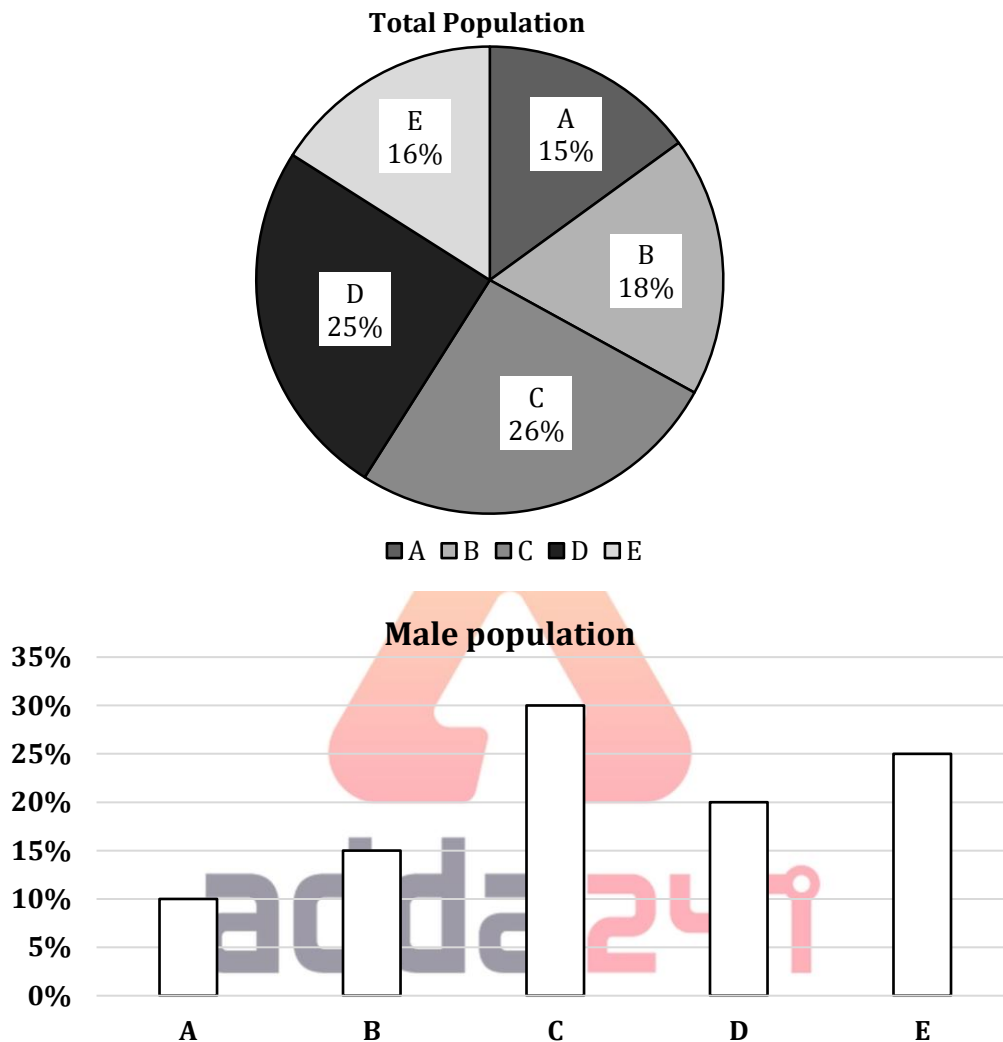
27. Out of total number of employee (Non managers + managers) in company B 40% are females. If out of Non managers employees in company B 40% are female employee, then find total number of Non managers employee in company B?
 (a) 480 (b) 420 (c) 400 (d) 360 (e) 240
28. If the total number of male managers in company C is 100 and the total female employee in C is 260, then find the total number of male employee (Non managers + managers) are what percent more than the total number of male managers in company C?
 (a) 160% (b) 280% (c) 140% (d) 340% (e) 240%
29. If the difference between total number of managers in company A and total number of employee (Non managers) in same company is 288, then find total number of male managers in company A?
 (a) 64 (b) 32 (c) 48 (d) 72 (e) 56
30. The ratio of total male managers in company F to total female managers in same company is 7 : 2. Find the number of total employee (Non managers) in company F?
 (a) 363 (b) 349 (c) 359 (d) 369 (e) 381
31. If total number of Non managers employees in company D is 612, then find total number of male managers in company D?
 (a) 78 (b) 88 (c) 68 (d) 48 (e) 58
32. The difference between total male managers in company E and the total female managers in company E is 50% of total female managers in that company, then find total number of employees in company E (male managers are more than female managers in company E)?
 (a) 400 (b) 300 (c) 500 (d) 600 (e) 800

Directions (33-38): Read the given pie chart carefully and answer the following questions.

Pie chart shows the distribution of total population of five villages (A, B, C, D and E) and Bar graph shows the male population (in %) in these five villages (A, B, C, D and E). Read the data carefully and answer the questions.

Note: 1. Difference between population of village A and B is 21.

2. Male population of village A is $38\frac{2}{21}\%$ of total population of same village.

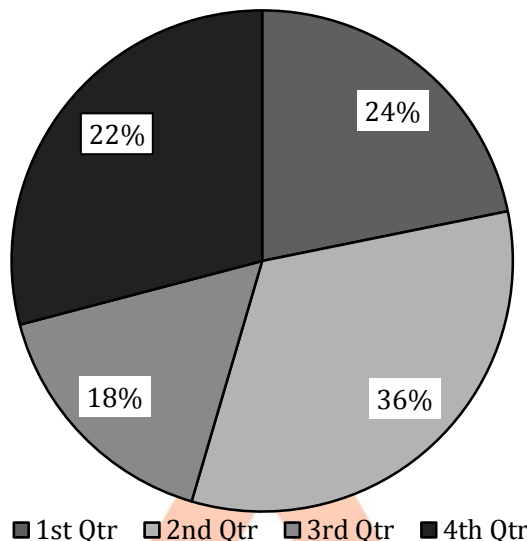


33. Find the ratio of male in village B and C together to the female in village B?
 (a) 45: 19 (b) 20: 9 (c) 30: 11 (d) 7: 5 (e) 11: 9
34. In village F total population is 75% more than that of village E. Ratio of male and female in village F is 9: 5. Find the average of female in village E and F.
 (a) 46 (b) 41 (c) 37 (d) 31 (e) 35
35. Females in village A is what percentage more than males in same village?
 (a) $38\frac{2}{21}\%$ (b) 25% (c) $61\frac{19}{21}\%$ (d) 62.5% (e) $38\frac{6}{13}\%$
36. Find the central angle of total population of village C.
 (a) 93.6 (b) 79.2 (c) 26 (d) 54.8 (e) 84.5
37. If 20% and 50% of total population of village A and C respectively are literate. Literate females of village A and C are 9 and 42 respectively. Find the total literate males of both the villages.
 (a) 49 (b) 61 (c) 54 (d) 63 (e) 51
38. Find the difference between total male population and total female population of village C.
 (a) 81 (b) 62 (c) 49 (d) 75 (e) 58

Direction (39– 42): Given below pie chart shows percentage distribution of total meetings held in four quarters of 2016, while table shows percentage of finance meetings held in these four quarters. Read the data carefully and answer the questions.

Note – Three (Finance, Management and Expenditure) types of meeting held in each of quarter.

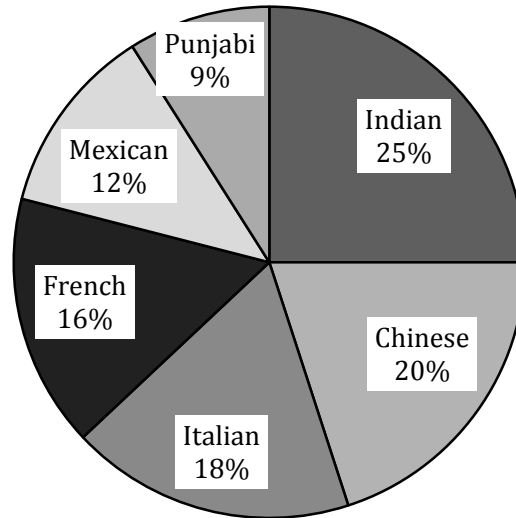
Total meetings held in 2016 = 1500



Quarters	Percentage of finance meeting
1	25%
2	$33\frac{1}{3}\%$
3	20%
4	40%

39. If total management meetings held in 3rd quarter is 40% more than total expenditure meetings held in that quarter and total management meetings held in 4th quarter is 20% more than total Expenditure meetings held in that quarter, then find difference between total management meetings held in 3rd & 4th quarter?
 (a) 14 (b) 18 (c) 16 (d) 12 (e) 20
40. In 2017 total meetings held is 40% more than those held in 2016 and percentage distribution of meetings held in four quarters remain same as 2016. If ratio of total management meetings to total expenditure meetings held in 1st quarter in 2016 is 7 : 8, then find total Expenditure meetings held in 1st quarter in 2016 is what percent of total meetings held in 3rd & 4th quarter of 2017?
 (a) $17\frac{1}{7}\%$ (b) $11\frac{5}{7}\%$ (c) $9\frac{5}{7}\%$ (d) $15\frac{5}{7}\%$ (e) $17\frac{5}{7}\%$
41. If total expenditure meetings held in 2nd quarter is 40% less than that of total management meetings held in that quarter, then find total expenditure meetings held in 2nd quarter is what percent less than total management & expenditure meetings held in 1st quarter?
 (a) 40% (b) 45% (c) 25% (d) 60% (e) 50%
42. If total meetings held in 1st quarter of 2017 is 25% more than total finance meeting held in 1st & 3rd quarter of 2016 together and ratio of finance meeting, management meeting and expenditure meeting held in 1st quarter of 2017 is 9 : 7 : 5, then find ratio of total management meeting held in 1st quarter of 2017 to total finance meeting held in 2nd quarter of 2016?
 (a) 1 : 4 (b) 1 : 2 (c) 1 : 5 (d) 1 : 3 (e) None of these

Directions (43-46): Pie chart shows the percentage distribution of people who likes different types of food.



The table shows the ratio of male to female above and below 25 years who likes different types of food

Note: Consider no person has exactly 25 years age.

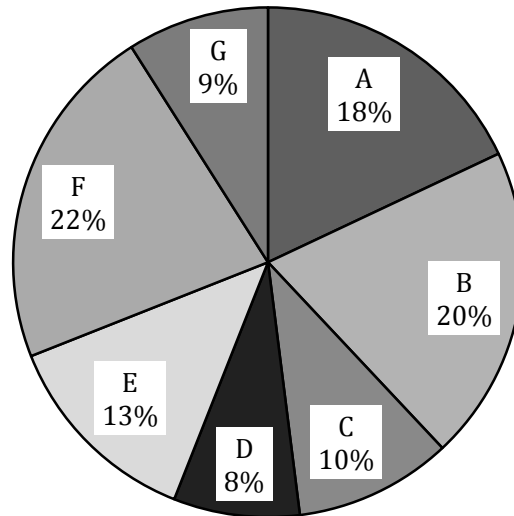
	Below 25 years	Above 25 years
	Male : Female	Male : Female
Indian	8 : 5	9 : 7
Chinese	4 : 3	5 : 4
Italian	5 : 6	7 : 3
French	11 : 12	13 : 12
Mexican	3 : 4	5 : 6
Punjabi	5 : 4	3 : 5

- 43.** Total number of people who likes Italian is 48 lakhs. Total number of people comprising male above 25 years who likes Punjabi and females below 25 years who like Punjabi food is 10 lakhs, then find the total number of people who likes Punjabi for people below 25 yr.
 (a) 8 L (b) 10 L (c) 9.5 L (d) 15 L (e) 14.4 L
- 44.** If the total number of females below 25 years who likes Chinese and male above 25 years whose likes Chinese is 9.6 lakh and 14 lakhs respectively, then what is the total number of people who likes Indian.
 (a) 55.5 (b) 64.6 (c) 72.8 (d) 59.5 (e) 57.2
- 45.** If people below 25 years who likes French are 23,000 and difference between people below 25 years and above 25 years who likes French is 11,600 then, find the difference between total number of people who likes Mexican and Indian.
 (a) 43244 (b) 46254 (c) 27950 (d) 50130 (e) 45240
- 46.** If total number of people who likes Indian is 1 lakh then what is the difference of people whose likes Mexican and French.
 (a) 1 L (b) 2.5 L (c) 0.5 L (d) 0.16 L (e) 0.2 L

Directions (47-50): Given below is the pie chart which shows the percentage distribution of books of publisher 'X' sold by 7 different books store in year 2016. Table shows the ratio of books sold of publisher X to publisher Y in these seven book stores.

Some values are missing in the table. You have to calculate these values if required to answer the questions.

Total books sold of Publisher X = 25,700



Book store	Ratio of books sold of publisher X to publisher Y		
A	3	:	–
B	–	:	5
C	2	:	3
D	–	:	–
E	13	:	5
F	11	:	–
G	3	:	4

47. What is the total number of books sold by store A and B together if books sold by store A for publisher Y is $33\frac{1}{3}\%$ more than that of publisher X and Books sold by store B for publisher X is 20% less than that of publisher Y.
 (a) 22359 (b) 21257 (c) 20256 (d) 23244 (e) 22556
48. What is the total number of books sold by store D if books sold of publisher Y in store D is 25% more than that of books sold by store D of publisher X
 (a) 2520 (b) 4020 (c) 4626 (d) 4422 (e) 4528
49. Books sold by store E, F and G together of publisher X is what percent more or less than books sold by these store of publisher Y if books sold by store F of publisher Y is $\frac{100}{11}\%$ more than that of books sold by F of publisher X.
 (a) $\frac{400}{31}\%$ (b) $\frac{300}{41}\%$ (c) $\frac{200}{9}\%$ (d) $\frac{100}{9}\%$ (e) $\frac{100}{11}\%$
50. If in year 2017 total books sold by store E is increased by $33\frac{1}{3}\%$ over previous year and ratio of books sold of publisher X and Y by store E in 2017 is 11 : 13 then books sold by store E of publisher X in 2016 is what percent more or less than that of books sold of publisher X by store E in 2017.
 (a) $\frac{200}{11}\%$ (b) $\frac{200}{9}\%$ (c) $\frac{100}{11}\%$ (d) $\frac{100}{9}\%$ (e) None of these

Previous Years' Solutions of Mains

1. (c): Number of defective fans found during testing in March = $\frac{5600}{20} = 280$
Total number of defective fans in that month = $\frac{280}{70} \times 100 = 400$
Required % = $\frac{400}{2400} \times 100 = 16\frac{2}{3}\%$
2. (b): Option I
Extra cost = $1600 \times 2.5 + 150 \times \frac{70}{100} \times 20 + \frac{150 \times 30}{100} \times 60$
= Rs (4000 + 2100 + 2700) = Rs 8800
Option II
Extra cost = $1600 \times 4 + 150 \times \frac{90}{100} \times 20 + \frac{150 \times 10}{100} \times 60$
= Rs 10000
Required difference = 1200
3. (d): Let number of all defective units in January and April be x and y respectively.
Atq,
 $y \times \frac{90}{100} \times 20 - \frac{x \times 70}{100} \times 20 = 5300$
 $\Rightarrow 18y - 14x = 5300$... (i)
And,
 $\frac{x \times 30}{100} \times 60 - \frac{y \times 10}{100} \times 60 = 900$
 $\Rightarrow 18x - 6y = 900$... (ii)
From (i) & (ii)
X = 200 and y = 450
Required ratio = $\frac{200}{450} = 4 : 9$
4. (b): Number of defective items sold to the customer = $\frac{1620}{60} = 27$
Number of all defective units in may = $\frac{27}{10} \times 100 = 270$
Total manufactured units = $\frac{270 \times 7}{180} \times 100 = 1050$
5. (b): Total unsubscribed viewers from B = 3000
 $\times \frac{15}{100} - 250 = 200$
Total unsubscribed viewers from E = 3000
 $\times \frac{20}{100} - 180 = 420$
Total unsubscribed viewers from C = 3000
 $\times \frac{28}{100} - 440 = 400$
Required percentage = $\frac{(200+420)-400}{400} \times 100$
= $\frac{220}{400} \times 100 = 55\%$
6. (b): Let total female unsubscribed viewers in D be 3x
So, total male unsubscribed viewers in D will be 5x
Total male unsubscribed viewers in D = $(3000 \times \frac{25}{100} - 350) \times \frac{5x}{8x} = 250$
Total unsubscribed viewers in A & C = $(3000 \times \frac{12}{100} - 220) + (3000 \times \frac{28}{100} - 440)$
= 140 + 400
= 540
Required ratio = $\frac{250}{540}$
= 25 : 54
7. (e): Total unsubscribed viewers from B = 3000
 $\times \frac{15}{100} - 250 = 200$
Total unsubscribed viewers from C = 3000
 $\times \frac{28}{100} - 440 = 400$
Total unsubscribed viewers in B & C and subscribed viewers in E = 200 + 400 + 180 = 780
Required central angle = $\frac{780}{3000} \times 360$
= 93.6°
8. (d): Total female viewers in village C = $3000 \times \frac{28}{100} \times \frac{325}{7} \times \frac{1}{100} = 390$
Total female unsubscribed viewers in village C = $390 \times \frac{7}{13} = 210$
Total male unsubscribed viewers in village C = $(3000 \times \frac{28}{100} - 440) - 210 = 190$
9. (b): Total subscribed viewers from village F = $(3000 \times \frac{12}{100} - 220) \times \frac{120}{100} = 168$
Total unsubscribed viewers from village F = 168
 $\times \frac{4}{3} = 224$
Total unsubscribed viewers from C = 3000
 $\times \frac{28}{100} - 440 = 400$
Required percentage = $\frac{400 - 224}{400} \times 100$
= $\frac{176}{400} \times 100$
= 44%
10. (c): Total viewers from all the five village in 2018 = $3000 \times \frac{140}{100} = 4200$
Total subscribed viewers from A in 2018 = 220
 $\times 1.25 = 275$
Total subscribed viewers from B in 2018 = 250
 $\times 1.2 = 300$
Total subscribed viewers from D in 2018 = 350
 $\times 1.14 = 399$

Total subscribed viewers from E in 2018 = $180 \times 1.1 = 198$

Total subscribed viewers from C in 2018 = $1400 - (275 + 300 + 399 + 198) = 228$

Total unsubscribed viewers from C in 2018
 $= 4200 \times \frac{28}{100} - 228 = 948$

11. (a): Required central angle $\rightarrow \frac{360}{100} \times 28 = 100.8^\circ$

12. (c): Let total girls in class C in March 2019 be $28x$
 Number of girls class C in April 2019 = $(1 + \frac{1}{7}) \times 28x = 35x$
 Number of boys in class C in March 2019
 $= \frac{(100-25)}{100} \times 28x = 21x$
 Number of boys in class C in April 2019
 $= (1 + \frac{1}{3}) \times 21x = 28x$
 Required percentage = $\frac{35x+28x-28x-21x}{28x+21x} \times 100$
 $= \frac{14}{49} \times 100 = 28\frac{4}{7}\%$

13. (e): Let number of girls in class B be $15x$ and number of girls in class E be $20x$
 Number of boys in class B = $\frac{(100+30)}{100} \times 15x = \frac{39x}{2}$
 Number of boys in class E = $\frac{(100+25)}{100} \times 20x = 25x$
 Required ratio = $\frac{39}{2 \times 25} = 39:50$

14. (e): Let number of girls in class A, B, D and E be $12x$, $15x$, $25x$ and $20x$ respectively.
 ATQ, $\frac{(100+30)}{100} \times 15x = 195$
 $15x = \frac{1950}{13}$
 $x = 10$
 Number of boys in class A = $\frac{(100+50)}{100} \times 12x = 18x$
 Number of boys in class D = $\frac{(100+24)}{100} \times 25x = 31x$
 Number of boys in class E = $\frac{(100+25)}{100} \times 20x = 25x$
 Required average = $(18 + 31 + 25) \times \frac{10}{3} = 246\frac{2}{3}$

15. (a): Let girls in class D be $25x$ then boys in D will be $31x$
 So, $6x = 216$
 $x = 36$
 Boys in class A = $12x \times \frac{150}{100} = 18x$
 Girls in class C = $28x$
 Required sum = $18x + 28x = 46 \times 36 = 1656$

16. (e): Let total girls in class B and class E be $15x$ and $20x$ respectively
 Total boys in class B = $19.5x$
 Total boys in class E = $25x$

Required percentage = $\frac{45x-34.5x}{45x} \times 100 = 23\frac{1}{3}\%$

17. (b): Total number of male rides taken by Driver B in January and March together
 $= 480 \times \frac{75}{100} + 420 \times \frac{50}{100}$
 $= 360 + 210$
 $= 570$
 Total no. of female rides taken by driver A in April and may together
 $= 570 \times \frac{40}{100} + 320 \times \frac{60}{100}$
 $= 228 + 192$
 $= 420$
 Required percentage = $\frac{570-420}{420} \times 100$
 $= 35.71\% = 36\%$ (approx.)

18. (d): Total number of male rides taken by all the three drivers in March together
 $= 540 \times \frac{45}{100} + 420 \times \frac{50}{100} + 360 \times \frac{60}{100}$
 $= 243 + 210 + 216$
 $= 669$

19. (e): Total no. of female ride taken by all the 3 drivers in January
 $= 360 \times \frac{40}{100} + 480 \times \frac{25}{100} + 560 \times \frac{30}{100}$
 $= 144 + 120 + 168$
 $= 432$
 Total no. of male rides taken by all the 3 drivers in March
 $= 540 \times \frac{45}{100} + 420 \times \frac{50}{100} + 360 \times \frac{60}{100}$
 $= 243 + 210 + 216$
 $= 669$
 Required difference = $669 - 432 = 237$

20. (a): Total no. of female rides taken by driver A in April and May together
 $= 570 \times \frac{40}{100} + 320 \times \frac{60}{100}$
 $= 228 + 192$
 $= 420$
 Total no. of male ride taken by Driver B in January and march together
 $= 480 \times \frac{75}{100} + 420 \times \frac{50}{100}$
 $= 360 + 210$
 $= 570$
 Required ratio = $\frac{420}{570} = 14 : 19$

21. (b): Total number of female rides taken by Driver B in all the five months together
 $= 480 \times \frac{25}{100} + 380 \times \frac{40}{100} + 420 \times \frac{50}{100} + 520 \times \frac{45}{100}$
 $+ 500 \times \frac{48}{100}$
 $= 120 + 152 + 210 + 234 + 240$

$$= 956$$

22. (b): Total fees of Doctor C per patient = 1500 + $1500 \times \frac{20}{100}$ = Rs 1800

Total fees received by Doctor C = 1800 × 88
= Rs 158400

Total fees of Doctor D per patient = 1500 + $1500 \times \frac{20}{100}$ = Rs 1800

Total fees received by Doctor D = 1800 × 112
= Rs 201600

Required difference = 201600 – 158400
= Rs 43200

23. (c): Total fees of Doctor A per patient = 1000 + $1000 \times \frac{15}{100}$ = Rs 1150

Total fees received by Doctor A = 1150 × 100
= 115000 Rs

Total fees of Doctor E per patient = 2000 + $2000 \times \frac{25}{100}$ = Rs 2500

Total fees received by Doctor E = 2500 × 60
= 150000 Rs

Required ratio = $\frac{115000}{150000}$
= 23 : 30

24. (a): Total fees of Doctor B per patient = 1000 + $1000 \times \frac{15}{100}$ = Rs 1150

Total fees received by Doctor B = 1150 × 40
= 46000 Rs

Total fees of Doctor E per patient = 2000 + $2000 \times \frac{25}{100}$ = Rs 2500

Total fees received by Doctor E = 2500 × 60
= 150000 Rs

Required percentage = $\frac{150000 - 46000}{150000} \times 100 = 69\frac{1}{3}\%$

25. (a): Current fees of Doctor E per patients = Rs 2500
Increased fees of Doctor E per patients = 2500 + $2500 \times \frac{15}{100}$ = Rs 2875

Total fees received by Doctor E (after fees increase) = 2875 × 60 = Rs 172500

26. (c): Total fees of Junior Doctor per patient = 1000 + $1000 \times \frac{15}{100}$ = Rs 1150

Total fees of Senior Doctor per patient = 1500 + $1500 \times \frac{20}{100}$ = Rs 1800

Fees received by both junior doctor and senior doctor together
= (100 + 40) × 1150 + (112 + 88) × 1800 = 161000 + 360000 = 521000

Required average = $\frac{521000}{4}$ = Rs 130250

27. (b): Let total employees in company B = 100x

Total female employees in company B = 100x
 $\times \frac{40}{100} = 40x$

Total managers in company B = 100x × $\frac{25}{100} = 25x$

And total Non-managers employee in company B = (100x – 25x) = 75x

Also, give total Non-managers female employees in company B = 75x × $\frac{40}{100} = 30x$

40x – 30x = 56

10x = 56

x = 56/10

So, total number of Non managers employee in company B 75x = $\frac{56}{10} \times 75 = 420$

28. (e): Let total employee in company C = 100x

So, total managers in company C = 100x × $\frac{30}{100} = 30x$

Given, 30x = (80 + 100)

x = 6

total employee = 100x = 100 × 6 = 600

Total number of male employees (Non managers + managers) in company C = Total number of employees in company C (Non managers + managers) – Total number of female employees in company C (Non managers + managers)

Total number of male employees (Non managers + managers) in company C = 6 × 100 – 260 = 340

Required percentage = $\frac{(340 - 100)}{100} \times 100 = 240\%$

29. (a): Let total employee in company A = 100x

So, total number of managers in company A = 100
 $\times \frac{20}{100} = 20x$

Total number of male managers in company A = (20x – 32)

And, total number of employee (Non managers) in company A = (100x – 20x) = 80x

ATQ –

80x – 20x = 288

60x = 288

10x = 48

x = 48/10

Total number of male managers in company A =

$(20 \times \frac{48}{10} - 32)$

= 96 – 32 = 64

30. (d): Let total number of employees in company F = 100x

Total number of managers in company F = 100x
 $\times \frac{18}{100} = 18x$

Total number of employees (Non managers) in company F = $100x - 18x = 82x$
 total male managers in company F to total female managers in same company is $7u : 2u$
 $2u = 18$
 $u = 9$
 total no of (male and female) managers in company F = $9u = 9 \times 9 = 81$
 So, $18x = 81$
 $x = 81/18$
 Required number of total employee (Non managers) in company F = $\frac{81}{18} \times 82x = 369$

- 31. (e):** Let total number of employees in company D = $100x$
 So, total number of Non managers employees in company D = $100x \times \frac{(100-15)}{100} = 85x$
 Given, $85x = 612$
 $x = 7.2$
 total number of managers in company D = $15x$
 Total number of male managers in company D = $7.2 \times 15 - 50 = 58$
- 32. (c):** Let total employee in company E = $100x$
 And, total number of managers in company E = $100x \times \frac{12}{100} = 12x$
 Total number of male managers in company E = $12x - 24$
 Give, $12x - 24 - 24 = \frac{24}{2}$
 $12x = 60$
 $x = 5$
 So, total number of employees in company E = $5 \times 100 = 500$

Sol. (33-38):

Let total population of five villages be $100x$.

So, $18x - 15x = 21$

$x = 7$

Population of village A = $15 \times 7 = 105$

Male population of village A = $\frac{8}{21} \times 105 = 40$

Now,

Villages	Total Population	Male population	Female population
A	105	40	65
B	126	60	66
C	182	120	62
D	175	80	95
E	112	100	12

- 33. (c):** Required ratio = $\frac{120+60}{66} = 30:11$

- 34. (b):** Total population of village F = $112 \times \frac{175}{100} = 196$

No. of female in village F = $\frac{5}{14} \times 196 = 70$

So, required average = $\frac{70+12}{2} = 41$

- 35. (d):** Required percentage = $\frac{65-40}{40} \times 100$
 $= 62.5\%$

- 36. (a):** Required angle = $\frac{182}{700} \times 360 = 93.6^\circ$

- 37. (b):** Literate population from village A = $\frac{20}{100} \times 105 = 21$
 Literate population from village C = $\frac{50}{100} \times 182 = 91$
 Literate male from village A = $21 - 9 = 12$
 Literate male from village C = $91 - 42 = 49$
 So, required population = $12 + 49 = 61$

- 38. (e):** Required difference = $120 - 62$
 $= 58$

- 39. (b):** Let total expenditure meetings held in 3rd quarter = $5x$
 So, total management meetings held in 3rd quarter = $7x$
 Also, total expenditure meetings held in 4th quarter = $5y$
 So, total management meetings held in 4th quarter = $6y$
 Total management meetings held in 3rd quarter = $1500 \times \frac{18}{100} \times \frac{80}{100} \times \frac{7x}{(5x+7x)} = 126$
 Total management meetings held in 4th quarter = $1500 \times \frac{22}{100} \times \frac{60}{100} \times \frac{6y}{(5y+6y)} = 108$
 Required difference = $126 - 108 = 18$

- 40. (a):** Total meetings held in 2017 = $1500 \times \frac{140}{100} = 2100$
 Total expenditure meetings held in 1st quarter in 2016 = $1500 \times \frac{24}{100} \times \frac{75}{100} \times \frac{8}{15} = 144$
 Total meetings held in 3rd & 4th quarter of 2017 = $2100 \times \frac{(18+22)}{100} = 840$
 Required percentage = $\frac{144}{840} \times 100$
 $= 17\frac{1}{7}\%$

- 41. (e):** Let total management meetings held in 2nd quarter = $5x$
 So, total expenditure meetings held in 2nd quarter = $3x$
 Total expenditure meetings held in 2nd quarter = $1500 \times \frac{36}{100} \times \frac{2}{3} \times \frac{3x}{(5x+3x)} = 135$
 Total management & expenditure meetings held in 1st quarter = $1500 \times \frac{24}{100} \times \frac{75}{100} = 270$
 Required percentage = $\frac{270-135}{270} \times 100$
 $= \frac{135}{270} \times 100 = 50\%$

42. (d): Total meetings held in 1st quarter of 2017

$$= \left(1500 \times \frac{24}{100} \times \frac{25}{100} + 1500 \times \frac{18}{100} \times \frac{20}{100}\right) \times \frac{125}{100}$$

$$= [90 + 54] \times \frac{125}{100}$$

$$= 180$$

Total management meetings held in 1st quarter of 2017 = $180 \times \frac{7}{21} = 60$

Total finance meetings held in 2nd quarter of 2016 = $1500 \times \frac{36}{100} \times \frac{1}{3} = 180$

Required ratio = $\frac{60}{180} = 1:3$

43. (e): Total people who like Punjabi = $\frac{48}{18} \times 9 = 24$ lakh

Let total people below 25 yr who likes Punjabi = x

$$\text{Then, } (24 - x) \frac{3}{8} + \frac{4}{9}x = 10$$

$$x = 14.4 \text{ L}$$

44. (d): Total number of people below 25 years who likes

$$\text{Chinese} = \frac{9.6}{3} \times 7$$

$$= 3.2 \times 7$$

$$= 22.4 \text{ L}$$

Total number of people above 25 years who likes

$$\text{Chinese} = \frac{14}{5} \times 9$$

$$= 2.8 \times 9$$

$$= 25.2 \text{ L}$$

Total people who like Indian = $\frac{(22.4+25.2)}{20} \times 25 = 59.5 \text{ Lakh}$

45. (c): Let total people who like French food = x

Then,

$$23000 - (x - 23000) = 11600$$

$$46000 - x = 11600$$

$$x = 46000 - 11600$$

$$= 34400$$

$$\text{Required difference} = \frac{34400}{16} \times 13 = 27950$$

46. (d): Total people in the town = $\frac{1}{25} \times 100 = 4 \text{ L}$

$$\text{Required difference} = \frac{4}{100} \times 4 = 0.16 \text{ L}$$

47. (a): Total books sold by store A

$$= 18 \times 257 + \frac{18}{3} \% \times 4 \times 25700$$

$$= 18 \times 257 + 24 \times 257$$

$$= 257 \times 42$$

Total books sold by store B

$$= 20 \times 257 + \frac{20 \times 257 \times 5}{4}$$

$$= 257 \times 45$$

Total books sold by both store

$$= 257(45 + 42)$$

$$= 257 \times 87$$

$$= 22,359$$

48. (c): Total books sold by store D

$$= 8 \times 257 + 8 \times 257 \times \frac{5}{4}$$

$$= 257(8 + 10)$$

$$= 257 \times 18$$

$$= 4626$$

49. (b): Total books of publisher X sold by store E, F and G together = 44×257

Total books of publisher Y sold by store E, F and G together

$$= 25700 \left(\frac{13\%}{13} \times 5 + 22\% \times \frac{12}{11} + 9\% \times \frac{4}{3} \right)$$

$$= 25700(5\% + 24\% + 12\%)$$

$$= 25700(41\%)$$

$$\text{Required percentage} = \frac{257(44-41)}{257 \times 41} \times 100 = \frac{3}{41} \times$$

$$100 = \frac{300}{41} \%$$

50. (a): Total books sold by store E in 2017

$$= \frac{4}{3} (13 \times 257 + 5 \times 257)$$

$$= 4 \times 257 \times 6$$

$$= 257 \times 24$$

$$\text{Required percentage} = \frac{257 \times 13 - 257 \times 24 \times \frac{11}{24}}{257 \times 24 \times \frac{11}{24}} \times 100$$

$$= \frac{257(13-11)}{257 \times 11} \times 100 = \frac{200}{11} \%$$



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Chapter 07

Radar Graph

In the Radar Graph, the values of variables are represented with respect to a central point. The values are represented in proportion with the distances from this central point. This graph can be seen as a circular line graph. This graph is also known as spider or web graph.



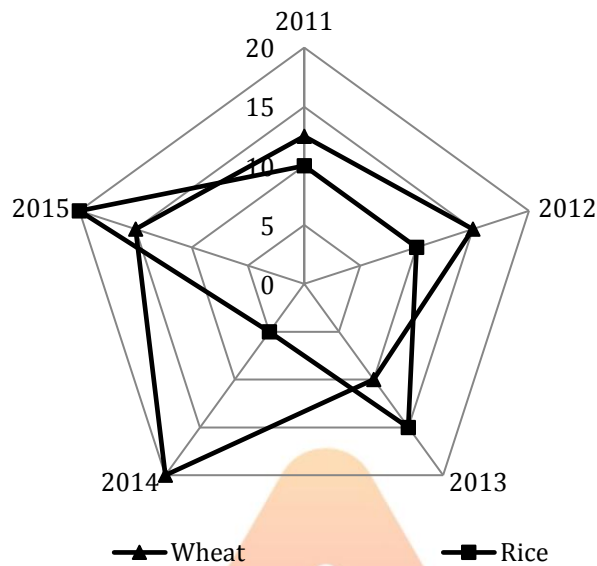
This chapter contains:

- Concept with Solved Examples
- Practice MCQs for Prelims
- Practice MCQs for Mains
- Previous Years' Questions of Prelims
- Previous Years' Questions of Mains

Solved Examples

Directions (1-5): Study the following Radar graph and answer the questions based on it.

Given below is the Radar graph which shows the percentage rise in price of Wheat & Rice over the given years.



1. If ratio between price of rice & wheat in 2014 is 3 : 4 then what will be their ratio of price in 2015

(a) 20 : 23 (b) 19 : 21 (c) 18 : 23 (d) 23 : 28 (e) 17 : 19

Sol. (c); Let ratio of price of rice to price of wheat in 2014 be $3x$ and $4x$

Ratio of price of rice to price of wheat in 2015 = $(120\% \text{ of } 3x) : (115\% \text{ of } 4x) = 18 : 23$

2. If price of wheat in year 2011 is 7200 Rs /Quintal then what will be its price in year 2013

(a) 8420 (b) 9012 (c) 10500 (d) 83250 (e) 9108

Sol. (e); Price of wheat in 2013 = $7200 \times \frac{115}{100} \times \frac{110}{100} = 9108$

3. What is the effective percentage increase in price of wheat from year 2011 to year 2013

(a) 30% (b) 22% (c) 23.5% (d) 26.5% (e) 32.75%

Sol. (d); Let price of wheat in 2011 = 100

so, price of wheat in 2013 = $\frac{115}{100} \times \frac{110}{100} \times 100 = 126.5$

So, effective increases equals = 26.5%

4. If a person expends Rs 4140 in buying rice at the rate of 120 Rs/kg in year 2012 then he has to reduce his consumption of rice by how many kg in year 2013 for the same expenditure of 4140.

(a) 4.5 kg (b) 3 kg (c) 2 kg (d) 2.5 kg (e) 4 kg

Sol. (a); In 2012 person buys = $\frac{4140}{120}$ kg of Rice

So, in 2013 person buys = $\frac{4140}{\frac{115}{100} \times 120}$ kg of rice

So decrease in consumption = $34.5 - 30 = 4.5$ kg

5. If the price of wheat in 2013 is 132 Rs/kg then what will be total cost of 25 kg of wheat in 2012.

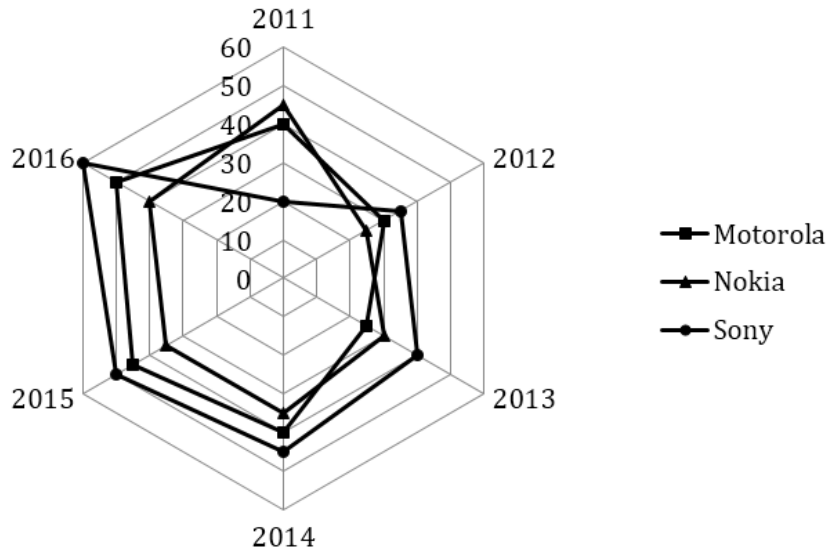
(a) 1250 Rs (b) 3000 Rs (c) 1500 Rs (d) 2000 Rs (e) 2500 Rs

Sol. (b); Price per kg of wheat in 2012 = $\frac{132 \times 100}{110} = 120$

Total cost for 25 kg of wheat in 2012 = $120 \times 25 = 3000$ Rs

Directions (6-10): Study the graph carefully to answer the questions that follow.

PERCENT INCREASE IN PROFIT OF THREE COMPANIES OVER THE YEARS



6. If profit for company Nokia in 2012 is 2000 and expenditure in 2013 for company Nokia is 50,000, then what is the total revenue in 2013 for Nokia? Give that total revenue = expenditure + profit.

(a) Rs. 52600 (b) Rs.54200 (c) Rs.53280 (d) Rs.55800 (e) Rs.56020

Sol. (a); Profit in 2013 = $2000 \times \frac{130}{100} = \text{Rs.}2600$

Total revenue = 50,000 + 2600 = Rs.52600

7. If profit in year 2015 for company Sony is 3000 and profit of company Motorola in 2013 is equal to profit of company Sony in 2014 then what is the profit of company Motorola in 2013 ?

(a) Rs.1500 (b) Rs.4000 (c) Rs.3500 (d) Rs.2000 (e) Rs.2500

Sol. (d); Profit of company Motorola in 2013 = $\frac{3000 \times 100}{150} = \text{Rs.}2000$

8. What is the average percentage increase in profit for company Nokia over all the years?

(a) 49% (b) 32% (c) 23% (d) 38% (e) 35%

Sol. (e); Required average = $\frac{45+25+30+35+35+40}{6} = \frac{210}{6} = 35\%$

9. What was the percentage increase in percent increase of profit of company Motorola in the year 2014 over its previous year ?

(a) 60% (b) 65% (c) 55% (d) 50% (e) 70%

Sol. (a); Required percentage = $\frac{40-25}{25} \times 100 = \frac{15}{25} \times 100 = 60\%$

10. If profit earned by company Nokia in 2014 is 27,000 and by company Sony in 2014 is 43500 then what is the total profit earned by them in year 2013?

(a) Rs. 25,000 (b) Rs. 35,000 (c) Rs. 40,000 (d) Rs. 50,000 (e) Rs. 45,000

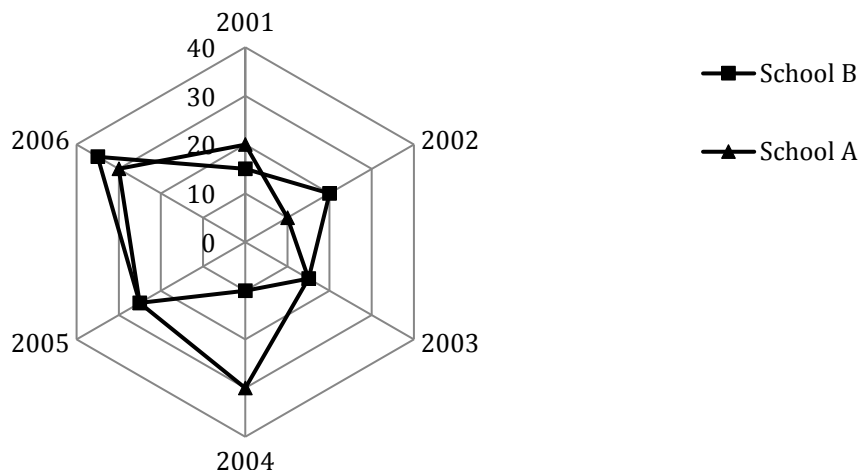
Sol. (d); Profit earned by Company Nokia in 2013 = $\frac{27000 \times 100}{135} = \text{Rs.}20,000$

Profit earned by company Sony in 2013 = $\frac{43500 \times 100}{145} = \text{Rs.}30,000$

Total profit = Rs.50,000

Directions (11-15): The Radar graph shows the percentage increase in the number of students passing out from schools A and B with respect to the number of students passed in 2000. Study the Radar graph given below and answer the following questions.

No. of students passed in 2000 = 200 (same for both schools A and B)



11. If the ratio of boys to girls (who passed out) in 2002 from school B was 6 : 4 and the ratio of students with Science background to those with non-science background was 7 : 3, then find the number of girls who had non-Science background from school B in 2002 ? (Given: boys with Science background were $85\frac{5}{7}\%$ of the students with Science background)

(a) 72 (b) 48 (c) 96 (d) 108 (e) 82

Sol. (a); Total no. of girls who passed out in 2002 from school B = $\frac{4}{10} \times 200 \times \frac{120}{100} = 96$

$$\text{No. of students with Science background} = \frac{7}{10} \times 240 = 168$$

$$\text{Girls with Science background} = \frac{1}{7} \times 168 = 24$$

$$\text{Hence, girls without Science background} = 96 - 24 = 72$$

12. If the ratio of boys to girls (who passed) in 2000 from school A was 12 : 8 and it was the same in 2004 as well for same school, then find the percentage increase in the number of girls passing out in 2004 from school A with respect to that of 2000 from the same school ?

(a) 35% (b) 30% (c) 45% (d) 60% (e) None of these

Sol. (b); No. of girls in 2000 = 80

$$\text{No. of girls in 2004} = \frac{8}{20} \times \frac{130}{100} \times 200 = 104$$

$$\text{Percentage \%} = \frac{104-80}{80} \times 100 = \frac{24}{80} \times 100 = 30\%$$

13. What is ratio of the average number of students passed from school A in 2001, 2002 and 2004 to that of from school B in 2002, 2004 and 2005?

(a) 73 : 71 (b) 72 : 67 (c) 72 : 71 (d) 75 : 71 (e) 71 : 72

Sol. (c); Required ratio = $\frac{\frac{240+220+260}{3}}{\frac{240+220+250}{3}} = \frac{720}{710} = \frac{72}{71}$

14. If $77\frac{7}{9}\%$ of the students who passed out from school B in 2006 went on to pursue engineering and the ratio of students who pursued engineering from school B in 2006 to that of from school A in 2005 is 3 : 2, then find the number of students who didn't pursue engineering from school A in 2005 ?

(a) 140 (b) 112 (c) 120 (d) 110 (e) 180

Sol. (d); No. of students from school B who pursued engineering in 2006 = $\frac{7}{9} \times \frac{135}{100} \times 200 = 210$

$$\text{No. of students from school A pursued engineering in 2005} = \frac{2}{3} \times 210 = 140$$

$$\text{No. of students from school A who didn't pursue engineering in 2005} = \frac{125}{100} \times 200 - 140 = 250 - 140 = 110$$

15. What is the difference of the number of students who passed of school B in year 2004, 2005 and 2006 and number of students who passed of school A in same year?

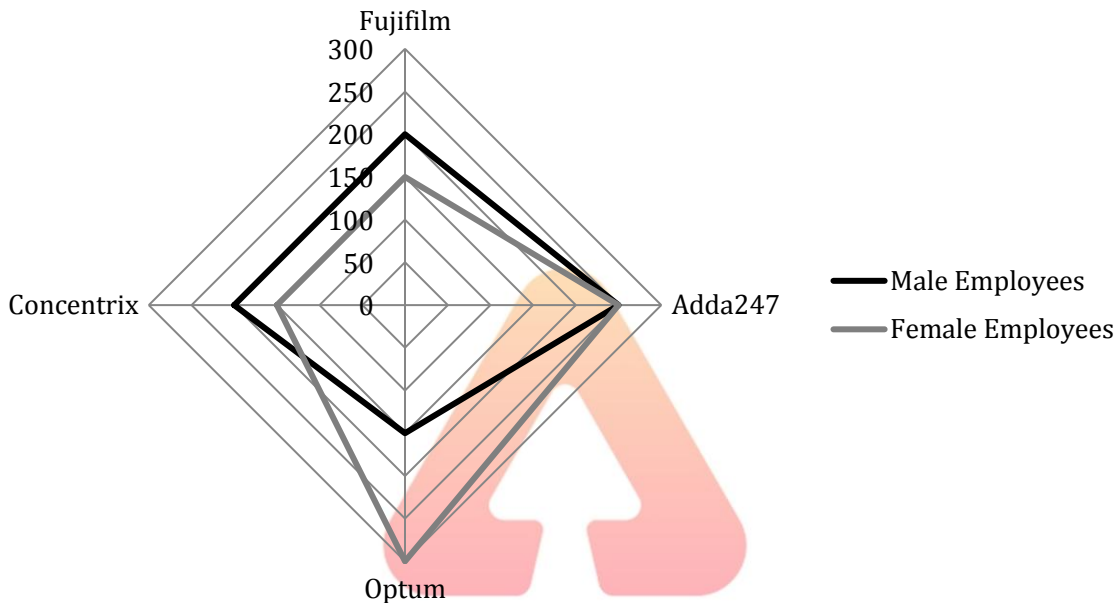
(a) 50 (b) 40 (c) 20 (d) 30 (e) 80

Sol. (d): Required difference

$$= \left[200 \times \frac{110}{100} + 200 \times \frac{125}{100} + 200 \times \frac{135}{100} \right] \sim \left[200 \times \frac{130}{100} + 200 \times \frac{125}{100} + 200 \times \frac{130}{100} \right]$$

$$= [220 + 250 + 270] \sim [260 + 250 + 260] = 30$$

Directions (16-20): Given radar graph shows the number of male & female employees in 4 different companies in a particular year. Study the graph carefully and answer the questions carefully.



Note: (employees = male employees + female employees)

16. Total employees in Fujifilm are what percent of total female employees in all companies?

(a) $41\frac{3}{4}\%$ (b) $43\frac{3}{4}\%$ (c) $41\frac{2}{17}\%$ (d) $41\frac{3}{17}\%$ (e) $43\frac{3}{17}\%$

Sol. (d): Total employees in Fujifilm = 200 + 150 = 350

Total female employees in all companies = 150 + 250 + 300 + 150 = 850

$$\text{Required \%} = \frac{350}{850} \times 100 = 41\frac{3}{17}\%$$

17. Which company has maximum female employee percentage?

(a) Concentrix (b) Optum (c) Adda247 (d) Fujifilm (e) both (a) and (d)

Sol. (b): female % in various companies

$$\text{Fujifilm} = \frac{150}{350} \times 100 = 42\frac{6}{7}\%$$

$$\text{Adda247} = \frac{250}{500} \times 100 = 50\%$$

$$\text{Optum} = \frac{300}{450} \times 100 = 66\frac{2}{3}\%$$

$$\text{Concentrix} = \frac{150}{350} \times 100 = 42\frac{6}{7}\%$$

18. What is the ratio of male employees in Adda247 & Optum together to that of total employees in Concentrix?

(a) 8:1 (b) 1:2 (c) 2:1 (d) 7:8 (e) 8:7

Sol. (e): total male employees in Adda247 & Optum = 250 + 150 = 400

Total employees in Concentrix = 200 + 150 = 350

$$\text{Required ratio} = \frac{400}{350} = 8:7$$

19. If in next year, the male population increases by 10% in both Fujifilm & Adda247 while female population remains same. Find ratio of male employees to female employees in both the offices together.

(a) 99:80 (b) 9:8 (c) 45:44 (d) 11:9 (e) None of these

Sol. (a): no. of male employees in Fujifilm & Adda247 in next year = $(200 + 250) \times \frac{110}{100} = 495$

No. of female employees in both offices in next year = $150 + 250 = 400$

Required ratio = $\frac{495}{400} = 99:80$

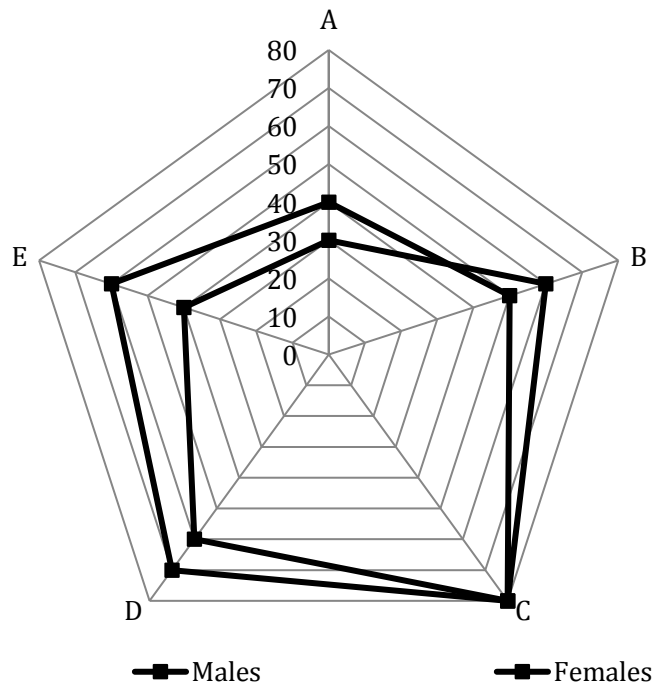
20. Find the total no. of employees in all the offices.

(a) 1575 (b) 1550 (c) 1650 (d) 1725 (e) 1825

Sol. (c): total employees = $(200+150) + (250+250) + (150+300) + (200+150) = 1650$

Practice MCQs for Prelims

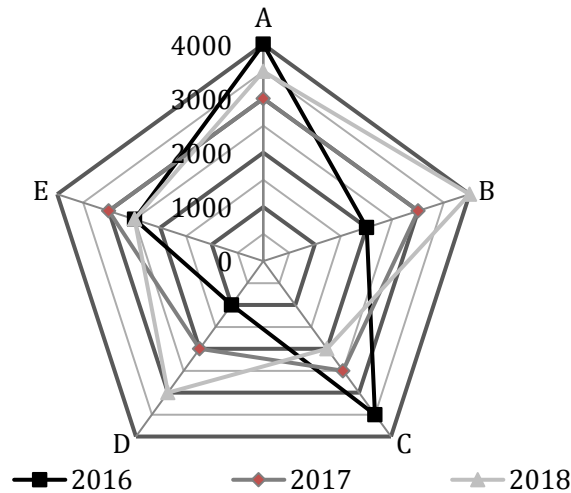
Directions (1-5): Given radar graph shows the data of users (males & females) registered for a trade fair in 5 different slots. Study the data carefully and answer questions.



- Males registered for fair in slots A & C together are what percent more/less than females registered for fair in slots B & D together?
(a) 4% (b) 5% (c) 0% (d) 7% (e) None of these
- What is average number of male users registered for fair in all the slots?
(a) 60 (b) 65 (c) 55 (d) 70 (e) 75
- In which slot, does the maximum no. of users registered for the fair?
(a) A (b) C (c) D (d) B (e) E
- What is average no. of users in all the slots?
(a) 106 (b) 110 (c) 120 (d) 114 (e) 124
- In how many slots, does the percentage of females registered in a slot over all users in same slot is more than 50%?
(a) None (b) 2 (c) 4 (d) 3 (e) 1

Directions (6-10): Study the radar chart given below and answer the following questions.

Radar chart shows the number of buses manufactured by 5 different companies (A, B, C, D & E) in 2016, 2017 & 2018.

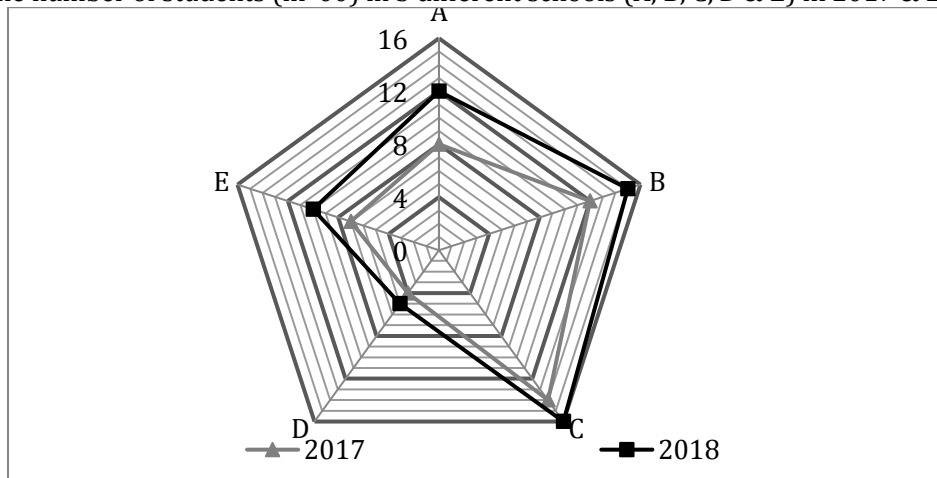


Note – Buses manufactured by a company in any year = (Sold + unsold) buses of that company in that year.

6. If company – B sold 80%, 90% and 80% buses manufactured by it in 2016, 2017 & 2018 respectively, then find average number of unsold buses of company – B in 2016, 2017 & 2018.
 (a) 400 (b) 900 (c) 500 (d) 200 (e) 100
7. Buses manufactured by company – A in 2016 & 2018 together are what percent more or less than buses manufactured by company – D in 2017 & 2018 together?
 (a) 50% (b) 90% (c) 70% (d) 60% (e) 80%
8. If buses sold by company – B and company – E in 2016 are 75% and 80% respectively, then find ratio of buses sold by company – B & E together in 2016 to unsold buses of company – B & E together in 2016.
 (a) 11 : 5 (b) 5 : 1 (c) 8 : 5 (d) 7 : 2 (e) None of the above.
9. Buses manufactured in 2018 by all these 5 companies together are approximately what percent of buses manufactured in 2016 by all these 5 companies together?
 (a) 104% (b) 108% (c) 102% (d) 118% (e) 115%
10. Average number of buses manufactured by company – B, C & D in 2017 are how much more or less than buses manufactured by company – D & E together in 2016?
 (a) 1500 (b) 2500 (c) 2000 (d) 1000 (e) 500

Directions (11-15): Study the radar chart given below and answer the following questions.

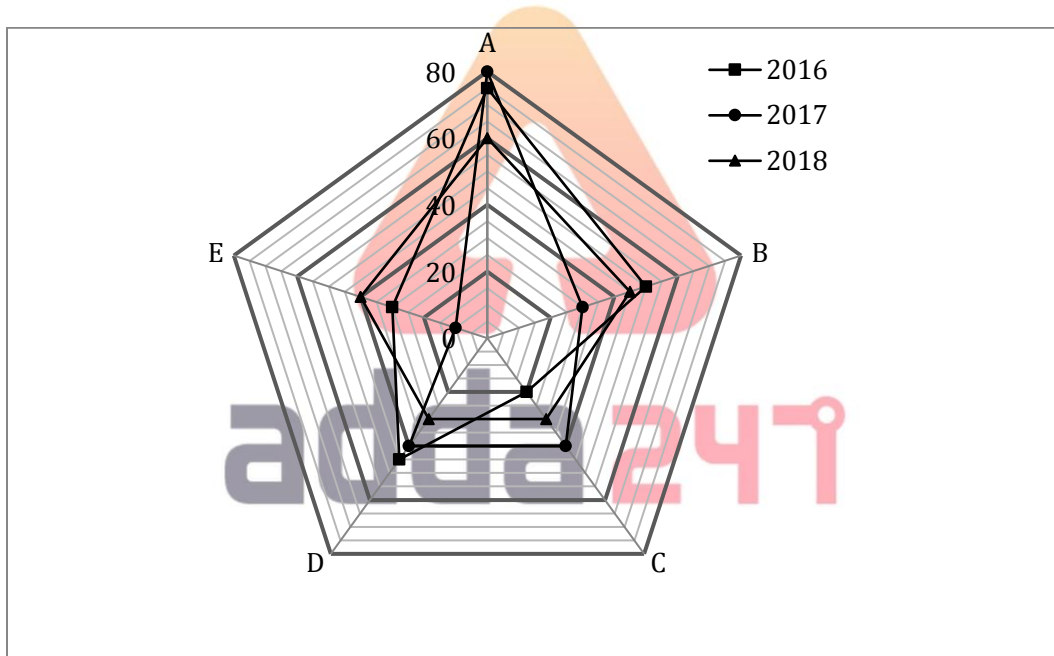
Radar chart shows the number of students (in '00) in 5 different schools (A, B, C, D & E) in 2017 & 2018.



11. Students in A in 2017 & 2018 together are what percent more or less than students in B & E together in 2018?
 (a) 80% (b) 30% (c) 50% (d) 20% (e) 60%
12. If ratio of boys to girls in C in 2017 and 2018 is 3 : 2 and 5 : 3 respectively, then find ratio of number of boys in C in 2017 and 2018 together to total students in B in 2017.
 (a) 7 : 5 (b) 23 : 15 (c) 3 : 2 (d) 21 : 13 (e) 4 : 3
13. Students in C & E together in 2017 are what percent of students in D in 2017 & 2018 together?
 (a) $233\frac{1}{3}\%$ (b) $266\frac{2}{3}\%$ (c) 250% (d) 225% (e) 275%
14. If total students in F in 2017 are 900 more than total students in E in 2017 and ratio of boys to girls in B & F in 2017 is 11 : 9 and 3 : 7 respectively, then find number of girls in B & F together in 2017.
 (a) 1450 (b) 1280 (c) 1340 (d) 1660 (e) None of the above.
15. Average number of students in B, C & D in 2018 are how much more or less than students in A & E together in 2017?
 (a) 100 (b) 200 (c) 300 (d) 500 (e) 400

Directions (16-20): Study the radar chart given below and answer the following questions.

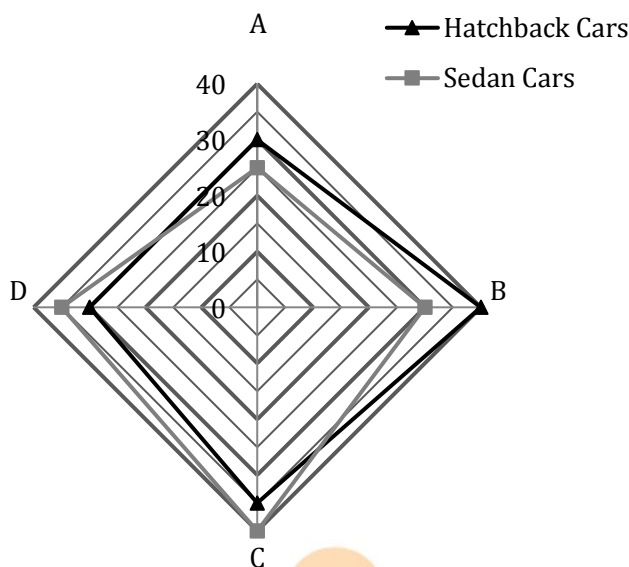
Radar chart shows the number of employees (in '00) in 5 different departments (A, B, C, D & E) of a company in 2016, 2017 & 2018.



16. Average number of employees in A, D & E in 2016 is what percent of employees in A & E together in 2018?
 (a) 40% (b) 20% (c) 80% (d) 50% (e) 90%
17. Find ratio of employees of E in 2016, 2017 & 2018 together to employees in A in 2016 & 2018 together.
 (a) 11 : 15 (b) 16 : 27 (c) 13 : 16 (d) 3 : 4 (e) 2 : 3
18. Employees in company in 2016 are approximately what percent more or less than employees in company in 2018?
 (a) 11% (b) 10% (c) 7% (d) 5% (e) 9%
19. If in 2019 total employees in company are increased by 5% as compared to total employees in company in 2017 and ratio of employees (A : B : C : D : E) in 2019 is 9 : 14 : 5 : 10 : 4, then find total employees in C & D together in 2019 are how much more or less than total employees in B in 2016 & 2017 together.
 (a) 500 (b) 2500 (c) 2000 (d) 1000 (e) 1500
20. Employees in A & B together in 2018 are what percent more or less than employees in C, D & E together in 2017?
 (a) $15\frac{2}{3}\%$ (b) $28\frac{1}{3}\%$ (c) $25\frac{2}{3}\%$ (d) $19\frac{1}{3}\%$ (e) $16\frac{2}{3}\%$

Directions (21-25): Study the given radar graph carefully and answer the following questions.

The given radar graph shows the production data of hatchback & sedan cars by 4 companies (A, B, C & D) in a month.



Note – Total cars produced by any company = Total (hatchback + sedan) cars produced by that company.

21. Find the average no. of hatchback cars produced by all the companies together?

- (a) 32.5 (b) 33.75 (c) 33.5 (d) 38.25 (e) 34.5

22. Total cars produced by company A are what percent of total cars produced by B and C together? (approx.)

- (a) 40% (b) 36% (c) 73% (d) 79% (e) 38%

23. Due to increase in demand of hatchback cars in next month, all companies have to raise their production of hatchback cars by 20% but high prices contributed to a cut in sales of hatchback cars by 20% w.r.t. present month. How many hatchback cars remain unsold if in previous month each company cleared its stock?

- (a) 54 (b) 52 (c) 58 (d) 56 (e) 60

24. Company C marked their sedan cars at Rs. 700000 while D marked the same at Rs. 900000. By what percent income of C from sales of sedan cars is less than that of D? (if both companies sold all their cars)

- (a) $11\frac{1}{9}\%$ (b) $14\frac{2}{7}\%$ (c) 25% (d) $9\frac{1}{9}\%$ (e) $8\frac{1}{3}\%$

25. What is the ratio of sedan cars produced by company C and D together to the hatchback cars produced by B and C together?

- (a) 15:14 (b) 7:8 (c) 8:7 (d) 1:1 (e) 14:15

Practice MCQs for Prelims_(Solutions)

1. (c): males registered for fair in slots A & C = $40 + 80 = 120$

Females registered for fair in slots B & D = $60 + 60 = 120$

$$\text{Required \%} = \frac{120-120}{120} \times 100 = 0\%$$

2. (a): required average = $\frac{40+50+80+70+60}{5} = 60$

3. (b): no. of users registered

$$A = 40 + 30 = 70$$

$$B = 50 + 60 = 110$$

$$C = 80 + 80 = 160$$

$$D = 70 + 60 = 130$$

$$E = 60 + 40 = 100$$

So, Maximum no of users is registered in slot C.

4. (d): required average = $\frac{70+110+160+130+100}{5} = 114$

5. (e): female users percentage

$$A = \frac{30}{70} \times 100 = 42.85\%$$

$$B = \frac{60}{110} \times 100 = 54.54\%$$

$$C = \frac{80}{160} \times 100 = 50\%$$

$$D = \frac{60}{130} \times 100 = 46.15\%$$

$$E = \frac{40}{100} \times 100 = 40\%$$

So, there is only 1 slot in which female is registered more than 50 %

6. (c): Unsold buses of company – B in 2016, 2017 & 2018 together = $\left(2000 \times \frac{20}{100}\right) + \left(3000 \times \frac{10}{100}\right) + \left(4000 \times \frac{20}{100}\right)$
 $= 400 + 300 + 800 = 1500$
 Required average = $\frac{1500}{3} = 500$

7. (a): Buses manufactured by company – A in 2016 & 2018 together = $4000 + 3500 = 7500$
 Buses manufactured by company – D in 2017 & 2018 together = $2000 + 3000 = 5000$
 Required % = $\frac{7500-5000}{5000} \times 100 = 50\%$

8. (d): Buses sold by company – B & E together in 2016 = $\left(2000 \times \frac{75}{100}\right) + \left(2500 \times \frac{80}{100}\right)$
 $= 1500 + 2000 = 3500$
 Unsold buses of company – B & E together in 2016 = $(2000 + 2500) - (3500) = 1000$
 Required ratio = $\frac{3500}{1000} = 7 : 2$

9. (e): Buses manufactured in 2018 by all these 5 companies together = $3500 + 4000 + 2000 + 3000 + 2500 = 15000$
 Buses manufactured in 2016 by all these 5 companies together = $4000 + 2000 + 3500 + 1000 + 2500 = 13000$
 Required % = $\frac{15000}{13000} \times 100 = 115.38\%$
 $= 115\%$ (approx.)

10. (d): Average number of buses manufactured by company – B, C & D in 2017 = $\frac{3000+2500+2000}{3} = 2500$
 Buses manufactured by company – D & E together in 2016 = $1000 + 2500 = 3500$
 Required difference = $3500 - 2500 = 1000$

11. (d): Students in A in 2017 & 2018 together = $800 + 1200 = 2000$
 Students in B & E together in 2018 = $1500 + 1000 = 2500$
 Required % = $\frac{2500-2000}{2500} \times 100 = 20\%$

12. (b): Number of boys in C in 2017 and 2018 together = $\left(1400 \times \frac{3}{5}\right) + \left(1600 \times \frac{5}{8}\right)$
 $= 840 + 1000 = 1840$
 Required ratio = $\frac{1840}{1200} = 23 : 15$

13. (a): Students in C & E together in 2017 = $1400 + 700 = 2100$
 Students in D in 2017 & 2018 together = $400 + 500 = 900$
 Required % = $\frac{2100}{900} \times 100 = 233\frac{1}{3}\%$

14. (d): Total students in F in 2017 = $900 + 700 = 1600$
 Number of girls in F = $1600 \times \frac{7}{10} = 1120$
 Number of girls in B = $1200 \times \frac{9}{20} = 540$
 So, required number of girls = $1120 + 540 = 1660$

15. (c): Average number of students in B, C & D in 2018 = $\frac{1}{3} \times (1500 + 1600 + 500) = 1200$
 Students in A & E together in 2017 = $800 + 700 = 1500$
 Required difference = $1500 - 1200 = 300$

16. (d): Average number of employees in A, D & E in 2016 = $\frac{7500+4500+3000}{3} = 5000$
 Employees in A & E in 2018 = $6000 + 4000 = 10000$
 Required % = $\frac{5000}{10000} \times 100 = 50\%$

17. (b): Employees in E in 2016, 2017 & 2018 together = $3000 + 1000 + 4000 = 8000$
 Employees in A in 2016 & 2018 together = $7500 + 6000 = 13500$
 Required ratio = $\frac{8000}{13500} = 16 : 27$

18. (c): Employees in company in 2016 = $7500 + 5000 + 2000 + 4500 + 3000 = 22000$
 Employees in company in 2018 = $6000 + 4500 + 3000 + 3000 + 4000 = 20500$
 Required % = $\frac{22000-20500}{20500} \times 100 = 7.31\% = 7\%$ approx.

- 19. (a):** Total employees in company in 2019 = $\frac{105}{100} \times (8000 + 3000 + 4000 + 4000 + 1000)$
 $= 21000$
 ATQ,
 Total employees in C & D together in 2019 = $21000 \times \frac{5+10}{9+14+5+10+4}$
 $= 7500$
 Total employees in B in 2016 & 2017 together = $5000 + 3000$
 $= 8000$
 Required difference = $8000 - 7500$
 $= 500$
- 20. (e):** Employees in A & B together in 2018 = $6000 + 4500$
 $= 10500$
 Employees in C, D & E together in 2017 = $4000 + 4000 + 1000$
 $= 9000$
 Required % = $\frac{10500-9000}{9000} \times 100$
 $= 16\frac{2}{3}\%$

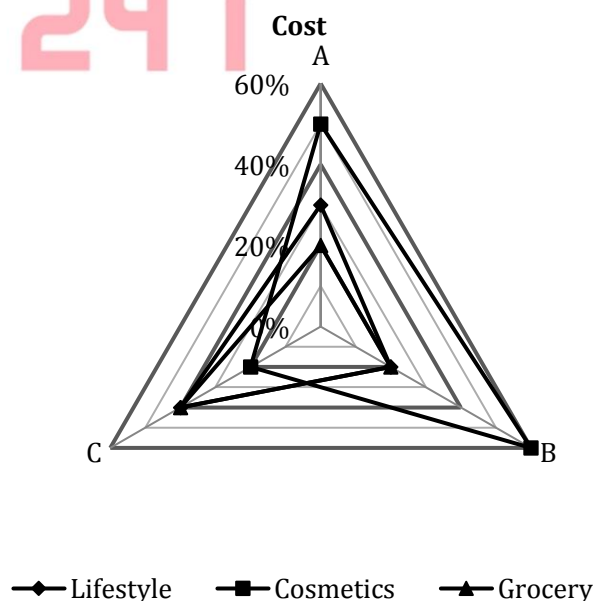
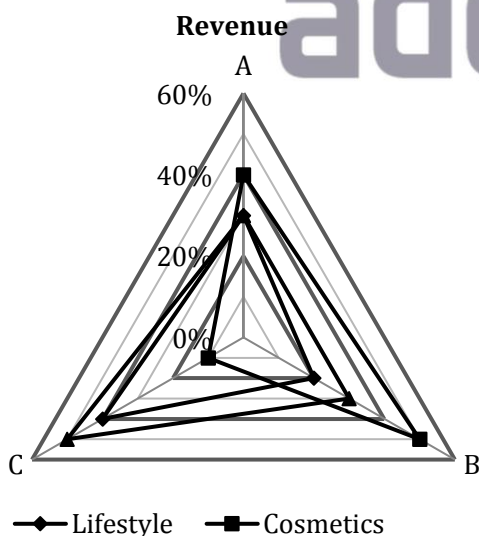
Solutions (21-25):

- 21. (b):** Required average = $\frac{30+40+35+30}{4} = 33.75$
- 22. (e):** Total cars by A = $30+25 = 55$
 Total cars by B & C together = $40 + 30 + 35 + 40 = 145$
 Required % = $\frac{55}{145} \times 100 = 37.93\% \approx 38\%$
- 23. (a):** Total production of hatchback cars in next month = $(30 + 40 + 35 + 30) \times \frac{120}{100} = 162$
 Total sales = $(30 + 40 + 35 + 30) \times \frac{80}{100} = 108$
 Unsold cars in next month = $162 - 108 = 54$
- 24. (a):** Total revenue from sales of sedan cars of company C = $40 \times 7 \text{ lakh} = \text{Rs. } 280 \text{ lakh}$
 Total revenue from sales of sedan cars of company D = $35 \times 9 \text{ lakh} = \text{Rs. } 315 \text{ lakh}$
 Required % = $\frac{315-280}{315} \times 100 = 11\frac{1}{9}\%$
- 25. (d):** Required ratio = $\frac{40+35}{40+35} = 1:1$

Practice MCQs for Mains

Directions (1-5): Study the radar charts carefully and answer the following questions.

There are three stores (A, B & C) which deal in 3 segments (Lifestyle, Cosmetics & Grocery) only. Radar charts shows percentage contribution of each segment in total revenue and total cost of that store. Ratio of total cost of store – A, B & C is 16 : 40 : 25 respectively.



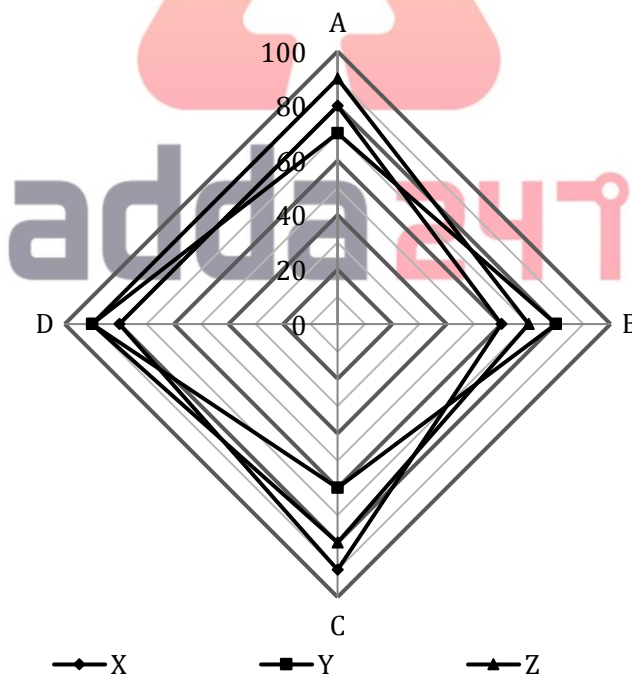
Note – 1. Profit = Revenue – Cost

2. Profit % = $\frac{\text{Profit}}{\text{Cost}} \times 100$

- Profit earned by store – B in Lifestyle is Rs.4000 more than that earned by store – A in Lifestyle and ratio of revenue of Grocery of store – A to revenue of Grocery of store – B is 2 : 5. If cost of Cosmetics of store – C is Rs.25000, then find overall profit percentage of store – A.
(a) 35% (b) 30% (c) 40% (d) 25% (e) 20%
- Revenue of store – C from Grocery is Rs.95000 more than revenue of store – B from Cosmetics and revenue of store – C from Cosmetics is $9\frac{3}{8}\%$ more than revenue of store – B from Lifestyle, then find total revenue of store – B & C together.
(a) Rs.510000 (b) Rs.440000 (c) Rs.580000 (d) Rs.550000 (e) Rs.470000
- Average cost of cosmetics for store – A, B & C is Rs.37000 and total revenue of store – A is Rs.40,000 less than total revenue of store – B. If profit earned by store – A in Lifestyle is Rs.9600, then find profit/loss percentage earned by store – B on Cosmetics and Grocery together.
(a) 100% (b) 50% (c) 70% (d) 30% (e) 0%
- Revenue of store – A & C together from Lifestyle is Rs.70500 and overall profit percentage of store – A & store – C is $17\frac{3}{16}\%$ and 20% respectively, then find total cost of store – B & C together.
(a) Rs.180000 (b) Rs.300000 (c) Rs.260000 (d) Rs.220000 (e) Rs.200000
- Revenue of store – B & C together from Lifestyle is Rs.76800 and revenue of store – B & C together from Grocery is Rs.99200. Find total revenue of store – B is how much more or less than total revenue of store – C?
(a) Rs.84000 (b) Rs.110000 (c) Rs.64000 (d) Rs.96000 (e) Rs.60000

Directions (6-9): Study the radar chart given below and answer the following questions.

Radar chart shows the percentage of 3 different products (X, Y & Z) sold by 4 different companies (A, B, C & D) in 2018.



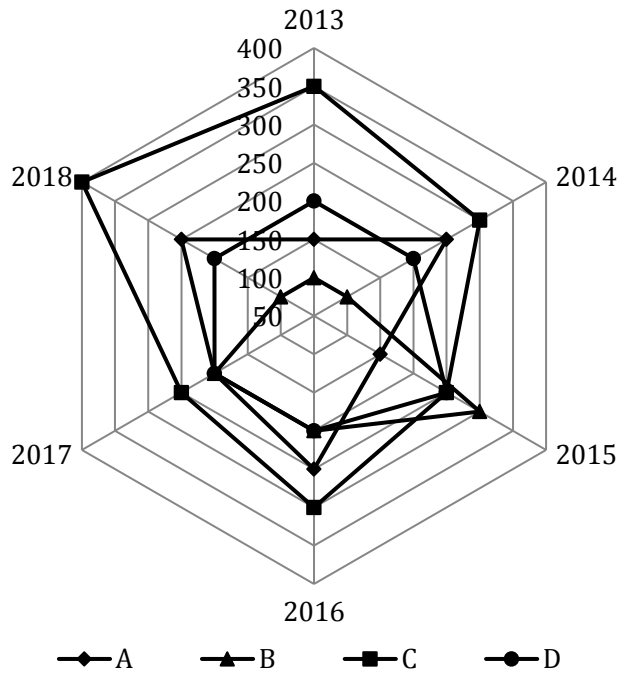
Note – Total units manufactured of any product by any company = Total (sold + unsold) units of that product of that company.

- If unsold units of product – Y of company – C is 80% of unsold units of product – X of company – A and ratio of units manufactured of product – X, Y & Z by company – A & C is 5 : 3 : 4 and 3 : 2 : 6 respectively, then find sold units of product – Y & Z together of company – A are what percent of sold units of product – X & Z together of company – C?
(a) 90% (b) 54% (c) 76% (d) 68% (e) 58%

7. If average of unsold units of product – X, Y & Z of company – D is 400 units and ratio of total units manufactured of product – X, Y & Z of company – D & company – B is 4 : 1 : 3 & 3 : 5 : 6 respectively, then find total units manufactured of product – X, Y & Z by company – B & D together. (Ratio of sold units of product – Y of company – B to that of company – D is 20 : 9).
 (a) 19000 units (b) 11000 units (c) 24000 units (d) 17000 units (e) 15000 units
8. If ratio of sold units of product – Z of company – A to that of company – C is 3 : 2 and ratio of total units manufactured of product – X, Y & Z by company – A & C is 5 : 2 : 4 & 2 : 5 : 6 respectively, then find sold units of product – Y of company – C is what percent of sold units of product – X of company – A?
 (a) 54.5% (b) 37.5% (c) 45.5% (d) 43.5% (e) 58.5%
9. If ratio of product – X sold by company – A, B, C & D is 16 : 9 : 9 : 15 respectively and average units of product – X sold by company – A, B, C & D is 4900 units, then find average of unsold units of product – X of company – A & C is how much less than unsold units of product – X of company – B & D together?
 (a) 2900 units (b) 2500 units (c) 3600 units (d) 2300 units (e) 2800 units

Directions (10-14): Answer the questions based on the information given below.

Sales (by volume) of a product by four different companies (in lakh units)



Revenue = Sales (by volume) × Selling price of each product

Profit = Revenue – Expenditure

Profit percent = $\frac{\text{Revenue} - \text{Expenditure}}{\text{Expenditure}} \times 100$

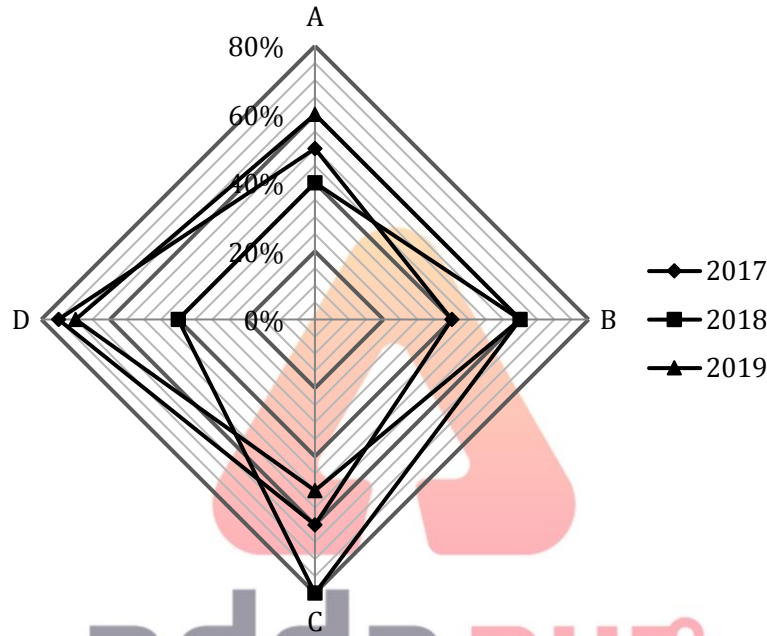
10. The market share of a company is defined as the volume of the sales of the company as a percentage of the total sales volume of all the four given companies. In which year was the market share of company C the highest?
 (a) 2018 (b) 2015 (c) 2013 (d) 2016 (e) 2017
11. In the year 2017, if the profit percent on selling a product by company A is 25%, and the selling price of each product is Rs. 10, what was the expenditure incurred by company A in making these products?
 (a) Rs. 12 cr (b) Rs. 14 cr (c) Rs. 16 cr (d) Rs. 10 cr (e) none of these
12. In the year 2016, the expenditures of company A, B, C and D are in ratio 3: 2: 6: 8. Which company had the highest profit percentage in 2016?
 (a) A (b) C (c) D
 (d) Cannot be determined (e) none of these

13. Which company had the highest growth rate for the period 2013 to 2017?
 (a) B (b) A (c) D (d) C (e) none of these
14. Total sales (by volume) of company A from 2014 to 2017 are what percent more/less than the total sales (by volume) of company D from 2015 to 2018?
 (a) 100% (b) 50% (c) 150% (d) 200% (e) none of these

Directions (15-19): Study the radar chart given below and answer the following questions.

Radar chart shows the percentage of wheat produced by 4 different states (A, B, C & D) in 2017, 2018 & 2019. These 4 states produce wheat & rice only.

% of rice produced by a particular state in any year = total production of wheat and rice together by that state in that year
 - % of wheat produced by the same state in same year.

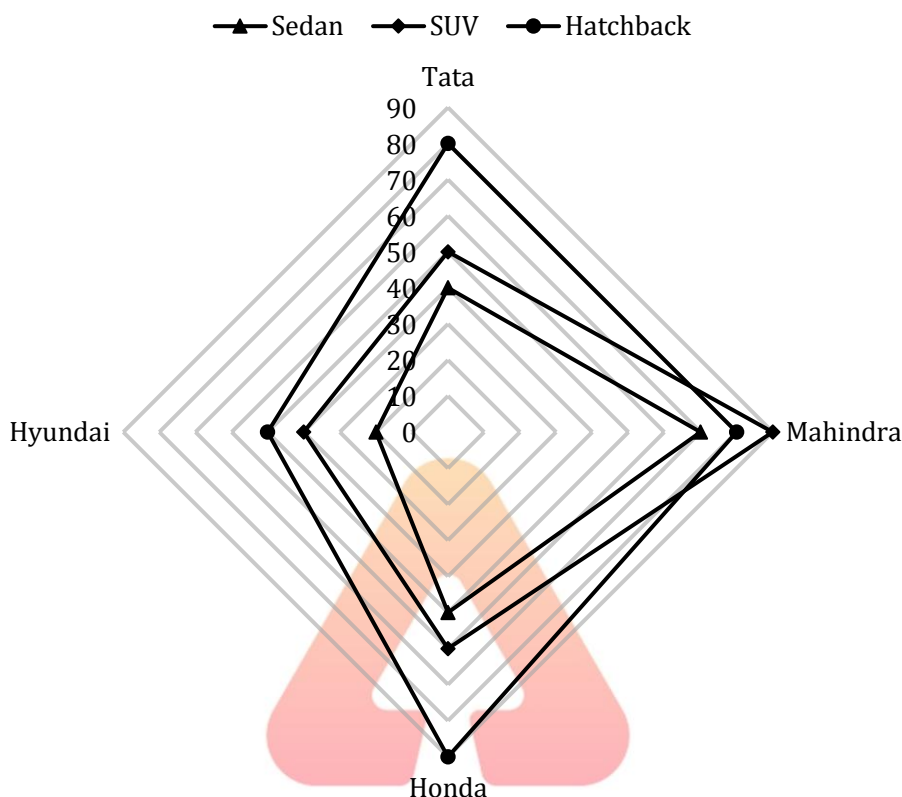


15. Total production of wheat & rice together by B in 2017 is equal to total production of wheat and rice together by A in 2019. Production of rice by D in 2019 is 20% less than total production of wheat & rice together by A in 2019. Total production of rice by A and D together in 2019 is what percent of production of rice by B in 2017 ?
 (a) 160% (b) 150% (c) 250% (d) 200% (e) 240%
16. Production of wheat by A in 2018 is equal to production of wheat by A in 2017. Production of rice by B in 2018 is 50% of production of rice by A in 2017. What is the total production of wheat & rice together by A in 2017 and 2018 together? (Production of wheat by B in 2018 is 3000 kg)
 (a) 15000 kg (b) 18000 kg (c) 12000 kg (d) 20000 kg (e) 16000 kg
17. Average of total production of rice of C & D in 2017 is 6000 kg and total production of rice & wheat together by C in 2017 is 25% more than total production of rice & wheat together by D in 2017. If production of rice by C in 2018 to production of rice by D in 2017 is 3 : 2, then what is the total production of wheat by C in 2017 & 2018 together?
 (a) 30000 kg (b) 36000 kg (c) 32000 kg (d) 35000 kg (e) 28000 kg
18. Total production of wheat & rice together by C in 2019 is 32000 kg. Total production of wheat & rice together by D in 2019 is 8000 kg more than that of by C in 2019. Total production of rice by C & D together in 2019 are how many more/less than total production of wheat by C & D together in 2019?
 (a) 16000 kg (b) 20000 kg (c) 15000 kg (d) 12000 kg (e) 10000 kg
19. Total production of rice by B & C together in 2018 is 14000 kg. Production of wheat by B in 2018 is 34000 kg less than production of wheat by C in 2018. What is the sum of total production of rice & wheat together by B and C together in 2018?
 (a) 20000 kg (b) 30000 kg (c) 50000 kg (d) 40000 kg (e) 60000 kg

Directions (20-25): Study the radar chart given below and answer the following questions.

Radar chart shows the number of sedans, SUV and Hatchback cars sold (in '00) by 4 different car manufacturers (Tata, Hyundai, Mahindra and Honda).

Note – All companies sell only 3 types of cars – Sedan, SUV and Hatchback.



20. Total sedan sold by Tata and Honda together are what percent more or less than total SUV sold by Honda and Hyundai together?
 (a) 50% (b) 40% (c) 30% (d) 10% (e) 20%
21. SUV cars sold by Tata and Maruti are equal. Sedan cars sold by Maruti are 300% more than Sedan cars sold by Hyundai. Hatchback cars sold by Maruti are 12.5% less than hatchback cars sold by Mahindra. Total cars sold by Maruti are how many more or less than total cars sold by Tata?
 (a) 7000 (b) 1000 (c) 5000 (d) 4000 (e) 3000
22. Average of total Hatchback cars sold by Tata, Mahindra and Hyundai are how many more or less than the average of Sedan, SUV and Hatchback cars sold by Mahindra?
 (a) 1000 (b) 5000 (c) 2000 (d) 3000 (e) 4000
23. If ratio of sold to unsold sedan cars for Honda is 5:4 and ratio of unsold sedan cars, unsold SUV cars and unsold Hatchback cars is 2:2:1 for Honda, then total cars sold by Honda are what percent of total cars manufactured by Honda?
 (a) $33\frac{1}{3}\%$ (b) $47\frac{2}{3}\%$ (c) $66\frac{2}{3}\%$ (d) $54\frac{1}{3}\%$ (e) $75\frac{1}{3}\%$
24. What is the ratio of total cars sold by Tata to total cars sold by Hyundai?
 (a) 3:2 (b) 5:4 (c) 17:11 (d) 15:13 (e) None of the above.
25. Total SUV sold by Toyota is 20% more than average number of SUV sold by Honda and Tata, while ratio of total sedan to total Hatch back sold by Toyota is 11 : 10. If average of total three types of car sold by Toyota is 5000, then find the total sedan sold by Toyota?
 (a) 6600 (b) 2200 (c) 5500 (d) 4400 (e) 3300

Practice MCQs for Mains_(Solutions)

Sol (1-5):

Let total cost of store – A, B & C be Rs.1600x, Rs.4000x & Rs.2500x respectively.

Stores	Lifestyle	Cosmetics	Grocery
A	480x	800x	320x
B	800x	2400x	800x
C	1000x	500x	1000x

Let total revenue of store – A, B & C be 100a, 100b & 100c respectively.

Stores	Lifestyle	Cosmetics	Grocery
A	30a	40a	30a
B	20b	50b	30b
C	40c	10c	50c

1. (d): ATQ,

$$500x = 25000$$

$$\Rightarrow x = 50$$

$$\text{Now, } \frac{30a}{30b} = \frac{2}{5}$$

$$\Rightarrow a : b = 2 : 5$$

$$\Rightarrow b = 2.5a$$

$$\text{Now, } (20b - 800x) - (30a - 480x) = 4000$$

$$\Rightarrow 2b - 3a - 32x = 400 \quad \dots(ii)$$

Put value of x in (ii):

$$2b - 3a - 1600 = 400$$

$$\Rightarrow 2b - 3a = 2000 \quad \dots(iii)$$

Put value of b in (iii):

$$5a - 3a = 2000$$

$$\Rightarrow a = 1000$$

$$\text{So, } b = 2500$$

$$\text{Now, total cost of store – A} = 1600x$$

$$= \text{Rs.}80000$$

$$\text{And, total revenue of store – A} = 100a$$

$$= \text{Rs.}100000$$

$$\text{Required profit \%} = \frac{100000 - 80000}{80000} \times 100$$

$$= 25\%$$

2. (a): ATQ,

$$\frac{10c - 20b}{20b} = \frac{75}{800}$$

$$\Rightarrow \frac{2c - 4b}{b} = \frac{3}{8}$$

$$\Rightarrow c = \frac{35b}{16} \quad \dots(i)$$

Now,

$$50c - 50b = 95000$$

$$\Rightarrow (c - b) = 1900 \quad \dots(ii)$$

On solving (i) & (ii), we get:

$$b = 1600, c = 3500$$

$$\text{Required revenue} = 100b + 100c$$

$$= \text{Rs.}510000$$

3. (e): ATQ,

$$\frac{800x + 2400x + 500x}{3} = 37000$$

$$\Rightarrow x = 30$$

$$\text{Now, } 30a - 480x = 9600 \quad \dots(i)$$

Put value of x in (i):

$$a = 800$$

$$\text{And, } 100b - 100a = 40000$$

$$b - a = 400 \quad \dots(ii)$$

Put value of a in (ii):

$$b = 1200$$

$$\text{Revenue of store – B on Cosmetics and Grocery together} = 50b + 30b$$

$$= 80b$$

$$= \text{Rs.}96000$$

$$\text{Cost of store – B on Cosmetics and Grocery together} = 2400x + 800x$$

$$= 3200x$$

$$= \text{Rs.}96000$$

$$\text{Required profit \%} = \frac{96000 - 96000}{96000} \times 100$$

$$= 0\%$$

4. (c): ATQ,

$$\frac{100a - 1600x}{1600x} = \frac{275}{1600}$$

$$\Rightarrow 100a = 1875x$$

$$\Rightarrow a = 18.75x$$

$$\text{And, } \frac{100c - 2500x}{2500x} = \frac{20}{100}$$

$$\Rightarrow c = 30x$$

$$\text{Now, } 30a + 40c = 70500$$

$$3a + 4c = 7050 \quad \dots(i)$$

Put value of a & c in (i):

$$56.25x + 120x = 7050$$

$$\Rightarrow x = 40$$

$$\text{Required cost} = 4000x + 2500x$$

$$= 6500x$$

$$= \text{Rs.}260000$$

5. (d): ATQ,

$$20b + 40c = 76800$$

$$\Rightarrow b + 2c = 3840 \quad \dots(i)$$

$$\text{Now, } 30b + 50c = 99200$$

$$\Rightarrow 3b + 5c = 9920 \quad \dots(ii)$$

On solving (i) & (ii), we get:

$$c = 1600, b = 640$$

$$\text{Required difference} = 100c - 100b$$

$$= \text{Rs.}96000$$

6. (c): Let total units manufactured of product - Y of company - C and that of product - X of company - A be $2x$ and $5y$ units respectively.

ATQ,

$$2x \times \frac{40}{100} = \frac{80}{100} \left(5y \times \frac{20}{100} \right)$$

$$x = y$$

Sold units of product - Y of company

$$- A = 3y \times \frac{70}{100} = \frac{21}{10}y$$

Sold units of product - Z of company

$$- A = 4y \times \frac{90}{100} = \frac{36}{10}y$$

Sold units of product - X of company

$$- C = 3x \times \frac{90}{100} = \frac{27}{10}x$$

Sold units of product - Z of company

$$- C = 6x \times \frac{80}{100} = \frac{48}{10}x$$

$$\text{Required \%} = \frac{\left(\frac{21}{10}y + \frac{36}{10}y \right)}{\frac{27}{10}x + \frac{48}{10}x} \times 100 = 76\%$$

7. (e): Let total units manufactured of product - X, Y & Z of company - D be $400x$ units, $100x$ units & $300x$ units respectively.

ATQ,

$$\frac{1}{3} \times \left(\left(400x \times \frac{20}{100} \right) + \left(100x \times \frac{10}{100} \right) + \left(300x \times \frac{10}{100} \right) \right) = 400$$

$$\frac{1}{3} \times (80x + 10x + 30x) = 400$$

$$\Rightarrow x = 10$$

Total units manufactured of product - X, Y & Z by company - D = $(400x + 100x + 300x)$

$$= 800 \times 10$$

$$= 8000 \text{ units}$$

Sold units of product - Y of company - B =

$$100 \times 10 \times \frac{90}{100} \times \frac{20}{9}$$

$$= 2000 \text{ units}$$

Total units manufactured of product -Y by company - B = $2000 \times \frac{100}{80}$

$$= 2500 \text{ units}$$

Total units manufactured of product - X, Y & Z by company - B = $2500 \times \frac{14}{5}$

$$= 7000 \text{ units}$$

$$\text{Required number of units} = 8000 + 7000$$

$$= 15000 \text{ units}$$

8. (b): Let total units manufactured of product - Z of company - A & C be $4x$ & $6y$ units respectively.

$$\text{ATQ, } \frac{4x \times \frac{90}{100}}{6y \times \frac{80}{100}} = \frac{3}{2}$$

$$x : y = 2 : 1$$

$$\text{Required \%} = \frac{5y \times \frac{60}{100}}{5x \times \frac{80}{100}} \times 100$$

$$= 37.5\%$$

9. (a): Let units of product - X sold by company - A, B, C & D be $160p$ units, $90p$ units, $90p$ units & $150p$ units respectively.

ATQ,

$$\frac{160p + 90p + 90p + 150p}{4} = 4900$$

$$\Rightarrow p = 40$$

Unsold units of product - X sold by company

$$- A = 160 \times 40 \times \frac{20}{80}$$

$$= 1600 \text{ units}$$

Unsold units of product - X sold by company

$$- B = 90 \times 40 \times \frac{40}{60}$$

$$= 2400 \text{ units}$$

Unsold units of product - X sold by company

$$- C = 90 \times 40 \times \frac{10}{90}$$

$$= 400 \text{ units}$$

Unsold units of product - X sold by company

$$- D = 150 \times 40 \times \frac{20}{80}$$

$$= 1500 \text{ units}$$

$$\text{Required difference} = (2400 + 1500) - \frac{(1600 + 400)}{2}$$

$$= 2900 \text{ units}$$

10. (c): By observation we can say that the sales volume of company C is more in 2013 compared to 2014 and also 2017 and total sales volume is less or equal in 2013 compared to 2014 and 2017. So, the market share of company C is not the highest for years 2014 and 2017. In the same way the market share of company C is not the highest in 2016.

$$\text{In the year 2013, market share of company C} = \frac{350}{800} \times 100 = 43.75\%$$

$$\text{In the year 2018, market share of company C} = \frac{400}{950} \times 100 = 42.11\%$$

So, market share is the highest in 2013.

11. (c): C.P. price of each product sold in 2017 by company

$$A = \frac{10}{125} \times 100 = \text{Rs. } 8$$

$$\text{Expenditure of company} = 8 \times 200 \times 10^5 = 16 \text{ cr.}$$

12. (d): We need the sales revenue and expenditure. Now we do not know the sales revenue as selling prices of the product are not known. We cannot answer the question.

13. (a): By observation we can say that the sales of B in year 2017 are two times the sales of 2013, but for other companies, it is less than double. So the average annual growth rate is the highest for company B from year 2013 to 2017.

$$14. (e): \text{Required percent} = \frac{850 - 850}{850} \times 100 = 0\%$$

- 15. (d):** Let total production of wheat & rice together by B in 2017 be $100x$ kg.
 So, total production of wheat & rice together by A in 2019 = $100x$ kg
 And, production of rice by D in 2019 = $100x \times \frac{80}{100}$
 = $80x$ kg
 Now, production of rice by A in 2019 = $100x \times \frac{100-60}{100}$
 = $40x$ kg
 And, production of rice by B in 2017 = $100x \times \frac{100-40}{100}$
 = $60x$ kg
 Required % = $\frac{80x+40x}{60x} \times 100$
 = 200%

16. (b): ATQ,

- Production of rice by B in 2018 = $3000 \times \frac{40}{60}$
 = 2000 kg
 Production of rice by A in 2017 = $2000 \times \frac{100}{50}$
 = 4000 kg
 Production of wheat by A in 2017 = $4000 \times \frac{50}{50}$
 = 4000 kg
 So, production of wheat by A in 2018 = 4000 kg.
 Production of rice by A in 2018 = $\frac{4000}{40} \times 60 = 6000$ kg.
 Required quantity = $4000 + 4000 + 4000 + 6000$
 = 18000 kg

- 17. (b):** Let total production of rice & wheat together by D in 2017 be $100x$ kg.
 So, total production of rice & wheat together by C in 2017 = $100x \times \frac{125}{100}$
 = $125x$ kg
 ATQ,
 $125x \times \frac{100-60}{100} + 100x \times \frac{100-75}{100} = 12000$
 $x = 160$
 Now, production of rice by C in 2018 = $100 \times 160 \times \frac{100-75}{100} \times \frac{3}{2}$
 = 6000 kg
 Required production of wheat = $125 \times 160 \times \frac{60}{100} + 6000 \times \frac{80}{100-80}$
 = 12000 + 24000
 = 36000 kg

- 18. (a):** Total production of wheat & rice together by D in 2019 = $32000 + 8000$
 = 40000 kg
 So, production of rice by C & D together in 2019 = $\left(32000 \times \frac{100-50}{100}\right) + \left(40000 \times \frac{100-70}{100}\right)$

$$= 16000 + 12000$$

$$= 28000 \text{ kg}$$

And, production of wheat by C & D together in 2019 = $(32000 + 40000) - 28000$
 = 44000 kg
 Required difference = $44000 - 28000$
 = 16000 kg

- 19. (e):** Let total production of rice & wheat together by B in 2018 be $100x$ kg.
 Let total production of rice & wheat together by C in 2018 be $100y$ kg.

ATQ,
 $\left(100x \times \frac{100-60}{100}\right) + \left(100y \times \frac{100-80}{100}\right) = 14000$
 $40x + 20y = 14000$
 $2x + y = 700 \quad \dots(i)$
 Also, $\left(100y \times \frac{80}{100}\right) - \left(100x \times \frac{60}{100}\right) = 34000$
 $80y - 60x = 34000$
 $4y - 3x = 1700 \quad \dots(ii)$
 On solving (i) & (ii), we get
 $x = 100, y = 500$
 Required sum = $100x + 100y$
 = $100(100 + 500)$
 = 60000 kg

- 20. (d):** Total sedan sold by Tata and Honda together = $4000 + 5000$
 = 9000
 Total SUV sold by Honda and Hyundai together = $6000 + 4000 = 10000$
 Required % = $\frac{(10000-9000)}{10000} \times 100 = 10\%$

- 21. (e):** Total cars sold by Maruti
 = $5000 + \left(\frac{400}{100} \times 2000\right) + \left(\frac{87.5}{100} \times 8000\right)$
 = $5000 + 8000 + 7000 = 20000$
 Total cars sold by Tata = $4000 + 5000 + 8000$
 = 17000
 Required difference = $20000 - 17000 = 3000$

- 22. (a):** Average of Hatchback cars sold by Tata, Mahindra and Hyundai = $\frac{8000+8000+5000}{3} = 7000$
 Average of sedan, SUV and Hatchback cars sold by Mahindra = $\frac{7000+9000+8000}{3} = 8000$
 Required difference = $8000 - 7000 = 1000$

23. (c): ATQ,

Unsold sedan cars of Honda = $5000 \times \frac{4}{5} = 4000$
 Unsold SUV cars of Honda = $4000 \times \frac{2}{2} = 4000$
 And, unsold Hatchback cars of Honda = $4000 \times \frac{1}{2} = 2000$
 Now, total cars sold by Honda = $5000 + 6000 + 9000 = 20000$

Total cars manufactured by Honda = 20000 + 4000 + 4000 + 2000 = 30000

Required % = $\frac{20000}{30000} \times 100 = 66\frac{2}{3}\%$

24. (c): Total cars sold by Tata = (4000 + 5000 + 8000) = 17000

Total cars sold by Hyundai = (2000 + 4000 + 5000) = 11000

Required ratio = $\frac{17000}{11000} = 17:11$

25. (d): Total SUV sold by Toyota = $\frac{1}{2} \times (6000 + 5000) \times \frac{120}{100} = 6600$

Let total sedan and total Hatch back sold by Toyota be 11x & 10x respectively

ATQ –

$6600 + 11x + 10x = 5000 \times 3$

$21x = 8400$

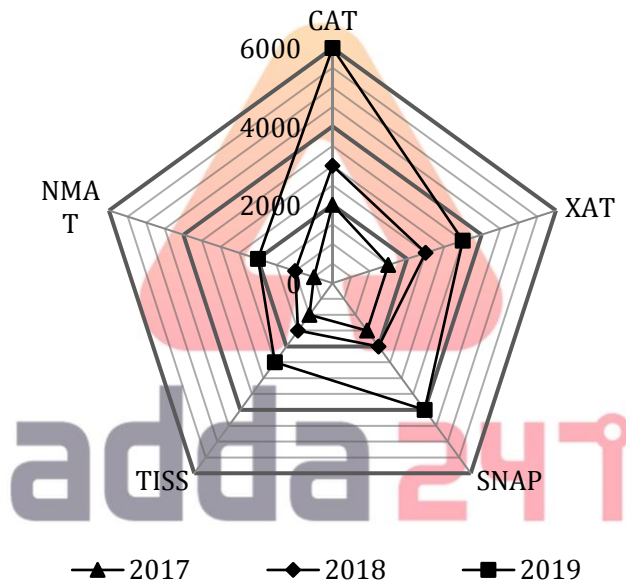
$x = 400$

So, total sedan sold by Toyota = $11 \times 400 = 4400$

Previous Years' Questions of Prelims

Directions (1-5): Study the radar graph given below and answer the following questions.

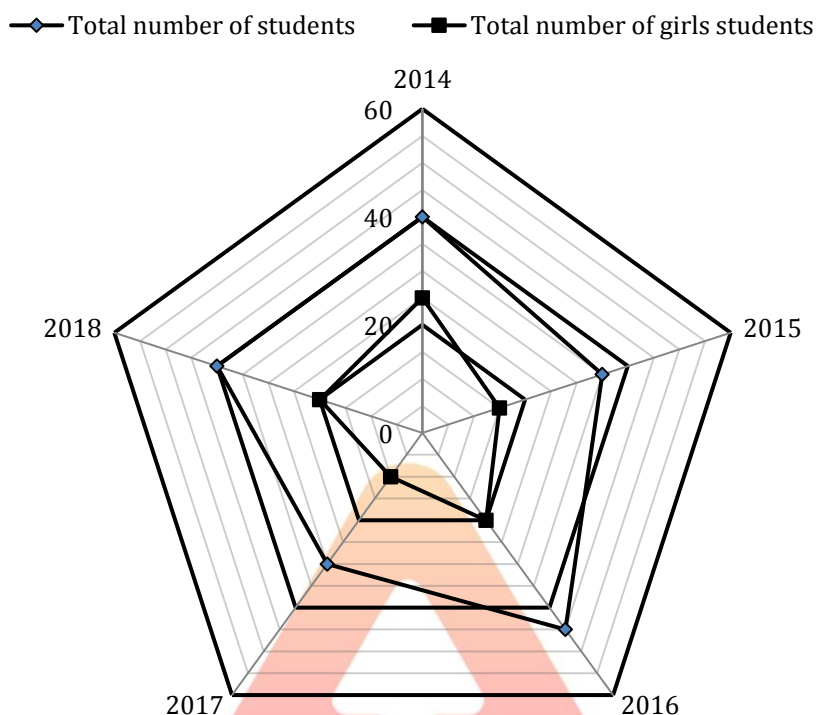
Radar graph shows the number of books sold of 5 different entrance exams (CAT, XAT, SNAP, TISS & NMAT) in 2017, 2018 & 2019.



- Books sold of CAT in 2018 & 2019 together are what percent more or less than average of books sold of CAT, XAT & TISS in 2017?
(a) 900% (b) 200% (c) 500% (d) 100% (e) 700%
- Average of books sold of XAT in 2017, 2018 & 2019 are how much more/less than books sold of NMAT in 2017 & 2018 together?
(a) 1000 (b) 600 (c) 1300 (d) 1600 (e) 1200
- Find ratio of books sold of SNAP in 2017, 2018 & 2019 together to books sold of TISS in 2018 & 2019 together.
(a) 5 : 2 (b) 2 : 5 (c) 8 : 15 (d) 4 : 7 (e) 15 : 8
- If books sold of CAT in 2020 is increased by 475% as compared to books sold of CAT in 2017 and books sold of NMAT in 2020 is increased by 40% as compared to books sold of NMAT in 2019, then find books sold of CAT & NMAT together in 2020.
(a) 15400 (b) 14300 (c) 17600 (d) 12100 (e) 14800
- Find percentage change in total books sold of all 5 exams in 2019 together as compared to total books sold of all 5 exams together in 2017.
(a) $165\frac{8}{13}\%$ (b) $192\frac{6}{13}\%$ (c) $183\frac{10}{13}\%$ (d) $176\frac{12}{13}\%$ (e) None of the above.

Directions (6-10): Study the radar chart given below and answer the following questions.

Radar chart shows the total number of students (in '00) of a school during 5 different years and also shows total number of girl students (in '00) in the school in these 5 years.



Note – Total number of students in the school in any year = Total number of (girls + boys) students in the school in that year.

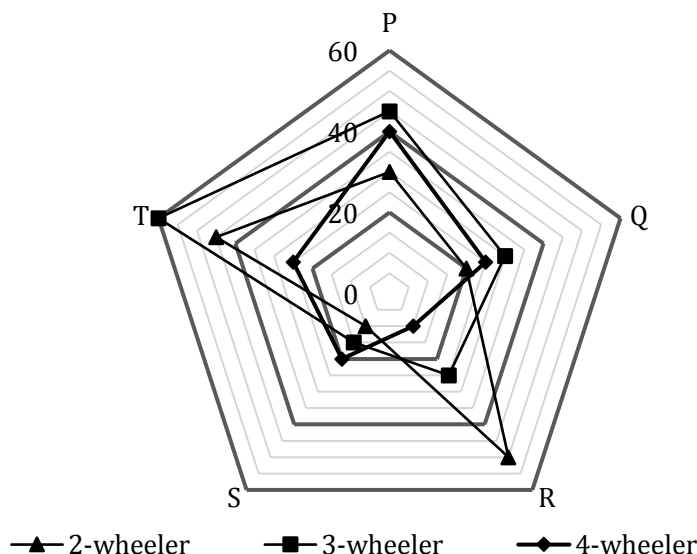
6. Total number of students in the school in 2017 is what percentage more or less than the number of boy's students in the school in 2016?
 (a) 20% (b) 15% (c) 18% (d) 12% (e) 22%
7. Average number of girls' students in the school in 2014 & 2015 is how much more or less than number of boys' students in the school in 2016?
 (a) 800 (b) 600 (c) 500 (d) 450 (e) 520
8. Find the ratio of the number of girls in the school in 2017 & 2018 together to total number of students in the school in 2014 respectively?
 (a) 1:2 (b) 2:3 (c) 3:5 (d) 1:4 (e) 3:4
9. Find out the average number of girls' students of the school in all these 5 years?
 (a) 2200 (b) 1400 (c) 1600 (d) 1800 (e) 1750
10. The average number of girls' students in the school in 2015 & 2017 is what percentage of the total number of boys in the school in 2016?
 (a) 40% (b) 45% (c) 48% (d) 52% (e) 50%

Previous Years' Solutions of Prelims

1. (c): Books sold of CAT in 2018 & 2019 together
 $= 3000 + 6000 = 9000$
 Average of books sold of CAT, XAT & TISS in 2017
 $= \frac{2000+1500+1000}{3} = 1500$
 Required % $= \frac{9000-1500}{1500} \times 100 = 500\%$
2. (a): Average of books sold of XAT in 2017, 2018 & 2019 $= \frac{1500+2500+3500}{3} = 2500$
 Books sold of NMAT in 2017 & 2018 together
 $= 500 + 1000 = 1500$
 Required difference $= 2500 - 1500 = 1000$
3. (e): Books sold of SNAP in 2017, 2018 & 2019 together
 $= 1500 + 2000 + 4000 = 7500$
 Books sold of TISS in 2018 & 2019 together
 $= 1500 + 2500 = 4000$
 Required ratio $= \frac{7500}{4000} = 15 : 8$
4. (b): Books sold of CAT in 2020 $= \frac{575}{100} \times 2000 = 11500$
 Books sold of NMAT in 2020 $= \frac{140}{100} \times 2000 = 2800$
 Required number of books sold $= 11500 + 2800 = 14300$
5. (d): Total books sold of all 5 exams in 2019 together
 $= 6000 + 3500 + 4000 + 2500 + 2000 = 18000$
 Total books sold of all 5 exams in 2017 together
 $= 2000 + 1500 + 1500 + 1000 + 500 = 6500$
 Required % $= \frac{18000-6500}{6500} \times 100 = 176\frac{12}{13}\%$
6. (a): Number of boys' students in the school in 2016
 $= 4500 - 2000 = 2500$
 Required result $= \frac{3000-2500}{2500} \times 100 = 20\%$
7. (c): Average number of girls' students in the school in 2014 & 2015 $= \frac{1}{2}(2500 + 1500) = 2000$
 Boys' students in the school in 2016 $= 4500 - 2000 = 2500$
 Required result $= 2500 - 2000 = 500$
8. (e): Required ratio $= (1000 + 2000) : 4000 = 3:4$
9. (d): Required result $= \frac{2500+1500+2000+1000+2000}{5} = 1800$
10. (e): Average number of girls' students in the school in 2015 & 2017 $= \frac{1}{2}(1500 + 1000) = \frac{2500}{2}$
 Total number of boys in the school in 2016 $= 4500 - 2500 = 2000$
 Required result $= \frac{\frac{2500}{2}}{2500} \times 100 = 50\%$

Previous Years' Questions of Mains

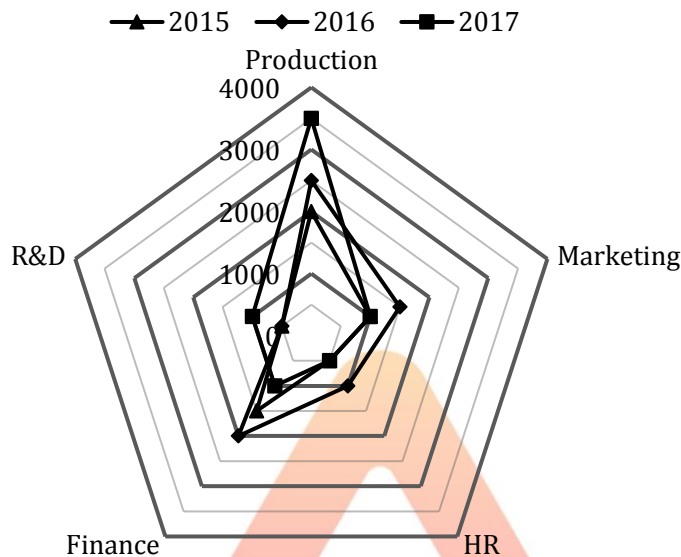
Direction (1-5): Radar chart shows total number of three types (2-wheeler, 3-wheeler & 4-wheeler) of vehicles (in '000) sold by five different companies (P, Q, R, S & T). Study the radar chart given below and answer the following questions.



- Total 4-wheelers sold by companies Q, R & T together are what percent more or less than total 2-wheelers sold by companies P & S together?
(a) 40% (b) 50% (c) 60% (d) 70% (e) 30%
- Average number of 3-wheelers sold by companies P, Q & T are how much more or less than average number of 2-wheelers sold by companies P, Q, R & S?
(a) 19,000 (b) 18,000 (c) 18,500 (d) 17,000 (e) 17,500
- If average selling price of 2-wheelers, 3-wheelers & 4-wheelers of companies Q is Rs. 0.75 lacs, 1.25 lacs & 5 lacs respectively and average selling price of 2-wheelers, 3-wheelers & 4-wheelers of companies T is Rs. 0.50 lacs, 1 lac & 7 lacs respectively, then find difference in total revenue of companies Q & T.
(a) 75,000 lacs (b) 60,000 lacs (c) 80,000 lacs (d) 1,20,000 lacs (e) 50,000 lacs
- Find the ratio of total number of 2-wheelers sold by companies P, R & T together to the total number of 3-wheelers sold by companies Q & S together?
(a) 15:13 (b) 16:11 (c) 12:7 (d) 25:9 (e) None of the above.
- Which company among these five companies sold maximum number of these three types of vehicles together?
(a) P (b) Q (c) R (d) S (e) T

Direction (6-10): Study the radar chart given below and answer the following questions.

Radar chart shows total number of employees in 5 different departments of a company in 3 different years.

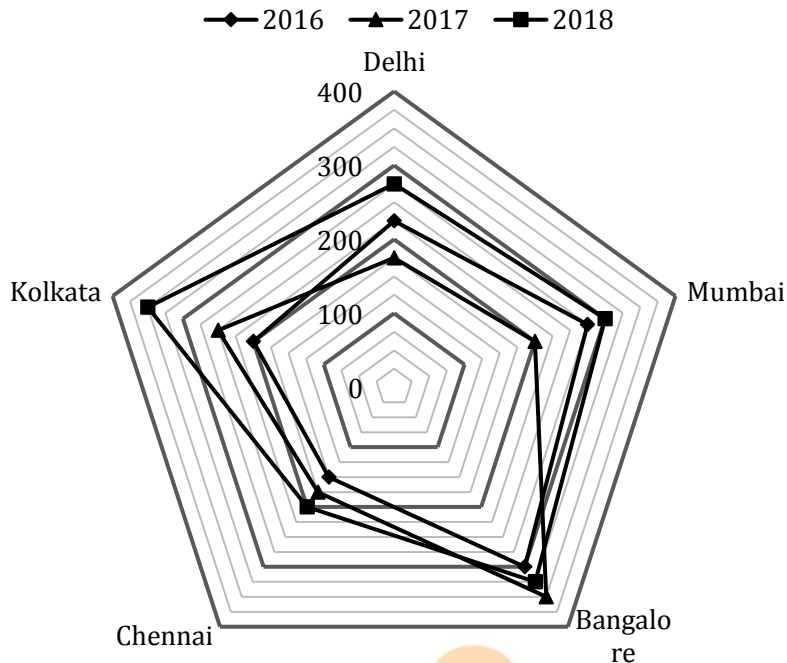


- Total number of employees in Production, HR & Finance department together of the company in 2015 are what percent more or less than total number of employees in Production, Marketing & HR department together of the company in 2016?
(a) 25% (b) 30% (c) 20% (d) 40% (e) 35%
- Average number of employees in Finance department of the company in 2015, 2016 & 2017 are how much more or less than average number of employees in Production, Marketing, HR & R&D department of the company in 2017?
(a) 500 (b) 2,000 (c) 1,000 (d) 1,500 (e) None of the above.
- If number of employees in Production department of the company in 2018 are 80% more than number of employees in Marketing department of the company in 2015, then find total number of employees in Production department of the company in 2015, 2016, 2017 & 2018 together are how much more than total number of employees in marketing department of the company in 2015, 2016 & 2017 together?
(a) 6,300 (b) 5,200 (c) 4,500 (d) 5,000 (e) 5,800

9. Find ratio of total number of employees in Production, Finance & R&D department together of the company in 2016 to total number of employees in Marketing, Finance & R&D department together of the company in 2015.
 (a) 2:5 (b) 5:3 (c) 3:5 (d) 5:2 (e) None of the above.
10. Total number of employees in these 5 departments together of the company in 2015 are what percent of total number of employees in these 5 departments together of the company in 2016?
 (a) $56\frac{2}{3}\%$ (b) $73\frac{1}{3}\%$ (c) $43\frac{1}{3}\%$ (d) $63\frac{1}{3}\%$ (e) $26\frac{2}{3}\%$

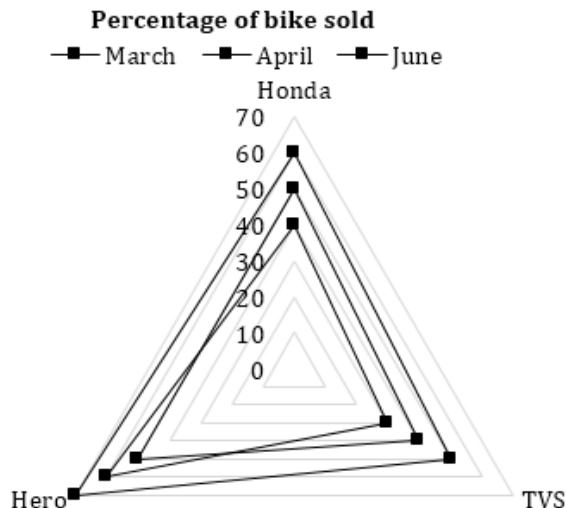
Directions (11-15): Study the radar chart given below and answer the following questions.

Radar chart shows the total number of students (in '00) who passed 10th class examination in 5 different cities in 2016, 2017 & 2018.



11. Total number of students passed in class 10th in Delhi, Bangalore and Chennai together in 2018 are what percent more or less than total number of students passed in class 10th in Delhi and Mumbai together in 2016?
 (a) 80% (b) 90% (c) 70% (d) 60% (e) 50%
12. Average number of students passed in class 10th in Delhi, Chennai and Kolkata in 2017 are how much more or less than average number of students passed in class 10th in Bangalore in 2016, 2017 & 2018?
 (a) 10,500 (b) 12,500 (c) 8,500 (d) 5,500 (e) 2,500
13. Find ratio of total number of students passed in class 10th in Bangalore, Chennai and Kolkata together in 2016 to total number of students passed in class 10th in Mumbai, Chennai and Kolkata together in 2018 respectively.
 (a) 11:15 (b) 4:9 (c) 2:3 (d) 13:17 (e) 7:13
14. Total number of students passed in class 10th in Mumbai, Bangalore and Kolkata together in 2017 are what percent of total number of students passed in class 10th in Kolkata in 2016, 2017 & 2018 together?
 (a) 120% (b) 60% (c) 80% (d) 40% (e) 100%
15. In which of these 5 cities total number of passed students in class 10th in 2016, 2017 & 2018 together is lowest?
 (a) Delhi (b) Mumbai (c) Bangalore (d) Chennai (e) Kolkata

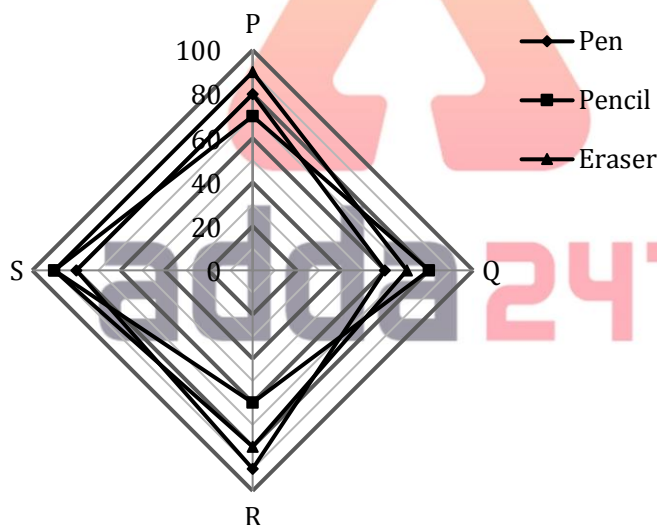
Direction (16-18): The radar graph given below shows the percentage of bike sold by three companies in three different months. Study the given graph given below and answer the following questions.



Total bikes manufactured by any company = Sold bikes + unsold bikes

- 16.** Total bikes manufactured by Honda in April & June is 50% and 100% more than that of in March respectively and average of bikes sold by Honda in March, April and June is 7050. Total _____ bikes manufactured by Honda in June.
 (a) 17000 (b) 20000 (c) 21000 (d) 18000 (e) 22000
- 17.** Total bikes manufactured by Hero decreases from March to June. It decreases by the same number in June from April as it decreased in April from March. If bikes sold by Hero in April and June are same, then total bikes manufactured by Hero in June is what percent less than total bikes manufactured by Hero in March.
 (a) $44\frac{2}{7}\%$ (b) $44\frac{3}{7}\%$ (c) $41\frac{2}{7}\%$ (d) $44\frac{4}{9}\%$ (e) $45\frac{4}{9}\%$
- 18.** Sum of total bikes sold by TVS in March and April is 7650 and sum of bikes sold by TVS in April and June is 10050. Sum of total bike sold by TVS in all the given months is 12450, and total _____ bikes manufactured by B in April.
 (a) 13125 (b) 11125 (c) 12125 (d) 12150 (e) 14125

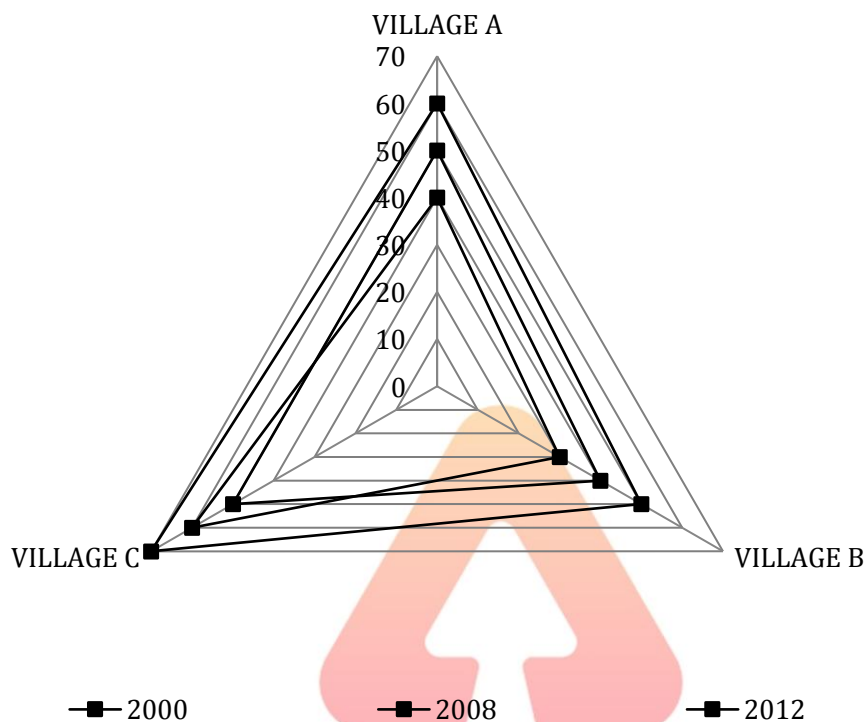
Directions (19-22): Radar chart shows the percentage of three different products (Pen, Pencil & Erasers) sold by four different stationary (P, Q, R & S) shops in 2018. Study the radar chart given below and answer the following questions.



Note – Total stock of any product each stationary shop had = Total (sold + unsold) units of that product.

19. If total unsold units of pencil by R is 80% of unsold units of pen by P and ratio of units total stock of pen, pencil and eraser shop P & R had is 5 : 3 : 4 and 3 : 2 : 6 respectively, then find total pencil and eraser sold by P are what percent of total pen & eraser sold by R?
 (a) 90% (b) 54% (c) 76% (d) 68% (e) 58%
20. If average of unsold units of pen, pencil and eraser by S is 400 and ratio of total stock of pen, pencil and eraser shop S & shop Q had is 4 : 1 : 3 & 3 : 5 : 6 respectively, then find total stock of pen, pencil and eraser shop S & shop Q had. (Given, ratio of sold units of pencil by Q to that of by S is 20 : 9 respectively).
 (a) 19000 units (b) 11000 units (c) 24000 units (d) 17000 units (e) 15000 units
21. If ratio of sold units eraser by P to that of by R is 3 : 2 and ratio of total stock of pen, pencil and eraser shop P & shop R had is 5 : 2 : 4 & 2 : 5 : 6 respectively, then find sold units of pencil by R is what percent of sold units of pen by P?
 (a) 54.5% (b) 37.5% (c) 45.5% (d) 43.5% (e) 58.5%
22. If ratio of pen sold by P, Q, R & S is 16 : 9 : 9 : 15 respectively and average units of product pen sold by P, Q, R & S is 4900 units, then find average of unsold units of pen by P & R is how much less than unsold units of pen by Q & S together?
 (a) 2900 units (b) 2500 units (c) 3600 units (d) 2300 units (e) 2800 units

Direction (23 – 25) Study the given graph given below and answer the following questions
 The graph given below shows the percentage of literates in three different villages in three years.



23. If population of A in 2000, 2008 and 2012 is in ratio 2 : 3 : 4 and average of literate in 2008, 2012 and 2000 be 1410 then find population of village A in 2000.
 (a) 1700 (b) 2000 (c) 2100 (d) 1800 (e) 2200
24. Population of village C continuously decreases from 2000 to 2012 and it decreases by the same number in 2012 from 2008 as it decreased in 2008 from 2000. If literate in C in 2008 and 2012 are same then population of C in 2012 is what percent less than population of C in 2000.
 (a) $44\frac{2}{7}\%$ (b) $44\frac{3}{7}\%$ (c) $41\frac{2}{7}\%$ (d) $44\frac{4}{9}\%$ (e) $45\frac{4}{9}\%$
25. Sum of literate from village B in 2000 and 2008 is 1530 and sum of literates in 2008 and 2012 is 2010 If sum of literates from villages B in all the given years is 2490 then find population of village B in 2008.
 (a) 2625 (b) 2200 (c) 2000 (d) 2150 (e) 2050

Previous Years' Solutions of Mains

1. **(b):** Total 4-wheelers sold by companies Q, R & T together = $25,000 + 10,000 + 25,000 = 60,000$
Total 2-wheelers sold by companies P & S together = $30,000 + 10,000 = 40,000$
Required % = $\frac{60,000 - 40,000}{40,000} \times 100 = 50\%$
2. **(e):** Average number of 3-wheelers sold by companies P, Q & T = $\frac{1}{3} \times (45,000 + 30,000 + 60,000) = 45,000$
Average number of 2-wheelers sold by companies P, Q, R & S = $\frac{1}{4} \times (30,000 + 20,000 + 50,000 + 10,000) = 27,500$
Required difference = $45,000 - 27,500 = 17,500$
3. **(c):** Total revenue of company Q = $((0.75 \times 20,000) + (1.25 \times 30,000) + (5 \times 25,000))$ lacs
= $(15,000 + 37,500 + 1,25,000)$ lacs
= 1,77,500 lacs
Total revenue of company T = $((0.50 \times 45,000) + (1 \times 60,000) + (7 \times 25,000))$ lacs
= $(22,500 + 60,000 + 1,75,000)$ lacs
= 2,57,500 lacs
Required difference = $(2,57,500 - 1,77,500)$ lacs
= 80,000 lacs
4. **(d):** Total 2-wheelers sold by companies P, R & T together = $30,000 + 50,000 + 45,000 = 1,25,000$
Total 3-wheelers sold by companies Q & S together = $30,000 + 15,000 = 45,000$
Required ratio = $\frac{1,25,000}{45,000} = 25:9$
5. **(e):** These 3 types of vehicles together sold by company P = $30,000 + 45,000 + 40,000 = 1,15,000$
These 3 types of vehicles together sold by company Q = $20,000 + 30,000 + 25,000 = 75,000$
These 3 types of vehicles together sold by company R = $50,000 + 25,000 + 10,000 = 85,000$
These 3 types of vehicles together sold by company S = $10,000 + 15,000 + 20,000 = 45,000$
These 3 types of vehicles together sold by company T = $45,000 + 60,000 + 25,000 = 1,30,000$
So, company T has sold maximum number of these three types of vehicles together.
6. **(c):** Total number of employees in Production, HR & Finance department together of the company in 2015 = $2,000 + 500 + 1,500 = 4,000$
Total number of employees in Production, Marketing & HR department together of the company in 2016 = $2,500 + 1,500 + 1,000 = 5,000$
Required % = $\frac{5,000 - 4,000}{5,000} \times 100 = 20\%$
7. **(e):** Average number of employees in Finance department of the company in 2015, 2016 & 2017 = $\frac{1,500 + 2,000 + 1,000}{3} = 1,500$
Average number of employees in Production, Marketing, HR & R&D department of the company in 2017 = $\frac{3,500 + 1,000 + 500 + 1,000}{4} = 1,500$
Required difference = $1,500 - 1,500 = 0$
8. **(a):** Number of employees in Production department of the company in 2018 = $\frac{180}{100} \times 1,000 = 1,800$
So, total number of employees in Production department of the company in 2015, 2016, 2017 & 2018 together = $2,000 + 2,500 + 3,500 + 1,800 = 9,800$
And, total number of employees in marketing department of the company in 2015, 2016 & 2017 together = $1,000 + 1,500 + 1,000 = 3,500$
Required difference = $9,800 - 3,500 = 6,300$
9. **(b):** Total number of employees in Production, Finance & R&D department together of the company in 2016 = $2,500 + 2,000 + 500 = 5,000$
Total number of employees in Marketing, Finance & R&D department together of the company in 2015 = $1,000 + 1,500 + 500 = 3,000$
Required ratio = $\frac{5,000}{3,000} = 5:3$
10. **(b):** Total number of employees in these 5 departments together of the company in 2015 = $2,000 + 1,000 + 500 + 1,500 + 500 = 5,500$
And, total number of employees in these 5 departments together of the company in 2016 = $2,500 + 1,500 + 1,000 + 2,000 + 500 = 7,500$
Required % = $\frac{5,500}{7,500} \times 100 = 73\frac{1}{3}\%$

11. (d): Total number of students passed in class 10th in Delhi, Bangalore and Chennai together in 2018 =
 $27,500 + 32,500 + 20,000$
 $= 80,000$

Total number of students passed in class 10th in Delhi and Mumbai together in 2016 = $22,500 + 27,500$
 $= 50,000$

$$\text{Required \%} = \frac{80,000 - 50,000}{50,000} \times 100 = 60\%$$

12. (b): Average number of students passed in class 10th in Delhi, Chennai and Kolkata in 2017 = $\frac{1}{3} \times (17,500 + 17,500 + 25,000)$
 $= 20,000$

Average number of students passed in class 10th in Bangalore in 2016, 2017 & 2018 = $\frac{1}{3} \times (30,000 + 35,000 + 32,500)$
 $= 32,500$

$$\text{Required difference} = 32,500 - 20,000 = 12,500$$

13. (d): Total number of students passed in class 10th in Bangalore, Chennai and Kolkata together in 2016 = $30,000 + 15,000 + 20,000$
 $= 65,000$

Total number of students passed in class 10th in Mumbai, Chennai and Kolkata together in 2018 = $30,000 + 20,000 + 35,000$
 $= 85,000$

$$\text{Required ratio} = \frac{65,000}{85,000} = 13:17$$

14. (e): Total number of students passed in class 10th in Mumbai, Bangalore and Kolkata together in 2017 = $20,000 + 35,000 + 25,000$
 $= 80,000$

Total number of students passed in class 10th in Kolkata in 2016, 2017 & 2018 together = $20,000 + 25,000 + 35,000 = 80,000$

$$\text{Required \%} = \frac{80,000}{80,000} \times 100 = 100\%$$

15. (d): Total number of passed students in class 10th in 2016, 2017 & 2018 in Delhi = $(22,500 + 17,500 + 27,500)$
 $= 67,500$

Total number of passed students in class 10th in 2016, 2017 & 2018 in Mumbai = $(27,500 + 20,000 + 30,000)$
 $= 77,500$

Total number of passed students in class 10th in 2016, 2017 & 2018 in Bangalore = $(30,000 + 35,000 + 32,500)$
 $= 97,500$

Total number of passed students in class 10th in 2016, 2017 & 2018 in Chennai = $(15,000 + 17,500 + 20,000)$
 $= 52,500$

Total number of passed students in class 10th in 2016, 2017 & 2018 in Kolkata = $(20,000 + 25,000 + 35,000)$
 $= 80,000$

So, in Chennai, total number of passed students in class 10th in 2016, 2017 & 2018 together is lowest.

16. (d): Let total bikes manufactured by Honda in March = $200x$

So, total bikes manufactured by Honda in April = $200x \times \frac{150}{100} = 300x$

And, total bikes manufactured by Honda in June = $200x \times \frac{200}{100} = 400x$

So,

$$\frac{40}{100} \times 200x + \frac{50}{100} \times 300x + \frac{60}{100} \times 400x = 7050 \times 3$$

$$470x = 21150$$

$$x = 45$$

So, total number of bikes manufactured by Honda in June = $45 \times 400 = 18000$

17. (d): Let total bikes manufactured by Hero in March, April and June be $(a + 2n)$, $(a + n)$ and a respectively

ATQ -

$$\frac{50}{100}(a + n) = \frac{70}{100} \times a$$

$$5a + 5n = 7a$$

$$2a = 5n$$

$$n = \frac{2}{5}a$$

$$\text{Required percentage} = \frac{a + 2n - a}{a + 2n} \times 100$$

$$= \frac{2 \times \frac{2}{5}a}{\frac{7}{5}a} \times 100 = 44\frac{4}{9}\%$$

18. (a): Given, Sum of total bikes sold by TVS in March and April = 7650

And, sum of bikes sold by TVS in April and June = 10050

And sum of total bike sold by TVS in all the given months = 12450

$$\text{So, bikes sold by TVS in April} = (7650 + 10050) - 12450 = 5250$$

Let bikes manufactured by B in April be x

So,

$$40\% \text{ of } x = 5250$$

$$x = 13125$$

- 19. (c):** Let total stock of pencil shop R had and total stock of pen shop of P had be $2x$ and $5y$ units respectively.

ATQ,

$$2x \times \frac{40}{100} = \frac{80}{100} \left(5y \times \frac{20}{100} \right)$$

$$x = y$$

$$\text{Total pencil and eraser sold by P} = 3y \times \frac{70}{100} +$$

$$4y \times \frac{90}{100}$$

$$= \frac{21}{10}y + \frac{36}{10}y$$

$$\text{Total pen \& eraser sold by R} = 3x \times \frac{90}{100} +$$

$$6x \times \frac{80}{100} = \frac{27}{10}x + \frac{48}{10}x$$

$$\text{Required percentage} = \frac{\left(\frac{21}{10}y + \frac{36}{10}y \right)}{\left(\frac{27}{10}x + \frac{48}{10}x \right)} \times 100 = 76\%$$

- 20. (e):** Let total units manufactured of pen, pencil and eraser by S be $400x$ units, $100x$ units & $300x$ units respectively.

ATQ,

$$\frac{1}{3} \times \left(\left(400x \times \frac{20}{100} \right) + \left(100x \times \frac{10}{100} \right) + \left(300x \times \frac{10}{100} \right) \right) = 400$$

$$\frac{1}{3} \times (80x + 10x + 30x) = 400$$

$$\Rightarrow x = 10$$

Total units manufactured of pen, pencil and eraser by S = $(400x + 100x + 300x)$

$$= 800 \times 10$$

$$= 8000$$

$$\text{Sold units of pencil by Q} = 100 \times 10 \times \frac{90}{100} \times \frac{20}{9} = 2000$$

$$\text{Total units manufactured of pencil by Q} = 2000 \times \frac{100}{80} = 2500$$

$$\text{Total units manufactured of pen, pencil and eraser by Q} = 2500 \times \frac{14}{5} = 7000$$

$$\text{Required sum} = 8000 + 7000 = 15000$$

- 21. (b):** Let total units of eraser manufactured by P & R be $4x$ & $6y$ units respectively.

$$\text{ATQ, } \frac{\left(4x \times \frac{90}{100} \right)}{6y \times \frac{80}{100}} = \frac{3}{2}$$

$$x : y = 2 : 1$$

$$\text{Required percentage} = \frac{\left(5y \times \frac{60}{100} \right)}{5x \times \frac{80}{100}} \times 100 = 37.5\%$$

- 22. (a):** Let units of pen sold by P, Q, R & S be $160p$ units, $90p$ units, $90p$ units & $150p$ units respectively.

ATQ,

$$\frac{160p + 90p + 90p + 150p}{4} = 4900$$

$$\Rightarrow p = 40$$

Unsold units of pen sold by P

$$= 160 \times 40 \times \frac{20}{80} = 1600$$

Unsold units of pen sold by Q

$$= 90 \times 40 \times \frac{40}{60} = 2400$$

$$\text{Unsold units of pen sold by R} = 90 \times 40 \times \frac{10}{90} = 400$$

$$\text{Unsold units of pen sold by S} = 150 \times 40 \times \frac{20}{80} = 1500$$

$$\text{Required difference} = (2400 + 1500) - \frac{(1600 + 400)}{2} = 2900$$

- 23. (d):** Let total population of village A in 2000, 2008 and 2012 be $200x$, $300x$ and $400x$ respectively

So,

$$\frac{40}{100} \times 200x + \frac{50}{100} \times 300x + \frac{60}{100} \times 400x = 1410 \times 3$$

$$470x = 1410 \times 3$$

$$x = 9$$

$$\text{Required population} = 9 \times 200 = 1800$$

- 24. (d):** Let population of village C in 2000, 2008 and 2012 be $(x + 2n)$, $(x + n)$ and x respectively

So,

$$\frac{50}{100} (x + n) = \frac{70}{100} (x)$$

$$5x + 5n = 7x$$

$$2x = 5n$$

$$n = \frac{2}{5}x$$

$$\text{Required percentage} = \frac{x + 2n - x}{x + 2n} \times 100$$

$$= \frac{2 \times \frac{2}{5}x}{\frac{9}{5}x} \times 100$$

$$= 44 \frac{4}{9} \%$$

- 25. (a):** Sum of literate from B in 2000 and 2008 = 1530
Sum of literate from B in 2008 and 2012 = 2010
And sum of literate from B in all years = 2490
So, literate in 2008 = $(1530 + 2010) - 2490 = 1050$
Let population of B in 2008 be x

So,

$$40\% \text{ of } x = 1050$$

$$x = 2625$$



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Chapter 08

Caselet (DI – I)

Caselet DI is just a mathematical form of English Comprehension. In Caselet DI, a long paragraph is given and on the basis of that, some questions We have to interpret the data or given paragraph in the Caselet and give answers to the questions associated with it.

Caselet DI asked in various types, i.e. Basic & Tabular based Caselet DI, Venn Diagram based Caselet DI, Arithmetic & Filler based Caselet DI etc.

With the viewpoint of recent exam patterns, Caselet DI can be broadly classified as

- (i) Basic & Tabular Based Caselet DI
- (ii) Venn Diagram Based Caselet DI
- (iii) Arithmetic & Filler Based Caselet DI

(i) Basic & Tabular Based Caselet DI – These types of Caselet DI solution can be represented in the form of table.

Before start solving Basic & Tabular Based Caselet DI, you must have knowledge of following things

- (a) knowledge of addition, subtraction, multiplication and divide etc.
- (b) knowledge of percentage, fraction, ratio and proportion, Average etc.

Basic & Tabular Based Caselet DI contains:

- Concept with Solved Examples
- Practice MCQs for Prelims
- Practice MCQs for Mains
- Previous Years' Questions of Prelims
- Previous Years' Questions of Mains

Solved Examples

Directions (1-3): Study the following data given below carefully and answer the following questions.

There are total 450 tickets which are used either to watch cricket or to watch hockey match on the same day. The ratio of males and females who use their ticket in watching hockey match is 13:7 respectively. The number of males who use their tickets in cricket is 72 more than the number of females who use their tickets in hockey. Total number of males who use their tickets in cricket and hockey together is 174 more than the total number of females who use their tickets in cricket and hockey together

1. Find the ratio of total number of persons who uses their ticket in cricket to the total number of persons who uses their ticket in hockey?
 (a) 8 : 7 (b) 6 : 5 (c) 5 : 6 (d) 7 : 8 (e) 9 : 7
2. Total number of females who uses their ticket in cricket and hockey together is how much more/less than the total number of males who uses their ticket for watching hockey?
 (a) 20 (b) 18 (c) 24 (d) 22 (e) 26
3. Out of total males who uses their ticket in watching cricket match, 25% are special guest, then find the total number of males who uses their ticket in watching cricket excluding the special guests ?
 (a) 112 (b) 126 (c) 104 (d) 111 (e) 117

Sol (1-3):

Let number of male and female who use their ticket in watching hockey match be $13x$ and $7x$ respectively.

Number of male who use their ticket in watching cricket = $72 + 7x$

Now, let number of female who use their ticket in watching cricket be y .

ATQ,

Total number of tickets = 450

Now, $7x + 72 + 13x = 7x + y + 174$

$13x - y = 102$ (1)

Again, $7x + 72 + 13x + y + 7x = 450$

$27x + y = 378$ (2)

Solving eqn. (1) and (2), we get

$x = 12$

$y = 13x - 102$

$= 156 - 102 = 54$

	Male	Female
Cricket	$7x + 72 = 7 \times 12 + 72 = 156$	$y = 54$
Hockey	$13x = 13 \times 12 = 156$	$7x = 7 \times 12 = 84$

1. **(d):** Total number of persons who uses their ticket in cricket = $156 + 54 = 210$
 total number of persons who uses their ticket in hockey = $156 + 84 = 240$
 Required ratio = $\frac{210}{240} = 7 : 8$
2. **(b):** Total number of females who uses their ticket in cricket and hockey together = $84 + 54 = 138$
 total number of males who uses their ticket for watching hockey = 156
 Required difference = $156 - 138 = 18$
3. **(e):** Special guests out of total males who uses their ticket in watching cricket match = $156 \times \frac{25}{100} = 39$
 total number of males who uses their ticket in watching cricket excluding the special guests = $156 - 39 = 117$

Direction (4 – 7): Given data shows total male and female employees in three companies in a seminar. Read data carefully and answer the questions: -

In annual seminar of three companies, HCL, IBM and TCS some male and female employees represent their companies. Average number of female employees who represent HCL and IBM is 420. Total male employees in HCL and IBM are 1620. Number of female employees is $\frac{2}{3}$ rd and $\frac{2}{5}$ th of male employees in HCL and IBM respectively. Total female employees who represent TCS are 25% more than total female employees who represent HCL and total male employees who represent TCS are $33\frac{1}{3}\%$ more than total female employees who represent IBM.

4. Total employees who represent HCL is what percent more than total male employees who represent IBM?
 (a) $33\frac{1}{3}\%$ (b) $30\frac{1}{3}\%$ (c) $27\frac{1}{3}\%$ (d) $29\frac{1}{3}\%$ (e) $39\frac{1}{3}\%$
5. 25% of total female employees and 20% of total male employees who represent IBM & TCS together have MBA degree, then find total employees who do not have MBA degree?
 (a) 1624 (b) 1424 (c) 1824 (d) 1648 (e) 1244
6. Find the ratio between total male employees who represent IBM & TCS together to total female employees who represent HCL & TCS together?
 (a) 23 : 13 (b) 23 : 14 (c) 23 : 18 (d) 23 : 12 (e) 23 : 20
7. Find difference between Total male employees who represent TCS and total female employees who represent IBM?
 (a) 120 (b) 140 (c) 100 (d) 160 (e) 180

Sol. (4 – 7):

Total number of female employees who represent HCL and IBM = $420 \times 2 = 840$

Let, Number of male employees who represent HCL = a

And, Number of male employees who represent IBM = b

ATQ,

$$a + b = 1620 \dots (i)$$

$$\frac{2}{3}a + \frac{2}{5}b = 840 \dots (ii)$$

On solving (i) & (ii)

$$a = 720, b = 900$$

Number of female employees who represent HCL

$$= \frac{2}{3} \times 720 = 480$$

Number of female employees who represent IBM

$$= \frac{2}{5} \times 900 = 360$$

$$\text{Total Female employee who represent TCS} = 480 \times \frac{125}{100} = 600$$

$$\text{Total male employee who represent TCS} = 360 \times \frac{4}{3} = 480$$

Companies	Male	Female
HCL	720	480
IBM	900	360
TCS	480	600

4. **(a):** Total employees who represent HCL = $720 + 480 = 1200$
 Required percentage = $\frac{1200-900}{900} \times 100 = 33\frac{1}{3}\%$
5. **(c):** Total employees who represent IBM & TCS who do not have MBA degree
 $= (900 + 480) \times \frac{80}{100} + (360 + 600) \times \frac{75}{100} = 1104 + 720 = 1824$
6. **(c):** Required ratio = $\frac{(900+480)}{(480+600)} = 23 : 18$
7. **(a):** Required difference = $480 - 360 = 120$

Directions (8-12): Study the following information given in the paragraph and answer the questions accordingly. Following information gives data regarding number of employees (male+female) in different company viz. A, B, C and D. Total employees in company C is 440 and its male employees are 20 more than its female employees. The no. of male employees in company B is 30% less than male employees of company D. The ratio of male to female employees in company A and B is 9:7 and 3:1 respectively. The male employees of company B is equal to female employees in company C. Female employees in company A and B are equal. The female employees of company D is 2 more than female employees of company C.

8. Find the ratio of female employees of company D to male employees of company C?
 (a) $\frac{7}{23}$ (b) $\frac{106}{117}$ (c) $\frac{106}{115}$ (d) $\frac{53}{75}$ (e) none of these
9. Find the average of male employees of all the company together.
 (a) 207.5 (b) 181.5 (c) 226 (d) 150.5 (e) 156
10. For how many companies the no. of female employees is more than no. of male employees in that company?
 (a) 3 (b) 1 (c) 2 (d) none of these (e) 0
11. Find the difference between the average of male employees in company A, B and D together and no. of female employees in company D.
 (a) 15 (b) 23 (c) 20 (d) 12 (e) none of these
12. Find the total employees in all the company together.
 (a) 1482 (b) 1392 (c) 1402 (d) 1502 (e) 1202

Sol (8-12):

Let the male employees of company D be $3x$.

Company	Male	Female
A	$0.9x$	$0.7x$
B	$2.1x$	$0.7x$
C	$(2.1x)+20$	$2.1x$
D	$3x$	$(2.1x)+2$

Given Total employees in company C = 440
 i.e. $(2.1x + 2.1x + 20) = 440$

Company	Male	Female
A	90	70
B	210	70
C	230	210
D	300	212

8. (c): required ratio $\frac{212}{230} = \frac{106}{115}$
9. (a): Required average = $\frac{(90+210+230+300)}{4} = \frac{830}{4} = 207.5$
10. (e): As it can be seen from the table there is no company in which no. of female employees is greater than male employees.
11. (d): average of male employees in company A, B and D together = $\frac{90+210+300}{3} = 200$
 No. of female employees in company D = 212
 Required difference = $212 - 200 = 12$
12. (b): required total employees in all the company together = $(90 + 210 + 230 + 300 + 70 + 70 + 210 + 212) = 1392$

Directions (13-17): Read the information given below and answer the following questions. Data given below is the number of employees distributed in different departments in year 2017.

There are four departments in an organization, i.e., **(HR, Marketing, Accounts and Operations)**. There are total of 205 employees in the organization.

- **(HR + Marketing + Accounts):** Total female employees in HR and Marketing are 45. Ratio of total employees in HR, Marketing and Accounts department is 4 : 9 : 2. Number of females in Marketing is five more than number of females in HR.
- **Operations:** Total number of employees in Operations is 55 and males in Operations are one-sixth of total males in all departments. Females in Operation department are 15 more than total employees in Accounts department.
- 13.** If in year 2018, total number of males in all departments and total no. of females in all departments increases by same number 'x' and ratio of total male to total female in 2018 is 4 : 3, then find the value of 'x'.
 (a) 45 (b) 40 (c) 20 (d) 10 (e) 35
- 14.** Total employees in Marketing department is approximately what percent of total employees in all departments.
 (a) 55% (b) 32% (c) 49% (d) 44% (e) 60%
- 15.** What is the ratio of no. of males in Accounts department to female in HR department?
 (a) 3 : 4 (b) 9 : 11 (c) 1 : 5 (d) 7 : 10 (e) None of the above.
- 16.** What is the difference between no. of total employees in Marketing and Operations department?
 (a) 50 (b) 35 (c) 10 (d) 25 (e) 5
- 17.** Female employees in HR & Operations department together are what percent more or less than males in HR & Operations department together?
 (a) 23.5% (b) 37.5% (c) 28.5% (d) 32.5% (e) 40.5%

Sol (13 - 17):

Let total employees in HR, Marketing and Accounts department be $4x$, $9x$ & $2x$ respectively.

Let numbers of female employees in HR department be y .

So, number of female employees in Marketing department = $y + 5$

ATQ,

$$y + y + 5 = 45$$

$$2y = 40$$

$$y = 20$$

$$\text{And, } 4x + 9x + 2x + 55 = 205$$

$$15x = 150$$

$$x = 10$$

$$\text{Hence, number of female employees in Operations department} = 2 \times 10 + 15 = 35$$

Now,

$$\text{Male employees in Operations department} = 55 - 35 = 20$$

$$\text{Male employees in HR department} = 4x - y = 40 - 20 = 20$$

$$\text{Male employees in Marketing department} = 9x - (y + 5)$$

$$= 90 - 25 = 65$$

Now,

Let male employees in Accounts department be 'a'.

$$\text{So, } (65 + 20 + 20 + a) \times \frac{1}{6} = 20$$

$$a = 15$$

$$\text{Hence, female employees in Accounts department} = 2x - 15 = 20 - 15 = 5$$

Department	Total Employees	Male Employees	Female Employees
HR	40	20	20
Marketing	90	65	25
Accounts	20	15	5
Operations	55	20	35

$$13. (c): \text{ATQ, } \frac{20+65+15+20+x}{20+25+5+35+x} = \frac{4}{3}$$

$$\frac{120+x}{85+x} = \frac{4}{3}$$

$$360 + 3x = 340 + 4x$$

$$x = 20$$

$$14. (d): \text{Required}\% = \frac{90}{205} \times 100$$

$$= \frac{1800}{41}\% = 43.902\% = 44\% \text{ (approx.)}$$

$$15. (a): \text{Required ratio} = \frac{15}{20} = \frac{3}{4} = 3 : 4$$

$$16. (b): \text{Required difference} = 90 - 55 = 35$$

$$17. (b): \text{Required}\% = \frac{(20+35)-(20+20)}{(20+20)} \times 100$$

$$= \frac{15}{40} \times 100 = 37.5\%$$

Direction (18 - 22): Given data shows total male and female employee in three companies in a seminar. Read data carefully and answer the questions: -

In annual seminar of three companies, A, B and C some male and female employees represent their companies. Average number of female employees who represent A and B is 420. Total male employee in A and B is 1620. Number of female employees is $\frac{2}{3}$ rd and $\frac{2}{5}$ th of male employee in A and B respectively. Total female employee who represents C are 25% more than total female employee who represent A and total male employee who represent C are $33\frac{1}{3}\%$ more than total female employee who represent B.

18. Total employees who represent A is what percent more than total male employee who represent B ?

- (a) $33\frac{1}{3}\%$ (b) $30\frac{1}{3}\%$ (c) $27\frac{1}{3}\%$ (d) $29\frac{1}{3}\%$ (e) $39\frac{1}{3}\%$

19. 25% of total female employee and 20% of total male employee who represent B & C together have MBA degree, then find total employee who do not have MBA degree?

- (a) 1624 (b) 1424 (c) 1824 (d) 1648 (e) 1244

20. Find the ratio between total male employee who represent B & C together to total female employee who represent A & C together?

- (a) 23 : 13 (b) 23 : 14 (c) 23 : 18 (d) 23 : 12 (e) 23 : 20

21. Find difference between Total male employees who represent C and total female employee who represent B?

- (a) 120 (b) 140 (c) 100 (d) 160 (e) 180

22. Find average number female in B & C ?

- (a) 480 (b) 420 (c) 520 (d) 540 (e) 600

Solutions (18 - 22):

Total number of female employee who represent A and B = $420 \times 2 = 840$

Let, Number of male employee who represent A = a

And, Number of male employee who represent B = b

ATQ,

$$a + b = 1620 \dots(i)$$

$$\frac{2}{3}a + \frac{2}{5}b = 840 \dots(ii)$$

On solving (i) & (ii)

$$a = 720, b = 900$$

Number of female employees who represent A

$$= \frac{2}{3} \times 720 = 480$$

Number of female employees who represent B

$$= \frac{2}{5} \times 900 = 360$$

$$\text{Total Female employee who represent C} = 480 \times \frac{125}{100} = 600$$

$$\text{Total male employee who represent C} = 360 \times \frac{4}{3} = 480$$

Companies	Male	Female
A	720	480
B	900	360
C	480	600

18. (a): Total employee who represent A = 720 + 480 = 1200

$$\text{Required percentage} = \frac{1200-900}{900} \times 100 = 33\frac{1}{3}\%$$

19. (c): Total employee who represent B & C who do not have MBA degree

$$= (900 + 480) \times \frac{80}{100} + (360 + 600) \times \frac{75}{100} = 1104 + 720 = 1824$$

$$20. (c): \text{Required ratio} = \frac{(900+480)}{(480+600)} = 23 : 18$$

$$21. (a): \text{Required difference} = 480 - 360 = 120$$

$$22. (a): \text{Required average} = \frac{360+600}{2} = 480$$






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Practice MCQs for Prelims

Directions (1-5) :- Study the given information carefully and answer the following questions.

The data given below shows the production of 3 types of products i.e. Fans, Refrigerator and TV by a company. Units of fans manufactured by company are 275% more than units of Refrigerator manufactured by company and production of TV are two times of production of Refrigerator. During testing company found some faulty products, which cannot be sold. 20% of the refrigerators manufactured by company are faulty which are 160. Faulty units of TV, Fans and Refrigerator are in the ratio of 6 : 13 : 4.

- Faulty units of fans are how much more or less than correct TVs?
(a) 2240 units (b) 480 units (c) 840 units (d) 1680 units (e) 760 units
- What is the average no. of correct units of all three products? (approximate)
(a) 1493 units (b) 1506 units (c) 1460 units (d) 1527 units (e) 1443 units
- If per unit cost price of Fan is Rs 2500 and per unit selling price is Rs 3000, then find percent loss/ gain of company on selling total quantity of fans manufactured.
(a) 1% loss (b) 0.8% gain (c) 0.6% loss (d) 0.8% loss (e) 1% gain
- What is the total produced units of Refrigerator?
(a) 3000 (b) 800 (c) 1600 (d) 520 (e) 2400
- Find the ratio between faulty units of Fans and correct units of TV.
(a) $\frac{13}{32}$ (b) $\frac{31}{3}$ (c) $\frac{33}{7}$ (d) $\frac{35}{13}$ (e) $\frac{13}{34}$

Directions (6-10) :- Paragraph given below gives information of literate and illiterate population out of total population of three cities i.e. A, B and C. Read the paragraph carefully and answer the following questions.

Total population of city A and B are 22000 and 16000 respectively. Total literate population of city B is 6000 which is 6.25% of total population of city C. Ratio of literate to illiterate population in city A and C is 5:6 and 2:1 respectively. 40% of literate population in each city is graduate.

- Literate population from city B are what percent of illiterate population of city A?
(a) 100% (b) 75% (c) 50% (d) 40% (e) 60%
- What is the ratio between graduate population of city C and total population of city B?
(a) 5:8 (b) 3:5 (c) 5:3 (d) 8:5 (e) 1:3
- What is the difference between graduate population of city B and illiterate population of city C?
(a) 29600 (b) 28400 (c) 28600 (d) 29400 (e) None of these.
- Population which is literate but ungraduated from city A are what percent graduate population of city B?
(a) 500% (b) 250% (c) 300% (d) 120% (e) 375%
- If ratio of male to female in graduate population from city C is 9:7, find difference between graduate male from city C to literate but ungraduated from city B?
(a) 7200 (b) 14400 (c) 10800 (d) 12000 (e) 11800

Directions (11-15) :- Study the given data carefully and answer the following questions.

In a school, 3500 students participated in three sports games i.e. (Badminton, cricket and football). Ratio between boys and girls who participated in games is 9 : 5. 30% of the total boys participated in Badminton which is 125% of the girls who participated in Cricket. Total 1265 students participated in Cricket. No. of girls participated in Badminton are 10 more than that of Football.

Note- A student participated in only in a particular sport.

- What is the no. of students participated in Badminton?
(a) 1035 (b) 1200 (c) 1265 (d) 1025 (e) 1245
- Boys participated in Football is what percentage more/less than that of girls participated in the same sport?
(a) $242\frac{6}{7}\%$ (b) $132\frac{1}{7}\%$ (c) $580\frac{14}{17}\%$ (d) $142\frac{6}{7}\%$ (e) $146\frac{1}{7}\%$

13. Find the ratio between no. of boys participated in Cricket to the no. of girls participated in Football.
 (a) 27 : 14 (b) 29 : 15 (c) 29 : 14 (d) 15 : 28 (e) None of these
14. Girls participated in Badminton is what percentage of girls participated in Cricket?
 (a) 150% (b) $133\frac{1}{3}\%$ (c) 75% (d) $66\frac{2}{3}\%$ (e) 85%
15. Girls participated in Football is how much more/less than that of boys participated in same sport.
 (a) 400 (b) 185 (c) 315 (d) 145 (e) 500

Directions (16-20): - Paragraph given below gives information of income, expenditure and saving of three friends, read the paragraph carefully and answer the following questions.

Three friends Deepak, Ankit and Shivam spent money in the ratio 2:5:3 and ratio of saving of Deepak to Shivam and income of Ankit to Shivam is 10:7 and 3:2 respectively. Ankit's saving is 100% more than his expenditure and average saving of Shivam and Ankit is Rs. 8500. (Income = Expenditure + Saving)

16. If income and expenditure of Deepak is increases by 10% and 20%, find percentage increase in his saving?
 (a) 10% increase (b) 8% increase (c) 4% decrease (d) 1% decrease (e) None of these.
17. Expenditure of Shivam is what percent of his income?
 (a) 20% (b) 60% (c) 30% (d) 15% (e) 12%
18. What is the ratio of average saving of Deepak and Ankit to income of Shivam?
 (a) 1:2 (b) 2:3 (c) 3:1 (d) 1:3 (e) 1:1
19. If Ankit spent 15% of his income on rent and 35% of his expenditure on food and rest he spent on other expenses, find how much he spent on other expenses?
 (a) Rs. 1000 (b) Rs. 1750 (c) Rs. 2250 (d) Rs. 1500 (e) Rs. 750
20. What is average income of Deepak, Ankit and Shivam?
 (a) Rs. 11333.33 (b) Rs. 12333.33 (c) Rs. 11366.67 (d) Rs. 12366.67 (e) None of these

Directions (21-25): Study the given passage carefully and answer the questions.

Six students A, B, C, D, E and F participated in a test of 200 marks. C scored 50% marks which are 25% higher than that of E. ratio of marks obtained by A, B and F is 12:8:9 respectively. D scored 62.5% more marks than E who scored same marks as by B.

21. Who scored highest marks among 6 students?
 (a) C (b) A (c) D (d) F (e) B and E
22. If passing marks is 40% of maximum marks then marks scored by D are what percent more than the passing marks?
 (a) 62.5 (b) 66.67 (c) 75 (d) 57.5 (e) 50
23. What is ratio of marks obtained by B, D and F?
 (a) 9 : 13 : 8 (b) 9 : 8 : 13 (c) 8 : 9 : 13 (d) 13 : 9 : 8 (e) 8 : 13 : 9
24. What is average marks obtained by all 6 students?
 (a) 120 (b) 100 (c) 150 (d) 60 (e) 90
25. If another student X scores more marks than B but less than A. what could be his marks out of total marks? (in %)
 (i) 39% (ii) 45% (iii) 54%
 (iv) 62.5% (v) 40% (vi) 60%
 (a) (ii), (iii), (v), (vi) (b) (i), (ii), (iii), (v) (c) (ii), (iii), (iv), (vi)
 (d) (ii), (iii) (e) None of the given options

Directions (26-30): Study the passage given below and answer the following questions.

There are 4 schools – P, Q, R & S. Boys in R are 5% more than boys in P and ratio of boys in Q to that of in S is 3 : 2. In P, boys and girls are equal and in R, boys are 100% more than girls. Girls in Q are 76 less than girls in P. Ratio of girls in Q to that of in S is 3 : 2. Average number of girls in Q, R & S is 250. Total students in Q are 180 more than total students in S.

26. Girls in Q & S together are what percent more or less than boys in P?
 (a) 55% (b) 35% (c) 45% (d) 40% (e) 50%

27. Total students in P & S together are how much more or less than total students in Q & R together?
 (a) 70 (b) 90 (c) 10 (d) 120 (e) 40
28. Boys in Q & S together are what percent of total students in P?
 (a) 30% (b) 45% (c) 50% (d) 65% (e) 40%
29. Find ratio of average number of boys in Q, R & S to total students in Q.
 (a) 4 : 7 (b) 1 : 6 (c) 11 : 16 (d) 13 : 27 (e) None of the above.
30. Boys in S & girls in R together are what percent less than girls in P?
 (a) 10.5% (b) 12.5% (c) 11.5% (d) 8.5% (e) 13.5%

Directions (31-35): Study the given information and answer the following questions.

A company sold 6 types of products viz. Hard drive, Mobile, Laptop, Pen drive, Keyboards and Printer in 2018. In 2018, company sold 4500 pen drives which is 250% of mobiles sold by company. Hard drive, Laptop and Printer sold in the ratio of 25 : 16 : 21. The average number of selling of Hard drive and Keyboard is 3000. Pen drive sold are 1000 more than Keyboard.

31. What is the no. of units of Printer sold by the company in 2018?
 (a) 1600 (b) 2100 (c) 2500 (d) 1800 (e) 4500
32. What is the average no. of units of Mobiles, Pen drives and Printer sold by company?
 (a) 2600 (b) 2900 (c) 3100 (d) 2800 (e) 2400
33. Maximum units of which product sold by the company?
 (a) Keyboard (b) Mobiles (c) Pen drives (d) Hard disks (e) Printer
34. Printers sold by the company is what percent more or less than Keyboard?
 (a) 35% (b) 66.67% (c) 45% (d) 40% (e) 50%
35. What is the ratio between the sold units of Hard drive and pen drive together to that of mobiles and printers together?
 (a) $\frac{39}{70}$ (b) $\frac{41}{70}$ (c) $\frac{70}{39}$ (d) $\frac{71}{41}$ (e) None of these

Directions (36-40): Study the passage given below carefully and answer the following questions.

In a school, there are total of 243 students in 5 classes (i.e. class – I, II, III, IV & V). Students in Class – IV are 50% more than students in Class – II and students in Class – III are 10 more than students in Class – II. Students in Class – V are 80% of students in Class – IV and ratio of students in Class – I to that of in Class – V is 15 : 16.

36. If ratio of boys to girls in Class – I & IV is 3 : 2 and 8 : 7 respectively, then find number of girls in Class – I & IV together is what percent of total students in Class – II?
 (a) 115% (b) 130% (c) 120% (d) 135% (e) 125%
37. If ratio of students who play basketball, football and cricket in Class – III & V is 2 : 1 : 2 and 2 : 3 : 3 respectively, then find ratio of students who play football in these 2 classes together to students who play cricket in these two classes together.
 (a) 11 : 9 (b) 1 : 1 (c) 7 : 4 (d) 6 : 1 (e) None of the above.
38. If ratio of girls to boys in Class – II is 2 : 3 and average weight of boys in Class - II is 40kg and average weight of girls in Class – II is 25kg, then find the average weight of Class – II.
 (a) 33 kg (b) 34 kg (c) 37 kg (d) 36 kg (e) 35 kg
39. Find average number of students in Class – II, III & V.
 (a) 52 (b) 46 (c) 45 (d) 42 (e) 49
40. If total students in Class – VI are equal to 150% of average number of students in Class – II & V, then find difference between total students in Class – VI and total students in Class – IV.
 (a) 18 (b) 9 (c) 12 (d) 6 (e) 15

Directions (41-45): Study the following information carefully and answer the question accordingly.

Three stationary owners A, B and C sells Pen and Pencil. The ratio of the number of pen to pencil sold by stationary A was 7:5 and that sold by stationary B was 3:2 respectively. The number of pens and pencil sold by stationary C was 128 and ratio of number of pen to pencil sold by stationary C was 5:3. The total number of pens sold by stationary A was 10 % more than the pen sold by stationary B. Total numbers of pen and pencils sold by all the three stationary was 874.

41. If cost of each pen and each pencil sold by A is Rs 20 and Rs 10 respectively, then find total amount earned by stationary A?
 (a) Rs 6370 (b) Rs 6470 (c) Rs 6270 (d) Rs 6300 (e) Rs 6400
42. What is the ratio of pens sold by stationary A and B together to pencils sold by B and C together?
 (a) 188:441 (b) 441:188 (c) 233:447 (d) 447:233 (e) None of these
43. Find average numbers of pens sold by all the three stationary?
 (a) 176.67 (b) 172.67 (c) 177.67 (d) 173.67 (e) 179.67
44. If number of pens sold by stationary B is increased by 20% and number of pencils sold by stationary C is increased by 25%, then what is sum of total pens sold by stationary B and pencil sold by stationary C?
 (a) 312 (b) 322 (c) 328 (d) 340 (e) 304
45. What is the difference between total number of pens sold by all the 3 stationary together and total number of pencils sold by all the 3 stationary together?
 (a) 178 (b) 172 (c) 168 (d) 184 (e) 190

Directions (46-50): Read the given information carefully and answer the following question.

There are two trains P and Q. Both trains have four different types of coaches i.e. General, sleeper class, first class and AC coaches. In train P, there are total 800 passengers. Train Q has 40% more passengers than train P. 20% of the passengers of train P are in general coaches. One-fourth of the total number of passengers of train P are in AC coaches. 25% of the passengers of train P are in sleeper class coaches. Remaining passengers of train P are in first class coaches. Total number of passengers in AC coaches in both the trains together is 480. 45% of the number of passengers of train Q is in sleeper class coaches and ratio of passengers of train Q in first class coaches to general class coaches is 3:4.

46. What is the ratio of total number of passengers travelling in general coaches to the total number of passengers travelling in AC coaches of both the trains?
 (a) 8:15 (b) 3:5 (c) 11:15 (d) 22:25 (e) 5:9
47. Number of passengers travelling in AC coach of train Q is what percent of number of passengers travelling in sleeper coaches of train Q?
 (a) $55\frac{5}{9}\%$ (b) $54\frac{4}{9}\%$ (c) $53\frac{1}{3}\%$ (d) $51\frac{1}{9}\%$ (e) $52\frac{2}{9}\%$
48. Total number of passengers of train P who are travelling in General and Sleeper coaches together are what percent more or less than the total number of passengers of both the trains travelling in AC coaches?
 (a) 22.5% (b) 20% (c) 15% (d) 30% (e) 25%
49. Find the average number of passengers travelling in sleeper and first class coaches of both trains?
 (a) 524 (b) 544 (c) 562 (d) 574 (e) 580
50. Difference of passengers travelling in General and Sleeper coaches of both the trains is what percent of total passengers travelling in both the trains?
 (a) $18\frac{1}{3}\%$ (b) $17\frac{1}{2}\%$ (c) $16\frac{2}{3}\%$ (d) $22\frac{1}{2}\%$ (e) 20%

Directions (51-55): Read the given information carefully and answer the following questions.

The number of male passengers who boarded Delhi-Bangalore Rajdhani express is 175% of the number of female passengers who boarded the same train. The ratio of the number of passengers who like Tea, Coffee and Lassi is 61 : 67 : 37. Each passenger likes only one item out of three.

The number of male passengers who like Tea is $28\frac{4}{7}\%$ more than the male passengers who like Coffee. Ratio of the number of male passengers who like Lassi and the male passengers who like Tea is 5:9. Number of female passengers who like Coffee is 320 and is $53\frac{1}{3}\%$ of the number of total female passengers. The ratio of number of female passengers who like Tea and Lassi is 4 : 3.

51. Find the difference between the male passengers who like Lassi and female passengers who like Tea.
 (a) 100 (b) 90 (c) 80 (d) 70 (e) 60
52. The number of female passengers who like Tea and Lassi together is how much percent more or less than the number of male passengers who like coffee?
 (a) 20% (b) 25% (c) 40% (d) 30% (e) $22\frac{1}{2}\%$
53. Find the average of the number of passengers who like Tea and Coffee together?
 (a) 620 (b) 630 (c) 640 (d) 650 (e) 660
54. Find the ratio of the total passengers who like Tea and Lassi together to the total number of male passengers?
 (a) 12 : 13 (b) 4 : 5 (c) 14 : 15 (d) 2 : 3 (e) 7 : 8
55. Total number of male passengers who like Coffee and female passengers who like Tea together are what percent of the total number of passengers?
 (a) $31\frac{10}{11}\%$ (b) $30\frac{10}{11}\%$ (c) $33\frac{1}{11}\%$ (d) $35\frac{2}{11}\%$ (e) $30\frac{1}{11}\%$

Directions (56-60): Study the given information carefully and answer the following questions.

In year 2016, 1500 students are selected by different public sector banks (Dena bank, Canara bank, Indian bank, PNB, SBI, Allahabad bank and corporation bank).

Number of students selected in Dena bank is $8\frac{1}{3}\%$ of total selected students. 240 students are selected in Indian bank. Number of students selected in Dena bank is $16\frac{2}{3}\%$ less than those selected in Allahabad bank. Ratio between students selected in Canara bank and Corporation bank is 8 : 11. Students selected in Corporation bank are 35 more than those selected in Indian bank. Average number of students selected in Canara bank, Dena bank and SBI are 215.

56. What is the ratio between no. of students selected in Canara bank to that of Indian bank?
 (a) 4 : 5 (b) 5 : 6 (c) 3 : 4 (d) 4 : 7 (e) 5 : 8
57. Students selected in SBI are how much percent more/less than that of the Indian bank?
 (a) 33.33% (b) 113.33% (c) 37.5% (d) 25% (e) 27.5%
58. What is the difference between average number of students selected in Canara bank, PNB & Allahabad bank and number of students selected in Corporation bank?
 (a) 95 (b) 180 (c) 85 (d) 75 (e) 105
59. Number of students selected in Corporation bank is what percent of Dena bank?
 (a) 45.45% (b) 54.54% (c) 120% (d) 220% (e) None of these
60. In which bank from the following banks, number of selection of students is maximum?
 (a) Dena bank (b) Corporation bank (c) PNB (d) Canara bank (e) SBI

Directions (61-65): The data given below shows the distribution of employees of two companies X and Y in three departments viz. Administration, HR and others.

Total employees in company X and Y together are 5600 and the ratio of employees in company X and Y is 4 : 3.

In company X - No. of male employees are 60%. No. of males working in administration are 30% of total males. Ratio of males working in HR and others is 2 : 5. $\frac{3}{8}$ th of total females are working in HR and no. of females working in Administration are 50 less than females working in others.

In company Y - No. of male employees are 65%. Total 420 males work in HR department, which is 120% of the females working in HR. No. of males working in Administration are $\frac{3}{4}$ th of males in HR. 250 females works in Administration.

61. What is the no. of male employees working in Administration department of company X and Y together?
 (a) 981 (b) 971 (c) 891 (d) 881 (e) 871
62. Male employees in HR department of company Y is what percent of female employee in HR department of company X?
 (a) 115% (b) 87.5% (c) 92% (d) 110% (e) 85%

63. Find the ratio between male employee in Others of company X and male employee in HR of company Y.

- (a) $\frac{7}{16}$ (b) $\frac{15}{8}$ (c) $\frac{16}{9}$ (d) $\frac{8}{15}$ (e) $\frac{16}{7}$

64. What is the difference between no. of males in company X and no. of females in company Y?

- (a) 1080 (b) 1240 (c) 960 (d) 880 (e) 1020

65. No. of females in Administration in company X is what percent more/less than no. of males in Others in company Y?

- (a) 120% (b) 90% (c) 64% (d) 54.54% (e) 50.5%

Directions (66-70): Read the passage given below and answer the following questions.

A company which has only 5 employees, i.e. A, B, C, D & E, manufactures shirts. Company sold 2490 shirts in April, which is 83% of the total shirts manufactured by the company in April. Shirts manufactured by A in April is 75% of the shirts manufactured by C in April. Ratio of shirts manufactured in April by B & C is 5 : 2. Average number of shirts manufactured in April by D & E is 650. Shirts manufactured by C in April are 150 less than shirts manufactured by E in April. Each employee of the company worked for 25 days in April.

66. Shirts manufactured by A & C together in April are what percent of shirts manufactured by B in April.

- (a) 20% (b) 70% (c) 40% (d) 30% (e) 60%

67. Shirts manufactured by D in 1 day in April are how much more or less than shirts manufactured by E in 1 day in April?

- (a) 9 (b) 5 (c) 2 (d) 7 (e) 8

68. Find the average number of shirts manufactured by B, C & E in April.

- (a) 350 (b) 500 (c) 650 (d) 600 (e) 400

69. If cost of manufacturing a shirt in April is Rs.32 and company sold each shirt at 25% profit in April, then find the total profit earned by the company on sold shirts in April.

- (a) Rs.12640 (b) Rs.19920 (c) Rs.20480 (d) Rs.17560 (e) Rs.14540

70. Shirts manufactured by A & C together in 2 day in April are what percent more or less than shirts manufactured by B & D together in 1 day in April?

- (a) 60% (b) 20% (c) 40% (d) 50% (e) 30%

Direction (71-75): Read the data carefully and answer the questions.

There are 900 players in two PUBG servers 'Asia' & 'Europe' and three levels in each server i.e. Platinum, Gold & Crown. $18\frac{3}{4}\%$ of total players in Asia are in Crown and $28\frac{4}{7}\%$ of total players in Europe are in Gold. Sum of total players in Crown in Asia & Players in Gold in Europe is 210. $19\frac{1}{21}\%$ of total players in Europe are in Crown and 50% of total players in Asia are in Platinum.

71. Total players in Platinum in Asia is what percent more than total players in Gold in Europe?

- (a) 75% (b) 70% (c) 90% (d) 100% (e) 110%

72. Find the ratio of total players in Crown in Europe to total players in Gold in Asia?

- (a) 8 : 15 (b) 8 : 17 (c) 8 : 13 (d) 8 : 11 (e) 8 : 9

73. If in other server 'Middle east' total players are 360 and total players in Gold in Middle east' are 25% more than total players in Crown in Europe, then find total players in Platinum & Crown in 'Middle east' is how much less than total players in Platinum & Crown in Asia?

- (a) 110 (b) 120 (c) 80 (d) 90 (e) 70

74. Find the average number of players in Gold in Asia & Europe?

- (a) 125 (b) 135 (c) 120 (d) 130 (e) 145

75. If out of total players in platinum in Asia & Europe, ratio of boys to girl is 5 : 3 and 7 : 4 respectively, then find total boys in platinum from both servers?

- (a) 220 (b) 260 (c) 290 (d) 270 (e) 250

Direction (76-80): Read the given information carefully and answer the following questions carefully.

There are 3 flight operators Air India, Indigo and Go Air offering services to two destinations from Delhi to Goa and Ooty. A total of 800 passengers travelled on these routes on a particular day of which 60% travelled to Ooty. Indigo because of its lowest fare always travel to its full capacity. All planes have 180 seating capacity each. Air India and Go Air issued same number of boarding passes. Passengers travelled to Ooty from Air India and Go Air are in ratio of 8 : 7.

76. The unoccupied capacity of Air India is what percent of total passengers to Ooty?
 (a) $29\frac{1}{6}\%$ (b) $30\frac{1}{6}\%$ (c) $70\frac{5}{6}\%$ (d) $45\frac{5}{6}\%$ (e) $63\frac{7}{11}\%$
77. What is the average number of passengers travelled to Ooty from Air India and Indigo?
 (a) 240 (b) 140 (c) 170 (d) 160 (e) 180
78. Which flight has maximum unoccupied seats?
 (a) Indigo (b) Air India (c) Go Air
 (d) Air India and Go Air both (e) All have same no. of unoccupied seats
79. What is the ratio of passengers travelled to Ooty from Air India and Go Air together to the passengers travelled to Goa using Indigo and Go Air together?
 (a) 3 : 2 (b) 15 : 13 (c) 17 : 13 (d) 15 : 7 (e) 1 : 1
80. Passengers travelling to Goa using Indigo are what percent more or less than passengers travelling to Ooty using Go Air? (approx.)
 (a) 22 (b) 64 (c) 39 (d) 40 (e) 29

Direction (81- 85): Data given below shows total expense of 'ADDA 247' in three different months.

April → Total salary expense of 160 employees is 20 lakhs

May → Total expense in this month is same as previous month, while salary expense is increased by 26% as compared to previous month and average salary expense is decreased by Rs. 500 as compared to previous month.

June → Total expense is 120 lakhs which is 20% more than that in May. Others expense is 95 lakhs. Number of employees is decreased by 10 as compared to previous month.

Total expense = Salary expense + Others expense

Salary expense = Number of employees × Average salary expense

81. Find difference between other expense (in Rs.) in April & May?
 (a) 5.2 lakhs (b) 5.6 lakhs (c) 5.8 lakhs (d) 6.2 lakhs (e) 4.2 lakhs
82. Total employee working in April is what percent less than total employee working in June?
 (a) 10% (b) 12% (c) 15% (d) 20% (e) 25%
83. Find the ratio of salary expense in May to other expense in April?
 (a) 67 : 200 (b) 61 : 200 (c) 63 : 200 (d) 63 : 400 (e) 63 : 250
84. Total salary expense of ADDA 247 increased by what percent in June over April?
 (a) 5% (b) 10% (c) 15% (d) 25% (e) 20%
85. If average number of employees working in May, June & July is 220, then find number of employees working in ADDA 247 in July?
 (a) 250 (b) 240 (c) 210 (d) 270 (e) 300

Directions (86-90): Study the passage given below and answer the following questions.

Data gives information about total crop production in a village in 2012, 2013, 2014, 2015 & 2016. Ratio of total crop production in 2012 to that of in 2013 is 13 : 20. Total crop production in 2015 is 10% less than that of in 2016 and total crop production in 2015 is equal to average of crop production in 2012 & 2014. Total crop production in 2014 is 60% more than that of in 2013. Average crop production in all these 5 years is 4500 tonnes.

86. Find total crop production in 2015 & 2016 together.
 (a) 8000 tonnes (b) 9500 tonnes (c) 9000 tonnes (d) 7500 tonnes (e) 8500 tonnes

87. If in 2013 village produced only three crops (wheat, rice and bajra) in the ratio 36 : 27 : 17 respectively, then find difference in production of wheat and production of bajra in the village in 2013.
 (a) 850 tonnes (b) 1100 tonnes (c) 750 tonnes (d) 500 tonnes (e) 950 tonnes
88. If village produced only wheat and bajra in 2012 in the ratio 8 : 5 and selling price (per ton) of wheat and bajra in 2012 is Rs.625 and Rs.500 respectively, then find total revenue of village in 2012.
 (a) Rs.10,00,000 (b) Rs.25,00,000 (c) Rs.22,00,000 (d) Rs.15,00,000 (e) Rs.18,00,000
89. In 2016 & 2017 village produced only wheat & rice and ratio of production of wheat to that of rice in the village in 2016 & 2017 is 16 : 9 and 4 : 3 respectively. If production of wheat in village in 2017 is 400 tonnes more than that of in 2016, then find production of rice in the village in 2017 is what percent of that of in 2016?
 (a) 120% (b) 150% (c) 160% (d) 180% (e) 80%
90. Find ratio of total crop production in the village in 2013 to that of in 2014.
 (a) 5 : 8 (b) 3 : 4 (c) 1 : 4 (d) 7 : 10 (e) None of the above.

Directions (91-95): Study the following data carefully to answer the questions that follow:

There are four schools A, B, C and D. Sum of girls in school B and boys in school D is 2600. Ratio of boys in school D to girls in school A is 7 : 8. Total students in school C is 2500 and total students in school A 12% more than total student in school C. Sum of girls in school A and C is 2600.

Difference between boys in school A and boys in school D is 200 where number of boys in school D are more than number of boys in school A. sum of total students in school B and school D is 5800. Boys in school B are $66\frac{2}{3}\%$ more than girls in school D.

91. What is the sum of boys from school B and girls from school C.
 (a) 2850 (b) 3100 (c) 3000 (d) 2800 (e) 2600
92. What is the ratio of total student in school B to the total students in school D.
 (a) 21 : 8 (b) 16 : 13 (c) 15 : 14 (d) 17 : 12 (e) 19 : 10
93. Total girls in school C are what percent more or less than total number of boys in school D.
 (a) $27\frac{1}{7}\%$ (b) $16\frac{2}{3}\%$ (c) $26\frac{4}{7}\%$ (d) $14\frac{2}{7}\%$ (e) $28\frac{4}{7}\%$
94. What is the difference between the average of total girls from all school and average of total boys from all the schools.
 (a) 275 (b) 250 (c) 260 (d) 280 (e) 285
95. If a girl is chosen at random from all the schools then find the probability that chosen girl is from school C.
 (a) $\frac{1}{11}$ (b) $\frac{2}{9}$ (c) $\frac{7}{18}$ (d) $\frac{1}{5}$ (e) $\frac{1}{7}$

Directions (96-100): Study the following details given below and answer the questions accordingly:

Population of a town is 18000. Respective ratio of males and females among them is 7:5. Total population of the town is divided into four different groups A,B,C and D. 25 % of the males are in group C. Respective ratio of the number of the males in group C and number of the females in group B is 35:36.

Number of females in group D is 40% less than number of females in group B. Respective ratio of the numbers of females in group D and number of males in group A is 9:10. Respective ratio of the number of males and females in group B is 8:9. Number of females in group C is 20% less than the number of males in group A.

Note: Total Population=(Male + Female)

96. Total number of males in group A and B together is what percent of total number of females in the town?
 (a) 60 % (b) 56 % (c) 65 % (d) 70 % (e) 50 %
97. Find the difference between total number of person in Group B and total number of persons in group C?
 (a) 1065 (b) 1080 (c) 1035 (d) 1120 (e) 1240
98. The average numbers of male population in group C and D together to is what percent more than total female populations of group B?
 (a) $16\frac{2}{3}\%$ (b) $14\frac{2}{7}\%$ (c) $12\frac{1}{2}\%$ (d) 20 % (e) $33\frac{1}{3}\%$

99. If a new group E is formed in which number of males and females population is 10% and 15% more than males and females population of group B respectively, then find total population of group E?
 (a) 5775 (b) 6150 (c) 5745 (d) 6300 (e) 5600
100. Average males population of group A and B together is how much more/less than average female population of Group C and D together?
 (a) 590 (b) 650 (c) 535 (d) 570 (e) 700

Practice MCQs for Prelims (Solutions)

Sol. (1-5):

$$\frac{\text{Total produced unit of Fans}}{\text{total produced units of refrigerator}} = \frac{375}{100} \times$$

$$\frac{\text{Total produced units of TVs}}{\text{total produced units of refrigerator}} = 2 \times$$

$$\text{Total produced units of refrigerator} = 160 \times \frac{100}{20} = 800 \text{ units}$$

$$\text{So, total no. of fans produced} = \frac{375}{100} \times 800 = 3000 \text{ units}$$

$$\text{And total TVs produced} = 2 \times 800 = 1600 \text{ units}$$

$$\text{Faulty units of TV} = 160 \times \frac{6}{4} = 240 \text{ units}$$

$$\text{Faulty units of Fans} = 160 \times \frac{13}{4} = 520 \text{ units}$$

1. (c): required difference = $(1600 - 240) - 520$
 $= 1360 - 520 = 840 \text{ units}$

2. (a): required average
 $= \frac{(3000-520)+(800-160)+(1600-240)}{3} = \frac{2480+640+1360}{3}$
 $= \frac{4480}{3} = 1493 \text{ units}$

3. (d): total cost price of Fans = $2500 \times 3000 = \text{Rs } 7500000$
 And total selling price = $3000 \times (3000 - 520) = \text{Rs } 7440000$
 So, required percentage = $\frac{(7500000-7440000)}{7500000} \times 100$
 $= \frac{60000}{7500000} \times 100 = 0.8\% \text{ loss}$

4. (b): total no. of produced units of Refrigerator = 800

5. (e): required ratio = $\frac{520}{1600-240} = \frac{520}{1360} = \frac{13}{34}$

Sol (6-10): -

For city C

$$\text{Total population of city C} = \frac{6000}{6.25} \times 100 = 96000$$

$$\text{Literate population of city C} = 96000 \times \frac{2}{3} = 64000$$

$$\text{Illiterate population} = 96000 \times \frac{1}{3} = 32000$$

$$\text{Graduate population} = 64000 \times \frac{40}{100} = 25600$$

For city B

$$\text{Total population} = 16000$$

$$\text{Literate population} = 6000$$

$$\text{Illiterate population} = 16000 - 6000 = 10000$$

$$\text{Graduate population} = 6000 \times \frac{40}{100} = 2400$$

For city A

$$\text{Total population} = 22000$$

$$\text{Literate population} = 22000 \times \frac{5}{11} = 10000$$

$$\text{Illiterate population} = 22000 - 10000 = 12000$$

$$\text{Graduate population} = 10000 \times \frac{40}{100} = 4000$$

6. (c): Required percentage = $\frac{6000}{12000} \times 100 = 50\%$

7. (d): Required ratio = $25600:16000 = 8:5$

8. (a): Required difference = $32000 - 2400 = 29600$

9. (b): Population which is literate but ungraduated from city A = $10000 \times \frac{60}{100} = 6000$
 Required percentage = $\frac{6000}{2400} \times 100 = 250\%$

10. (c): Graduate male from city C = $\frac{25600}{16} \times 9 = 14400$
 Literate but ungraduated from city B = $6000 \times \frac{60}{100} = 3600$
 Required difference = $14400 - 3600 = 10800$

Sol. (11-15)

$$\text{Total no. of boys participated} = 3500 \times \frac{9}{14} = 2250$$

$$\text{Total no. of girls participated} = 3500 - 2250 = 1250$$

$$\text{No. of boys participated in Badminton} = \frac{30}{100} \times 2250 = 675$$

$$\text{No. of girls participated in Cricket} = 675 \times \frac{100}{125} = 540$$

$$\text{No. of boys participated in Cricket} = 1265 - 540 = 725$$

$$\text{No. of boys participated in Football} = 2250 - 675 - 725 = 850$$

$$\text{No. of girls participated in Badminton and Football} = 1250 - 540 = 710$$

$$\text{No. of girl participated in Badminton} = \text{No. of girls participated in Football} + 10$$

$$\text{So, no. of girls participated in Badminton} = 360$$

$$\text{And no. of girls participated in Football} = 350$$

11. (a): required no. = $675 + 360 = 1035$

12. (d): Required percentage = $\frac{850-350}{350} \times 100 = 142\frac{6}{7}\%$

13. (c): Required ratio = $\frac{725}{350} = \frac{29}{14}$

14. (d): required percentage = $\frac{360}{540} \times 100 = \frac{200}{3} \% = 66\frac{2}{3} \%$

15. (e): Required difference = $850 - 350 = 500$

Sol. (16-20)

let expenditure of Deepak, Ankit and Shivam are Rs. 2x, 5x and 3x respectively

Saving of Ankit = $5x \times \frac{200}{100} = \text{Rs. } 10x$

Let saving of Deepak and Shivam are Rs.10y and 7y respectively.

Income of Ankit = $10x + 5x = \text{Rs. } 15x$

Income of Shivam = Rs. (3x + 7y)

ATQ

$10x + 7y = 2 \times 8500$

$10x + 7y = 17000$ (i)

And $\frac{15x}{3x+7y} = \frac{3}{2}$

$30x = 9x + 21y$

$x = y$ (ii)

Using (i) and (ii)

$x = 1000$ and $y = 1000$

Name	Income	Expenditure	Saving
Deepak	12000	2000	10000
Ankit	15000	5000	10000
Shivam	10000	3000	7000

16. (b): New saving of Deepak = $12000 \times \frac{110}{100} - 2000 \times \frac{120}{100}$
 $= 13200 - 2400 = 10800$

Required percentage = $\frac{10800 - 10000}{10000} \times 100 = 8\%$

17. (c): required percentage = $\frac{3000}{10000} \times 100 = 30\%$

18. (e): Required ratio = $\frac{1}{2} \times (10000 + 10000) : 10000$
 $= 10000 : 10000 = 1 : 1$

19. (a): Expenditure on other expenses = $5000 - 15000 \times \frac{15}{100} - 5000 \times \frac{35}{100} = \text{Rs. } 1000$

20. (b): Required average
 $= \frac{1}{3} \times (12000 + 10000 + 15000)$
 $= \frac{37000}{3} = \text{Rs. } 12333.33$

Sol. (21-25):

Marks of C = $\frac{50}{100} \times 200 = 100$

Marks of E = $\frac{100}{125} \times 100 = 80$

Marks of B = marks of E = 80

Marks of D = $\frac{162.5}{100} \times 80 = 130$

Marks of A = $\frac{12}{8} \times 80 = 120$

Marks of F = $\frac{9}{8} \times 80 = 90$

21. (c): highest marks scored by D.

22. (a): passing marks = $\frac{40}{100} \times 200 = 80$

Required % = $\frac{130-80}{80} \times 100 = 62.5\%$

23. (e): required ratio = $80 : 130 : 90 = 8 : 13 : 9$

24. (b): required average = $\frac{120+80+100+130+80+90}{6} = 100$

25. (d): since X scores more marks than B but less than A
 $80 < X < 120$

or, $40\% < X < 60\%$

Only possible marks, $45\% = 90$ & $54\% = 108$

Sol (26-30):

Let boys in P be 20x.

So, boys in R = $20x \times \frac{105}{100} = 21x$

Let number of boys in Q & S be 3y & 2y respectively.

New, girls in P = 20x

Girls in R = $21x \times \frac{100}{200}$

$= 10.5x$

And girls in Q = $20x - 76$

And girls in S = $(20x - 76) \times \frac{2}{3}$

ATQ,

$(20x - 76) + 10.5x + (20x - 76) \times \frac{2}{3} = 250 \times 3$

$30.5x - 76 + \frac{40x}{3} - \frac{152}{3} = 750$

$\Rightarrow \frac{263x}{6} = \frac{2630}{3}$

$\Rightarrow x = 20$

Now,

$(3y + 20x - 76) - [2y + (20x - 76) \times \frac{2}{3}] = 180$

$\Rightarrow 3y + 324 - 2y - 216 = 180$

$\Rightarrow y = 72$

School	Boys	Girls	Total Students
P	400	400	800
Q	216	324	540
R	420	210	630
S	144	216	360

26. (b): Required % = $\frac{(324+216)-400}{400} \times 100 = \frac{140}{4} = 35\%$

27. (c): Required difference = $(540 + 630) - (800 + 360) = 10$

28. (b): Required % = $\frac{(216+144)}{800} \times 100 = 45\%$

29. (d): Required ratio = $\frac{\frac{1}{3} \times (216+420+144)}{540}$
 $= \frac{260}{540} = 13 : 27$

30. (c): Required % = $\frac{400 - (144+210)}{400} \times 100$
 $= \frac{46}{4} \% = 11.5\%$

Sol. (31-35):

Pen drives sold by company = 4500

Mobiles sold by company = $\frac{4500}{250} \times 100 = 1800$

Keyboards sold by company = $4500 - 1000 = 3500$

Hard drives sold by company

= $3000 \times 2 - 3500 = 6000 - 3500 = 2500$

So, Laptop and Printer sold by company are 1600 and 2100 respectively.

31. (b): The no. of units of Printers sold by company = 2100

32. (d): required average = $\frac{1800+4500+2100}{3} = \frac{8400}{3} = 2800$

33. (c): company sold 4500 units of pen drives, which is maximum.

34. (d): required percent = $\frac{(3500-2100)}{3500} \times 100$
 $= \frac{1400}{3500} \times 100 = 40\%$

35. (c): required ratio = $\frac{(2500+4500)}{(1800+2100)} = \frac{7000}{3900} = \frac{70}{39}$

Sol (36-40):

Let students in Class - II be $2x$.

So, students in Class - IV = $\frac{150}{100} \times 2x = 3x$

Students in Class - III = $(10 + 2x)$

Students in Class - V = $\frac{80}{100} \times 3x = 2.4x$

Students in Class - I = $2.4x \times \frac{15}{16} = 2.25x$

ATQ,

$2.25x + 2x + (10 + 2x) + 3x + 2.4x = 243$

$11.65x = 233$

$x = 20$

Class	Total students
I	45
II	40
III	50
IV	60
V	48

36. (a): Girls in Class - I & IV together = $(45 \times \frac{2}{5}) + (60 \times \frac{7}{15}) = 18 + 28 = 46$
 Required % = $\frac{46}{40} \times 100 = 115\%$

37. (e): Students who play football in Class - III & V together = $(50 \times \frac{1}{5}) + (48 \times \frac{3}{8}) = 10 + 18 = 28$
 Students who play cricket in Class - III & V together = $(50 \times \frac{2}{5}) + (48 \times \frac{3}{8}) = 20 + 18 = 38$
 Required ratio = $\frac{28}{38} = 14 : 19$

38. (b): Number of boys in Class - II = $40 \times \frac{3}{5} = 24$

Number of girls in Class - II = $40 - 24 = 16$

Required average weight = $\frac{((24 \times 40) + (16 \times 25))}{24 + 16}$
 $= \frac{960 + 400}{40} = 34 \text{ kg}$

39. (b): Required average = $\frac{(40+50+48)}{3} = 46$

40. (d): Total students in Class - VI = $\frac{150}{100} \times (\frac{40+48}{2}) = 66$
 Required difference = $66 - 60 = 6$

Sol (41-45):

Let the number of pen and pencil sold by A be $7x$ and $5x$ respectively and that of by B be $3y$ and $2y$ respectively.

Total numbers of pen and pencil sold by A and B = $7x + 5x + 3y + 2y$

$12x + 5y = 874 - 128$

$12x + 5y = 746$

Now,

$7x = 3y \times \frac{110}{100}$

$x = \frac{33y}{70}$

$12x + 5y = 746$

$12 \times \frac{33y}{70} + 5y = 746$

$396y + 350y = 746 \times 70$

$y = \frac{746 \times 70}{746} = 70$

$x = \frac{33y}{70} = \frac{33 \times 70}{70} = 33$

	A	B	C
Pen	$7x = 7 \times 33 = 231$	$3y = 3 \times 70 = 210$	$5z = \frac{128}{8} \times 5 = 80$
Pencil	$5x = 5 \times 33 = 165$	$2y = 2 \times 70 = 140$	$3z = \frac{128}{8} \times 3 = 48$

41. (c): Total amount received by selling all pen by A = $231 \times 20 = \text{Rs } 4620$

Total amount received by selling all pencil by A = $165 \times 10 = \text{Rs } 1650$

Total amount earned by selling all pen & pencil by A = $4620 + 1650 = \text{Rs } 6270$

42. (b): Total pens sold by A and B together = $231 + 210 = 441$

Total pencil sold by B and C together = $140 + 48 = 188$

Required ratio = $\frac{441}{188} = 441:188$

43. (d): Required average = $\frac{231+210+80}{3} = \frac{521}{3} = 173.67$

- 44. (a):** number of pens sold by stationary B after increase of 20 % = $210 \times \frac{120}{100} = 252$
 number of pencil sold by stationary C after increase of 25 % = $48 \times \frac{125}{100} = 60$
 Required sum of pen and pencil = $252 + 60 = 312$

- 45. (c):** Total pens sold by A, B and C together = $231 + 210 + 80 = 521$
 Total pencils sold by A, B and C together = $165 + 140 + 48 = 353$
 Required difference = $521 - 353 = 168$

Sol. (46-50):

Number of passengers in train P = 800

Number of passengers in train Q = $800 \times 1.4 = 1120$

Number of passengers of train P in general coaches = 160

Number of passengers of train P in AC coaches = 200

Number of passengers of train P in sleeper coaches = 200

Number of passengers of train P in first class coaches = 240

Number of passengers of train Q in AC coaches = 280

Number of passengers of train Q in sleeper coaches = $1120 \times 0.45 = 504$

Number of passengers of train Q in first class coaches = $336 \times \frac{3}{7} = 144$

Number of passengers of train Q in general class coaches = 192

Coaches	General	Sleeper	AC	First class	Total
Train P	160	200	200	240	800
Train Q	192	504	280	144	1120
Total	352	704	480	384	

- 46. (c):** Required ratio = $\frac{352}{480} = 11:15$

- 47. (a):** Required % = $\frac{280}{504} \times 100 = 55\frac{5}{9}\%$

- 48. (e):** Required % = $\frac{480-360}{480} \times 100$
 $\frac{120}{480} \times 100 = 25\%$

- 49. (b):** Required average = $\frac{704+384}{2} = 544$

- 50. (a):** Required % = $\frac{704-352}{1920} \times 100 = 18\frac{1}{3}\%$

Sol. (51-55):

Let the number of female passengers be 100x.

Then, the number of male passengers

$$= 100x \times \frac{175}{100} = 175x$$

The number of female passengers who like Coffee

$$100x \times \frac{160}{3 \times 100} = 320$$

$$x = 6$$

Number of total female passengers = $6 \times 100 = 600$

Number of total male passengers = $175 \times 6 = 1050$

Number of passengers who like Tea

$$= \frac{1650 \times 61}{165} = 610$$

Number of passengers who like coffee

$$= \frac{1650 \times 67}{165} = 670$$

Number of passengers who like Lassi = $1650 - (610 + 670) = 370$

Number of female who like Tea = $(600 - 320) \times \frac{4}{7} = 160$

Number of male who like Lassi = $600 - (320 + 160) = 120$

Let the number of male passengers who like coffee be 7y

Then, number of male passengers who like tea

$$= 7y \times \frac{9}{7} = 9y$$

Number of male passengers who like Lassi

$$= \frac{9y}{9} \times 5 = 5y$$

ATQ,

$$7y + 9y + 5y = 1050$$

$$y = 50$$

Passengers	Tea	Coffee	Lassi	Total
Male	450	350	250	1050
Female	160	320	120	600
Total	610	670	370	1650

- 51. (b):** Required difference = $250 - 160 = 90$

- 52. (a):** Total no. of female passengers who like Tea and Lassi together = $160 + 120 = 280$

$$\text{Required \%} = \frac{350-280}{350} \times 100 = 20\%$$

- 53. (c):** Required avg. = $\frac{610+670}{2} = \frac{1280}{2} = 640$

- 54. (c):** Required ratio = $\frac{610+370}{1050} = \frac{980}{1050} = \frac{14}{15}$

- 55. (b):** Required % = $\frac{350+160}{1650} \times 100$

$$= \frac{510}{1650} \times 100\%$$

$$= 30\frac{10}{11}\%$$

Sol (56-60):

Number of students selected in Dena bank

$$= \frac{25}{300} \times 1500 = 125$$

Number of students selected in Allahabad bank

$$= \frac{125}{\left(1 - \frac{50}{300}\right)} = 150$$

Number of students selected in Corporation bank = $240 + 35 = 275$

Number of students selected in Canara bank

$$= 275 \times \frac{8}{11} = 200$$

Canara bank + Dena bank + SBI = $3 \times 215 = 645$

So, number of students selected in SBI = $645 - (200 + 125) = 320$

Number of students selected in PNB = $1500 - (125 + 240 + 150 + 275 + 200 + 320)$
 $= 1500 - 1310 = 190$

56. (b): Required ratio = $\frac{200}{240} = \frac{5}{6}$

57. (a): Required percentage = $\frac{(320-240)}{240} \times 100 = 33.33\%$

58. (a): Required difference
 $= 275 - \frac{(200+190+150)}{3} = 275 - \frac{540}{3}$
 $= 275 - 180 = 95$

59. (d): Required percentage = $\frac{275}{125} \times 100 = 220\%$

60. (e): Number of students selected in SBI = 320

Sol (61-65):

In company X:

Total no. of employees in company X = $\frac{4}{7} \times 5600 = 3200$

No. of males in company X = $\frac{60}{100} \times 3200 = 1920$

No. of males in Administration = $\frac{30}{100} \times 1920 = 576$

No. of males in HR = $\frac{2}{7} \times (1920 - 576) = 384$

No. of males in Others = $1920 - 576 - 384 = 960$

No. of females in HR = $\frac{40}{100} \times 3200 \times \frac{3}{8} = 480$

Let no. of females in administration = x

$$x + x + 50 = \frac{40}{100} \times 3200 - 480$$

$$x = 375$$

No. of females in Others = $1280 - 480 - 375 = 425$

In company Y:

Total no. of employee in Company Y = $\frac{3}{7} \times 5600 = 2400$

No. of males in company Y = $\frac{65}{100} \times 2400 = 1560$

No. of females in HR = $\frac{420}{120} \times 100 = 350$

No. of males in Administration = $\frac{3}{4} \times 420 = 315$

No. of males in Others = $1560 - 315 - 420 = 825$

No. of females in Others = $(2400 - 1560) - 350 - 250 = 240$

61. (c): required no. = $576 + 315 = 891$

62. (b): required percentage = $\frac{420}{480} \times 100 = 87.5\%$

63. (e): required ratio = $\frac{960}{420} = \frac{16}{7}$

64. (a): required difference = $1920 - 840 = 1080$

65. (d): required percentage = $\frac{825-375}{825} \times 100 = 54.54\%$

Sol (66-70):

Total shirts manufactured by company in April = $2490 \times \frac{100}{83} = 3000$

Let shirts manufactured by C in April be $40x$.

So, shirts manufactured by A in April = $40x \times \frac{75}{100} = 30x$

Now, shirts manufactured by B in April = $40x \times \frac{5}{2} = 100x$

Shirts manufactured by E in April = $40x + 150$

And shirts manufactured by D in April = $(650 \times 2) - (40x + 150)$

$$= 1300 - 40x - 150 = 1150 - 40x$$

ATQ,

$$30x + 100x + 40x + 1150 - 40x + 40x + 150 = 3000$$

$$170x + 1300 = 3000$$

$$170x = 1700$$

$$x = 10$$

Employee	Shirts manufactured in April
A	300
B	1000
C	400
D	750
E	550

66. (b): Required% = $\frac{300 + 400}{1000} \times 100 = 70\%$

67. (e): Required difference = $\frac{750 - 550}{25} = 8$

68. (c): Required average = $\frac{1000 + 400 + 550}{3} = \frac{1950}{3} = 650$

69. (b): Profit earned by company on each shirt = $32 \times \frac{25}{100} = \text{Rs. } 8$

$$\text{Required profit} = 2490 \times 8 = \text{Rs. } 19920$$

70. (b): Shirts manufactured by A & C together in 2 day in

$$\text{April} = \frac{300 + 400}{25} \times 2 = 56$$

Shirts manufactured by B & D together in 1 day in April

$$= \frac{1000 + 750}{25} = 70$$

$$\text{Required \%} = \frac{70-56}{70} \times 100 = 20\%$$

Sol. (71-75):

Let total players in Asia = a

And, total players in Europe = b

$$\text{Total players in Crown in Asia} = a \times \frac{75}{4} \times \frac{1}{100} = \frac{3a}{16}$$

$$\text{Total players in Gold in Europe} = b \times \frac{200}{7} \times \frac{1}{100} = \frac{2b}{7}$$

$$\text{Given, } \frac{3a}{16} + \frac{2b}{7} = 210 \text{ ----- (i)}$$

$$\text{And } a + b = 900 \text{ ----- (ii)}$$

So, from (i) and (ii),

Total players in Asia = 480

And total players in Europe = 420

$$\text{Total players in Crown in Europe} = \frac{400}{21} \times \frac{1}{100} \times 420 = 80$$

$$\text{Total players in Platinum in Asia} = \frac{1}{2} \times 480 = 240$$

$$\text{Now, total players in Gold in Asia} = 480 - \frac{3}{16} \times 480 - 240 = 150$$

And total players in Platinum in Europe = $420 - \frac{2}{7} \times 420 - 80 = 220$

Levels	Asia	Europe
Platinum	240	220
Crown	90	80
Gold	150	120
Total	480	420

71. (d): Required percentage = $\frac{240-120}{120} \times 100 = 100\%$

72. (a): Required ratio = $\frac{80}{150} = 8 : 15$

73. (e): Total players in Platinum & Crown in 'Middle east'
 $= 360 - 80 \times \frac{125}{100} = 260$
 Required difference = $(240 + 90) - 260 = 70$

74. (b): Required average = $\frac{150+120}{2} = \frac{270}{2} = 135$

75. (c): boys in platinum from both servers = $240 \times \frac{5}{8} + 220 \times \frac{7}{11} = 150 + 140 = 290$

Sol. (76-80)

Total passengers = 800

(since, Indigo always travel fully occupied & each plane has 180 seats)

Passengers travelled to Ooty from Indigo = 180

Passengers travelled to Goa from Indigo = 180

Passengers travelling to Ooty = $\frac{60}{100} \times 800 = 480$

Passengers travelling to Goa = $\frac{40}{100} \times 800 = 320$

Air India and Go Air have issued same no. of boarding passes

Passengers using Air India = Passengers using Go Air
 $= \frac{800-360}{2} = 220$

Passengers travelled to Ooty using Air India
 $= \frac{480-180}{15} \times 8 = 160$

Passengers travelled to Ooty using Go Air = $480 - (160 + 180) = 140$

Passengers travelling to Goa using Air India = $220 - 160 = 60$

Passengers travelling to Goa using Go Air = $220 - 140 = 80$

Flight Operator	Total Passengers	Passengers to Ooty	Passengers to Goa
Air India	220	160	60
Indigo	360	180	180
Go Air	220	140	80
Total Passengers	800	480	320

76. (a): Unoccupied capacity of Air India = $180 + 180 - 160 - 60 = 140$

Total passengers to Ooty = 480

Required percentage = $\frac{140}{480} \times 100 = 29\frac{1}{6}\%$

77. (c): Required average = $\frac{160+180}{2} = 170$

78. (d): Unoccupied seats

Air India = $180 + 180 - 160 - 60 = 140$

Indigo = $180 + 180 - 180 - 180 = 0$

Go Air = $180 + 180 - 140 - 80 = 140$

79. (b): Required ratio = $\frac{160+140}{180+80} = \frac{300}{260} = 15 : 13$

80. (e): required % = $\frac{180-140}{140} \times 100 = 28.57 = 29\%$

(approx.): **(81-85):**

In April, average salary expense

$= \frac{2000000}{160} = 12500$ Rs.

In May, Average salary expense

$= 12500 - 500 = 12000$ Rs.

Given, total expense in June = 120 lakhs

Total expense in April & May each = 12000000
 $\times \frac{100}{120} = 10000000$ Rs.

Total salary expense in June = $120 - 95 = 25$ lakhs

Total salary expense in May = $2000000 \times \frac{126}{100} = 2520000$ Rs.

Number of employees working in ADDA 247 in

May = $\frac{2520000}{12000} = 210$

Number of employees working in ADDA 247 in June = $210 - 10 = 200$

In June, average salary expense

$= \frac{2500000}{200} = 12500$ Rs.

Months	Average salary expense (in Rs.)	Number of employees	Salary Expense (in Rs.)	Other expense (in Rs.)	Total expense (in Rs.)
April	12500	160	20 lakhs	80 lakhs	100 lakhs
May	12000	210	25.2 lakhs	74.8 lakhs	100 lakhs
June	12500	200	25 lakhs	95 lakhs	120 lakhs

81. (a): Required difference = $80 - 74.8 = 5.2$ lakhs

82. (d): Required percentage = $\frac{200-160}{200} \times 100$
 $= \frac{40}{200} \times 100 = 20\%$

83. (c): Required ratio = $\frac{2520000}{8000000} = 63 : 200$

84. (d): Required percentage = $\frac{25-20}{20} \times 100$
 $= \frac{5}{20} \times 100 = 25\%$

85. (a): Number of employees working in ADDA 247 in July = $3 \times 220 - 210 - 200$
 $= 660 - 210 - 200 = 250$

Sol (86-90):

Let total crop production in 2012 & 2013 be $13x$ tonnes and $20x$ tonnes respectively.

Now, total crop production in 2014 = $\frac{160}{100} \times 20x = 32x$

Now, total crop production in 2015 = $\frac{13x+32x}{2} = 22.5x$

And, total crop production in 2016 = $22.5x \times \frac{100}{90} = 25x$

ATQ,

$$\frac{13x+20x+32x+22.5x+25x}{5} = 4500$$

$$\Rightarrow x = 200$$

Year	Total crop production (in tonnes)
2012	2600
2013	4000
2014	6400
2015	4500
2016	5000

86. (b): Total crop production in 2015 & 2016 together
= $4500 + 5000 = 9500$ tonnes

87. (e): Required difference = $\frac{36-17}{36+27+17} \times 4000 = 950$ tonnes

88. (d): Required revenue
= $\left(2600 \times \frac{8}{8+5} \times 625\right) + \left(2600 \times \frac{5}{8+5} \times 500\right)$
= $10,00,000 + 5,00,000$
= Rs.15,00,000

89. (b): Let production of wheat and rice in the village in 2017 be $4x$ tonnes and $3x$ tonnes respectively.

ATQ,

$$4x - \left(5000 \times \frac{16}{16+9}\right) = 400$$

$$\Rightarrow x = 900$$

$$\text{Hence, required percentage} = \frac{3 \times 900}{5000 \times \frac{9}{25}} \times 100 = 150\%$$

90. (a): Required ratio = $\frac{4000}{6400} = 5 : 8$

Sol (91-95):

Let total number of boys in school D = x

So total number of girls in school B = $2600 - x$

$$\text{Girls in school A} = \frac{x}{7} \times 8 = \frac{8x}{7}$$

$$\text{Total students in school A} = \frac{112}{100} \times 2500 = 2800$$

$$\text{Girls in school C} = 2600 - \frac{8x}{7}$$

$$\text{Boys in school A} = x - 200$$

Sum of total students in school B and school D = 5800

Let girls in school D = y

$$\text{So, boys in school B} = \frac{5}{3}y$$

School	Total	Boys	Girls
A	2800	$x - 200$	$\frac{8x}{7}$
B		$\frac{5}{3}y$	$2600 - x$
C	2500		$2600 - \frac{8}{7}x$
D		x	y

So,

$$x - 200 + \frac{8x}{7} = 2800$$

$$7x - 1400 + 8x = 2800 \times 7$$

$$15x = 21000$$

$$x = 1400$$

$$\text{Boys in school A} = x - 200 = 1200$$

$$\text{Girls in school A} = \frac{8}{7}x$$

$$= \frac{8}{7} \times 1400 = 1600$$

$$\text{Girls in school B} = 2600 - x$$

$$= 2600 - 1400 = 1200$$

$$\text{Girls in school C} = 2600 - \frac{8}{7}x$$

$$= 2600 - \frac{8}{7} \times 1400$$

$$= 1000$$

$$\text{Boys in school C} = 2500 - 1000$$

$$= 1500$$

$$\text{Boys in school D} = 1400$$

Now

$$\frac{5}{3}y + 2600 - x + x + y = 5800$$

$$\frac{8}{3}y + 1200 + 1400 = 5800$$

$$y = 1200 \text{ (Girls in school D)}$$

$$\text{Boys in school B} = 2000$$

Schools	Total	Boys	Girls
A	2800	1200	1600
B	3200	2000	1200
C	2500	1500	1000
D	2600	1400	1200

91. (c): Required sum = $2000 + 1000 = 3000$

92. (b): Required ratio = $32 : 26 = 16 : 13$

$$\begin{aligned} \text{93. (e): Required percentage} &= \frac{1400-1000}{1400} \times 100 \\ &= \frac{4}{14} \times 100 = 28\frac{4}{7}\% \end{aligned}$$

$$\begin{aligned} \text{94. (a): Required difference} &= \frac{(1200+2000+1500+1400)}{4} - \frac{(1600+1200+1000+1200)}{4} \\ &= 1525 - 1250 = 275 \end{aligned}$$

$$\text{95. (d): Required probability} = \frac{1000}{5000} = \frac{1}{5}$$

Sol (96-100):

Total population of the town = 18000

Total number of males = $\frac{7}{12} \times 18000 = 10500$

Total number of females = $\frac{5}{12} \times 18000 = 7500$

Number of males in group C = $10500 \times \frac{25}{100} = 2625$

Number of females in group B = $2625 \times \frac{36}{35} = 2700$

Number of females in group D = $2700 \times \frac{60}{100} = 1620$

Number of males in group A = $1620 \times \frac{10}{9} = 1800$

Number of males in group B = $2700 \times \frac{8}{9} = 2400$

Number of females in group C = $1800 \times \frac{80}{100} = 1440$

Number of males in group D = $10500 - 1800 - 2400 - 2625 = 3675$

Number of females in group A = $7500 - 2700 - 1440 - 1620 = 1740$

96. (b): Total number of males in A and B together = $1800 + 2400 = 4200$

Total number of females = 7500

Required percentage = $\frac{4200}{7500} \times 100 = 56\%$

97. (c): Total number of persons in group B = $2400 + 2700 = 5100$

Total number of persons in group C = $1440 + 2625 = 4065$

Required difference = $5100 - 4065 = 1035$

98. (a): Average number of males in group C and D = $\frac{2625 + 3675}{2} = 3150$

Number of females in group B = 2700

Required percentage = $\frac{3150 - 2700}{2700} \times 100 = 16\frac{2}{3}\%$

99. (c): Total number of males in E = $2400 \times \frac{110}{100} = 2640$

Total number of females in E = $2700 \times \frac{115}{100} = 3105$

Total population of group E = $2640 + 3105 = 5745$

100. (d): Average number of males in group A and B = $\frac{1800 + 2400}{2} = 2100$

Average number of females in group C and D = $\frac{1440 + 1620}{2} = 1530$

Required difference = $2100 - 1530 = 570$

Practice MCQs for Mains

Directions (1-5): Read the passage given below and answer the following questions.

Passage gives information about 3 different types of soaps (LUX, Pears & Dove) sold by a store in 2017, 2018 & 2019. Units of Dove sold in 2017 are 150% more than units of LUX sold in 2017. Ratio of units of Pears sold in 2017 to units of LUX sold in 2018 is 3 : 4. Average of units of Pears sold in all the given 3 years is 550. In 2017, total units sold of all 3 types of soaps are 57.5% of that of in 2019.

Sum of units of LUX and Pears sold in 2018 is 1100. Units of Pears sold in 2019 are $55\frac{5}{9}\%$ more than units of Pears sold in 2017. Units of LUX sold in 2017 are 500 less than units of Pears sold in 2019. Units of Dove sold in 2019 are 500. Units of Dove sold in 2018 are 150% of units of Dove sold in 2019.

- What is the sum of units of LUX and Dove sold by the store in 2018?
(a) 1350 (b) 1345 (c) 1340 (d) 1355 (e) 1330
- Total units of Pears & Dove sold in 2019 together is what percent more or less than units of LUX sold in 2017 & 2018 together.
(a) 90% (b) 20% (c) 80% (d) 120% (e) 50%
- What is the ratio of units of LUX sold in 2019 to units of Dove sold in 2018.
(a) 16 : 15 (b) 5 : 4 (c) 19 : 12 (d) 3 : 2 (e) None of the above.
- Units sold of LUX, Pears and Dove together in 2018 are how much more or less than units sold of LUX and Pears together in 2019?
(a) 300 (b) 500 (c) 350 (d) 450 (e) 400
- Units of Dove sold in 2017 & 2019 together are what percent of units of Pears and Dove sold in 2018 together?
(a) 80% (b) 120% (c) 75% (d) 100% (e) 150%

Direction (6-8): Read the data carefully and answer the questions.

Data given is about the sales of three different brands of mobile phone (**Redmi, Honor & Samsung**) by three shops **A, B & C**.

Number of total mobiles sold by **C** is 100% more than total **Honor** phones sold by **C** and total mobiles sold by all three shops is 1440. Total mobile sold by **A** is 520 and total mobile sold by **C** is 480. Total number of **Redmi mobiles** sold by **A** is 20 more than total Samsung mobile sold by **C** and total **Samsung** mobiles sold by **A** is $\frac{4}{13}$ th of total mobiles sold by **A**.

Redmi mobiles sold by **C** is 30% of total Samsung mobile sold by **A** and total Redmi mobiles sold by **B** is 8 more than total **Redmi** mobiles sold by **C**. The total **Honor** mobiles sold by **B** is $45\frac{5}{11}\%$ of total mobiles sold by **B**.

6. Find total number of Redmi mobiles sold by all three shops?
(a) 306 (b) 316 (c) 296 (d) 326 (e) 336
7. Total Honor mobile sold by B & C together is what percent of total Samsung mobiles sold by A?
(a) 250% (b) 225% (c) 270% (d) 275% (e) 265%
8. Find the ratio of total Samsung mobile sold by B & C together to total Honor mobiles sold by A, B & C together?
(a) 94 : 147 (b) 94 : 149 (c) 94 : 151 (d) 94 : 153 (e) None of these

Directions (9-13): Data given below gives the information regarding four different products A, B, C and D (in units) sold by a company in year 2014 and 2015. Read the data carefully to answer the following questions.

In 2014 – Ratio of units sold of product A to product D is 2 : 1. Units sold of product C is 144% of units sold of product D. Average number of units sold of product A, C and D is 370 units. Total units sold of product A, B, C and D is 1340 units.

In 2015 – Average number of units sold of product C & D is 475 units. Units sold of product A is 75 units less than the units sold of product D. Units sold of product B is increased by 40% as compared to previous year and average units sold of product B & D is 411 units.

9. Find the percentage change in units sold of product A in 2015 as compared to previous year.
(a) 15% increase (b) 15% decrease (c) $17\frac{11}{17}\%$ increase (d) $17\frac{11}{17}\%$ decrease (e) None of the above.
10. Find the ratio of units sold of product A & D together in 2014 to units sold of product C & D together in 2015.
(a) 15 : 19 (b) 12 : 17 (c) 5 : 3 (d) 9 : 7 (e) 11 : 6
11. Find the difference in average units sold of product A, B, C and D in 2014 and average units sold of product A, B, C and D in 2015.
(a) 67.25 (b) 73.25 (c) 82.25 (d) 87.25 (e) 89.25.
12. In 2014, selling price of per unit of product D is Rs.12 and selling price of per unit of product B is Rs.15. Find total revenue generated from product B in 2014 is what percent of total revenue generated from product D in 2014?
(a) 125% (b) 145% (c) 135% (d) 115% (e) 105%
13. Units sold of product B & C together in 2014 is what percent more than units sold of product – D in 2015?
(a) 12% (b) 30% (c) 24% (d) 18% (e) 36%

Direction (14-18): Read the data carefully and answer the questions.

Number of movies did by Salman khan in 2015 is 600 and number of movies did by Sharukh khan and Amir khan in 2017 are in ratio of 5 : 4. Total number of movies did by all in 2016 is 250% more than number of movies did by Amir khan in 2016. Total movie did by Sharukh khan in all three years is 1300. Average of movies did by all in 2017 is $\frac{4}{3}$ th of movies did by Amir khan in 2015. Total movies did by Amir khan in 2016 is $\frac{2}{5}$ th of movie did by Salman khan in 2015 and total movies did by all in 2015 is six times of total movies did by Amir khan in 2016. Total movies did by Sharukh khan in 2015 is 25% less than total movies did by Amir khan in same year. Ratio of movie did by Salman khan and Sharukh khan in 2016 is 2 : 3.

14. Number of movies did by Amir khan in 2015, 2016 & 2017 together is what percent more/less than total number of movies did by all in 2015 ?
(a) $12\frac{2}{4}\%$ (b) $17\frac{7}{9}\%$ (c) $21\frac{2}{3}\%$ (d) $27\frac{2}{5}\%$ (e) None of these

15. What is the difference of average number of movies did by Sharukh khan in 2015 and 2016 and average number of movies did by Salman khan and Amir khan in 2017?
 (a) 310 (b) 330 (c) None of these (d) 300 (e) 290
16. If total number of movies did by all in 2018 is 50% more than total number of movies did by all in 2016, then what is the ratio of total number of movies did by all in 2017 to total number of movies did by all in 2018 ?
 (a) 32 : 17 (b) None of these (c) 21 : 19 (d) 33 : 19 (e) 32 : 21
17. Average number of movies did by Salman khan in 2015, 2016 & 2017 is approximately what percent more/less than average number of movies did by all in 2016?
 (a) 104% (b) None of these (c) 124% (d) 114% (e) 110%
18. Average number of movies did by all in all three years is how much more than average number of movies did by Sharukh khan and Amir khan in 2016?
 (a) None of these (b) 1000 (c) 1200 (d) 1100 (e) 1400

Directions (19–23): Read the given information carefully and answer the following questions.

In Unitech cyber-park, there are two buildings of residential flats – tower A and tower B. The number of flats in tower A is < 100 while that in tower B is ≥ 75 . For each tower, flats are classified into two categories – **2BHK or 3BHK**. A 2BHK flat requires not more than two rooms, while a 3 BHK flat requires three or more rooms. Further a flat could be of X type or Y type (flat located at less than 6th floor).

The number of 3BHK Y type flats in tower B is 10 less than half the number of 2BHK type Y flats in tower A. The ratio of number of 2BHK X type flats in tower A to number of 3BHK type X flats in tower B is 5: 3. The number of type Y 3BHK flats in tower A is 5 less than thrice the number of type X 2BHK flats in tower B. The number of type X flats in tower B is 35 less than the number of 2BHK flats in tower A. The number of type Y flats in tower A is 30 more than the number of 3BHK flats in tower B. The number of 2BHK type Y flats in tower B is thrice the number of type X 3BHK flats in tower A. Number of 3BHK flats of type Y in tower B is at least 5.

19. Find the number of type X 2BHK flats in tower B?
 (a) 16 (b) 9 (c) 6 (d) 15 (e) 14
20. Which of the following options has minimum number of flats?
 (a) 2BHK flats of type X (tower B) (b) 3BHK flats of type Y (tower A) (c) 2BHK flats of type Y (tower B)
 (d) 3BHK flats of type X (tower B) (e) 3BHK flats of type Y (tower B)
21. What could be the possible difference between the number of type Y 2BHK flats in tower A and number of type Y 2BHK flats in tower B?
 (a) 10 (b) 13 (c) Either (a) or (b) (d) 16 (e) Either (a) or (d)
22. What could be the possible number of 3BHK flats?
 (a) 66 (b) 58 (c) 62 (d) 61 (e) 65
23. Find ratio of total number of type X flats in tower B to the total number of type Y flats in tower A?
 (a) 2:3 (b) 2:5 (c) 1:2 (d) 3:8 (e) 3:5

Direction (24–28): Given below statistical data gives the information about the top 5 shoes selling companies in India in three successive years. Read the data carefully and answer the following questions:

Year 2016 – Pairs of shoes sold by Reebok is 55% of the total pairs of shoes sold by Nike. Woodland sold 20% less pair of shoes than Reebok. Ratio of pairs of shoes sold by ADIDAS to pairs of shoes sold by Nike is 3 : 5. Pairs of shoes sold by Puma are 7,722 and average pairs of shoes sold by all 5 companies are 6,310.

Year 2017 – Pairs of shoes sold by all 5 companies is increased by 20% and Pairs of shoes sold by Nike is increased by 20% compared to previous year. Ratio of pairs of shoes sold by ADIDAS to pairs of shoes sold by Puma is 23 : 30 and pairs of shoes sold by Puma is 2,040 less than the pairs of shoes sold by Nike. Pairs of shoes sold by Reebok are 2,236 more than the pairs of shoes sold by Woodland.

Year 2018 – Pairs of shoes sold by Puma is increased by 30% as compared to previous year. Pairs of shoes sold by Woodland are 40% less than the pairs of shoes sold by Puma. Total pairs of shoes sold by Reebok and ADIDAS is 16,900 and ratio of pairs of shoes sold by Nike to pairs of shoes sold by ADIDAS is 3 : 2. Total pairs of shoes sold by Nike and ADIDAS is 3,100 more than total pairs of shoes sold by Reebok and ADIDAS.

24. Find the ratio of pairs of shoes sold by Nike in 2016 to the pairs of shoes sold by ADIDAS in 2018.
 (a) 46:45 (b) 92 :89 (c) 92 : 117 (d) 23 : 20 (e) 2 : 1
25. Find the average number of pairs of shoes sold by Nike, Puma and Woodland in 2018 is what percent of the pairs of shoes sold by ADIDAS in 2018.
 (a) 125% (b) 128% (c) 121% (d) 131% (e) 117%
26. Pairs of shoes sold by ADIDAS and Puma together in 2017 is what percent more or less than the pairs of shoes sold by Reebok in 2018?
 (a) $78\frac{58}{89}\%$ (b) $67\frac{26}{35}\%$ (c) $87\frac{14}{23}\%$ (d) $77\frac{21}{23}\%$ (e) None of the above.
27. Find the difference between the average number of pairs of shoes sold by Puma in 2016, 2017 and 2018 and pairs of shoes sold by Reebok in 2017.
 (a) 2,877 (b) 2,856 (c) 2,821 (d) 2,809 (e) 2,896
28. Find the average number of pairs of shoes sold by all 5 companies in 2018 is how much more than the average number of pairs of shoes sold by all 5 companies in 2017.
 (a) 1,927 (b) 1,952 (c) 1,968 (d) 1,989 (e) 1,903

Direction (29-33): Study the following information carefully and answer the given questions.

A total of 1800 students are studying in 5 live courses (Banking, SSC, Railways, CTET and Defense) of Adda247. The ratio of total male & total female students in these 5 courses is 128:97. 259 males study in Banking while 67 females study in Railways. The ratio of total students studying in Banking to those studying in Railways is 10:3.

Males studying in SSC is $\frac{43}{7}$ times more than the males studying in CTET and males in CTET is 77. A total of 308 females study in Banking & Railways. Students studying in Banking are 150% more than those studying in CTET. Only 100 students are enrolled in Defense.

29. What is the ratio of females studying in SSC to males studying in Defense?
 (a) 8 : 1 (b) 60 : 11 (c) 10 : 1 (d) 20 : 3 (e) 110 : 9
30. What is the average number of students studying in Banking and SSC?
 (a) 660 (b) 665 (c) 675 (d) 680 (e) 690
31. Male students studying in Defense is what percent of males studying in SSC?
 (a) 10% (b) 12% (c) 11% (d) 9% (e) 8%
32. Female students studying in Banking is approximately what percent more or less than that of in SSC?
 (a) 15% (b) 18% (c) 22% (d) 25% (e) 20%
33. How many male students are in CTET & Defense together?
 (a) 168 (b) 122 (c) 200 (d) 132 (e) 178

Direction (34-36): Read the given information carefully and answer the following questions.

Following paragraph shows the information about four students (A, B, C and D) who have attempted English exams. There are two types of questions i.e. Shorts questions and Long questions.

Short questions section: I. Each question is of 5 marks.
 II. Candidates have to attempt at least 6 out of every 7 questions.

Long questions section: I. Each question is of 10 marks.
 II. Candidates have to attempt at least 7 out of every 9 questions

Note – 0.5 marks will be deducted for each spelling error and 0.75 marks will be deducted if he forgot to write a whole word.

In this exam, there are total 42 short and 18 long questions. B corrects 14 long questions and obtained 131 marks whereas he obtained 175 marks in short section. Total marks obtained by A in short questions is 160 by attempting 38 questions. C attempted all the short questions and corrects as twice as number of questions correct in long section and got 150.5 marks in the long questions. D answered correctly 15 long questions and ratio of spelling errors in long to short section is 3:4.

34. If C did spelling mistakes and whole word mistakes in the ratio of 5:3 in the long question section then find marks obtained by him in short section if he did no spelling and whole word mistake?
 (a) 170 (b) 150 (c) 155 (d) 160 (e) 180
35. If A did 25% more spelling mistakes in long question than that of short and corrects 16 long questions and obtained 135 marks in it, then find how many questions are wrong in short section?
 (a) 1 (b) 2 (c) 3 (d) 4 (e) 5
36. B did 43 spelling errors and 18 full word errors in short section while total number of spelling errors done by D is equal to the number of questions answered correctly by B. Find number of marks obtained by D in both section if he corrects 40 short questions?
 (a) 318 (b) 322 (c) 329 (d) 309 (e) 315

Direction (37-39): Read the data carefully and answer the questions.

Five mobile companies Jio, Airtel, Vodafone, Aircel and Idea saw growth rates (integral values) ranging from 10% to 50% in the year 2005. Jio with the least revenues of Rs. 1200 crores in 2005 saw the maximum growth rate of 50% and Aircel with the highest revenue saw the least growth rate of 10% in 2005. Airtel revenues in 2006 was equal to that of revenues of Aircel in 2005, while Vodafone 2006 revenue was equal to that of revenue of Airtel in 2005. Jio revenue in 2006 was equal to that of revenue of Idea in 2005. Anurag an economical analytic observes that one of the companies has twice the growth rate of another. Veer an economic advisor corrects him and says that this is the case in two different instances. Idea has a revenue equal to the average revenue seen in Jio and Aircel in 2005 and have growth rate equal to the average growth rate of Jio and Aircel in 2005. Mr. Neeraj mentioned that, if Vodafone's revenue in 2005 had grown at the rate seen by Jio in 2005, then Vodafone's revenue in 2006 would have been equal to revenues seen by Airtel in 2006

37. What is the overall maximum growth rate seen by all five companies put together?
 (a) 24.4% (b) 28% (c) 27% (d) 21.7% (e) 29.7%
38. Which company has third highest growth rate?
 (a) Airtel (b) Vodafone (c) Aircel (d) Jio (e) Either (a) or (b)
39. In absolute value term, which company added second maximum revenue in 2006 over 2005?
 (a) Airtel (b) Idea (c) Aircel (d) Jio (e) Vodafone

Directions (40-44): Read the given information carefully and answer the following questions.

In a company, there are two manufacturing units – Units A and Units B and each of these manufacturing units produce same type of product. The number of employees (males and females) in Unit A is less than 100 while that in Unit B is not less than 75. Number of products produce by a woman employee is not more than two while in same time a man employee produces not less than 3 products. An employee can be either beginner or experienced.

The number of beginner males in Unit B is 10 less than half the number of beginner female in Unit A. The ratio of experienced female in Unit A to experienced male in Unit B is 5: 3. The number of beginner male in Unit A is 5 less than thrice the experienced female in Unit B. The number of experienced in Unit B is 35 less than the number of females in Unit A. The number of beginners in Unit A is 30 more than the number of males in Unit B. The number of beginner females in Unit B is thrice the number of experienced males in Unit A. Number of beginner males in Unit B is at least 6.]

40. Find the number of experienced female employees in Unit A?
 (a) 45 (b) 40 (c) 30 (d) 20 (e) 25
41. What could be the possible number of beginner employees in the company?
 I. 102 II. 108 III. 99 IV. 101 V. 104
 (a) Only I and III (b) Only I (c) Only II and III (d) Only II and IV (e) Only II and V
42. What could be the possible difference between number of beginner females in Unit A and number of beginner females in Unit B?
 (a) 10 (b) 13 (c) Either (a) or (d) (d) 16 (e) Either (a) or (b)
43. Which of the following options has minimum number of employees?
 (a) Experienced female (Unit B) (b) Beginner male (Unit A) (c) Beginner female (Unit B)
 (d) Experienced male (Unit B) (e) Beginner female (Unit A)
44. Find ratio of total number of beginner employees in Unit A to total number of male employees in Unit B?
 (a) 3: 2 (b) 5: 2 (c) 2: 1 (d) 8: 3 (e) 9: 4

Direction (45 – 47): Data given below about total number of students doing B.TECH from two IIT's and distribution of students under different stream. Read data carefully and answer the questions:

Total number of students doing B.TECH from IIT Mumbai are 20% more than total students doing B.TECH from IIT Delhi. Out of total students doing B.TECH from IIT Mumbai 40% in CS stream, 20% in Mechanical stream and remaining are in Electrical stream. Total students in CS stream in IIT Mumbai are 140% more than Total students in CS stream in IIT Delhi. Total students in Mechanical stream in IIT Delhi are two times of Total students in Mechanical stream in IIT Mumbai. Remaining 240 students are in Electrical stream in IIT Delhi.

45. Total Students in CS stream in IIT Mumbai are what percent less than total students in Mechanical & Electrical stream together in IIT Delhi?
 (a) 35% (b) 40% (c) 75% (d) 50% (e) 55%
46. Find the difference between average number of students in CS streams in both IIT and average number of students in Electrical stream in both the IIT's?
 (a) 48 (b) 30 (c) 36 (d) 40 (e) 45
47. Find average number of students doing B.TECH from IIT Mumbai and from IIT Delhi?
 (a) 815 (b) 855 (c) 825 (d) 845 (e) 805

Directions (48-52): Read the given information carefully and answer the following questions.

In SBI PO Pre mock test (having three sections- Quant, Reasoning and English), 150 students have appeared out of which:-
 100 of them cleared the cutoff of Quant.
 80 of them cleared the cutoff of Reasoning
 60 of them cleared the cutoff of English.

48. Find minimum number of students who have cleared cutoff in all three sections?
 (a) 10 (b) None of these (c) 5 (d) 15 (e) 20
49. Find maximum number of students who have cleared cutoff in only two sections together?
 (a) 100 (b) 120 (c) 90 (d) 80 (e) 110
50. Find maximum number of students who have cleared cutoff in all three sections together?
 (a) 45 (b) 50 (c) 30 (d) None of these (e) 25
51. Find maximum number of students who have cleared cutoff in only one section?
 (a) 105 (b) 110 (c) 100 (d) 120 (e) 95
52. Find minimum number of students who have cleared cutoff in only one section?
 (a) 45 (b) 50 (c) 60 (d) 64 (e) 75

Direction (53-56): Read the data carefully and answer the following questions.

There are four multiplexes in Gurgaon sector 29 i.e. (A, B, C & D) and each multiplex plays movie at two time slots i.e. 3 pm and 5 pm. Total people watching movie at 3 pm in B is $16\frac{2}{3}\%$ more than total number of people watching movie in A at the same time, while total number of people watching movie at 5 pm in A is 132 more than that of total number of people watching movie in B at 3 pm. Total number of people watching movie in C at 3 pm is 300 more than the average number of people watching movie in A & B at 3 pm, while total number of people watching movie in B at 5 pm is 68 more than the total number of people watching movie in A at 5 pm & total number of people watching movie in C at 5 pm is 25% more than total number of people watching movie in B at 5 pm. Average number of people watching movie (in all four multiplexes) at 3 pm and at 5 pm is 4200 and ratio of total number of people at 3 pm in all four multiplex to total number of people at 5 pm in all four multiplex is 3 : 4. Total number of people watching movie in D at both time slots is 2448 and total number of people watching movie in D at 5 pm is 188 more than total number of people watching movie at same time in C.

53. If ratio of number of male to number of female watching movie at 3 pm in A is 5 : 3, then find total number of male watching movie at 3 pm in A is what percent of total number of people watching movie at 5 pm in C?
 (a) $30\frac{8}{13}\%$ (b) $32\frac{8}{13}\%$ (c) $28\frac{8}{13}\%$ (d) $26\frac{8}{13}\%$ (e) $34\frac{8}{13}\%$

54. Find the ratio of total number of people watching movie at 5 pm in B to total number of people watching movie at 3 pm in C?
 (a) 26 : 29 (b) 25 : 27 (c) 26 : 27 (d) 26 : 31 (e) None of these
55. Total number of people watching movie at 5 pm in D is what percent more than total number of people watching movie at 3 pm in C?
 (a) $35\frac{7}{9}\%$ (b) $33\frac{7}{9}\%$ (c) $31\frac{7}{9}\%$ (d) $37\frac{7}{9}\%$ (e) $39\frac{7}{9}\%$
56. Find the average number of people watching movie at 3 pm in B, C & D?
 (a) 960 (b) 840 (c) 640 (d) 720 (e) 1080

Practice MCQs for Mains_(Solutions)

Sol (1-5):

Let units of LUX sold in 2017 be $2x$

So, units of Dove sold in 2017 = $\frac{250}{100} \times 2x = 5x$

Let units of Pears sold in 2017 & units of LUX sold in 2018 be $3y$ & $4y$ respectively.

Total units of Pears sold in all the given 3 years = $550 \times 3 = 1650$

Now, total units sold of all 3 types of soaps in 2017 = $(2x + 5x + 3y)$

$$= 7x + 3y$$

So, total units sold of all 3 types of soaps in 2019

$$= (7x + 3y) \times \frac{100}{57.5}$$

$$= (7x + 3y) \times \frac{40}{23}$$

Now, units of Pears sold in 2018 = $1100 - 4y$

Now, units of Pears sold in 2019 = $\frac{1400}{900} \times 3y$

$$= \frac{14}{3}y$$

ATQ,

$$\left(3y + 1100 - 4y + \frac{14y}{3}\right) = 1650$$

$$y = 150$$

$$\text{Now, } \left(\frac{14y}{3} - 2x\right) = 500$$

$$700 - 2x = 500$$

$$x = 100$$

Now, units of Dove sold in 2018 = $\frac{150}{100} \times 500 = 750$

And, units of LUX sold in 2019

$$= \left((7x + 3y) \times \frac{40}{23}\right) - (700 + 500) = 800$$

Years	LUX	Pears	Dove
2017	200	450	500
2018	600	500	750
2019	800	700	500

Total articles sold in 2017 = 1150

Total articles sold in 2018 = 1850

Total articles sold in 2019 = 2000

1. (a): Required sum = $600 + 750 = 1350$

2. (e): Total units of Pears & Dove sold in 2019 together

$$= 700 + 500 = 1200$$

Units of LUX sold in 2017 & 2018 together

$$= 200 + 600 = 800$$

$$\text{Required } \% = \frac{1200 - 800}{800} \times 100 = 50\%$$

3. (a): Required ratio = $\frac{800}{750} = 16 : 15$

4. (c): Units sold of LUX, Pears and Dove together in

$$2018 = 600 + 500 + 750$$

$$= 1850$$

Units sold of LUX and Pears together in 2019

$$= 800 + 700 = 1500$$

$$\text{Required difference} = 1850 - 1500 = 350$$

5. (a): Units of Dove sold in 2017 & 2019 together

$$= 500 + 500 = 1000$$

Units of Pears and Dove sold in 2018 together

$$= 500 + 750 = 1250$$

$$\text{Required percentage} = \frac{1000}{1250} \times 100 = 80\%$$

Sol (6 - 8):

Number of Samsung mobiles sold by A = $520 \times \frac{4}{13} = 160$

And, number of Honor mobiles sold by B = $(1440 - 520 - 480) \times \frac{5}{11} = 200$

Given, total number of mobiles sold by C = 480

Given, Redmi mobile sold by B is 8 more than total Redmi mobiles sold by C

And, total Redmi mobile sold by C are 30% of total Samsung mobiles sold by A

$$\text{So, total Redmi mobile sold by C} = 160 \times \frac{30}{100} = 48$$

And, total Redmi mobile sold by B = $48 + 8 = 56$

$$\text{Total mobile sold by B} = (1440 - 520 - 480) = 440$$

$$\text{Total number of Honor phones sold by C} = 480 \times \frac{1}{2} = 240$$

$$\text{Total Samsung mobiles sold by C} = 480 - 240 - 48 = 192$$

Given, total number of Redmi mobiles sold by A is 20 more than total Samsung mobile sold by C

$$\text{So, total number of Redmi mobiles sold by A} = 192 + 20 = 212$$

Total Honor mobile sold by A = $520 - 212 - 160 = 148$

SHOPS	REDMI	HONOR	SAMSUNG
A	212	148	160
B	56	200	184
C	48	240	192
TOTAL	316	588	536

6. (b): Total number of Redmi mobiles sold by all three shops = 316

7. (d): Total Honor mobile sold by B & C
 $= 200 + 240 = 440$
 Required percentage = $\frac{440}{160} \times 100 = 275\%$

8. (a): Total Samsung mobile sold by B & C
 $= 184 + 192 = 376$
 Total Honor mobiles sold by A, B & C = 588
 Required ratio = $376 : 588 = 94 : 147$

Sol (9-13):

In 2014:

Let units sold of product - A & D be '2x' & 'x' units respectively,

So, units sold of product - C = $x \times \frac{144}{100} = 1.44x$

$$\text{ATQ, } \frac{x + 1.44x + 2x}{3} = 370$$

$$\Rightarrow 4.44x = 1110$$

$$\Rightarrow x = 250$$

So, units sold of product - A = $2x = 500$ units

Units sold of product - C = $1.44x = 360$ units

Units sold of product - D = $x = 250$ units

Units sold of product - B = $1340 - (500 + 360 + 250) = 230$ units

In 2015:

Units sold of product - B = $230 \times \frac{140}{100} = 322$ units

Let units sold of product - D be 'x units'.

$$\text{So, } \frac{322 + x}{2} = 411$$

$$x = 500 \text{ units}$$

Let units sold of product - C be 'y units'.

$$\text{So, } \frac{500 + y}{2} = 475$$

$$y = 450 \text{ units}$$

and units sold of product - A = $500 - 75 = 425$ units.

Products	2014	2015
A	500	425
B	230	322
C	360	450
D	250	500

9. (b): Required % = $\frac{500 - 425}{500} \times 100 = 15\%$ decrease

10. (a): Required ratio = $\frac{500 + 250}{450 + 500} = \frac{750}{950} = 15 : 19$

11. (e): Required difference
 $= \left(\frac{425 + 322 + 450 + 500}{4} \right) - \left(\frac{500 + 230 + 360 + 250}{4} \right)$
 $= 424.25 - 335 = 89.25$

12. (d): Total revenue generated from product - B in 2014
 $= 230 \times 15 = \text{Rs.} 3450$

Total revenue generated from product - D in 2014
 $= 250 \times 12 = 3000 \text{ Rs.}$

Required % = $\frac{3450}{3000} \times 100 = 115\%$

13. (d): Units sold of product - B and C together in 2014
 $= 230 + 360 = 590 \text{ units}$

So, required % = $\frac{590 - 500}{500} \times 100 = \frac{90}{5}\% = 18\%$

Sol (14-18):

No. of movies did by Salman khan in 2015 = 600

No. of movies did by Amir khan in 2016

$$= \frac{2}{5} \times 600 = 240$$

Total number of movies did by all in 2015 = $6 \times 240 = 1440$

Let number of movies did by Amir khan in 2015 be a .

$$\therefore a + \frac{75}{100}a = (1440 - 600)$$

$$\therefore a = 480$$

\therefore No. of movies did by Amir khan and Sharukh khan in 2015 are 480 & 360 respectively

Total no. of movies did by all in 2016

$$= \frac{350}{100} \times 240 = 840$$

No. of movies did by Salman khan in 2016

$$= \frac{2}{5} \times (840 - 240) = 240$$

\therefore No. of movies did by Sharukh khan in 2016 = 360

Total no. of movies did by all in 2017

$$= 3 \times \frac{4}{3} \times 480 = 1920$$

No. of movies did by Sharukh khan in 2017

$$= 1300 - 360 - 360 = 580$$

No. of movies did by Amir khan in 2017

$$= \frac{580}{5} \times 4 = 464$$

No. of movies did by Salman khan in 2017

$$= 1920 - 580 - 464 = 876$$

Actor years	2015	2016	2017
Salman khan	600	240	876
Amir khan	480	240	464
Sharukh khan	360	360	580
Total	1440	840	1920

14. (b): Required percentage = $\frac{1440 - (480 + 240 + 464)}{1440} \times 100$
 $= 17\frac{7}{9}\%$

$$15. (a): \text{Required difference} = \left(\frac{876+464}{2}\right) - \left(\frac{360+360}{2}\right) \\ = 670 - 360 = 310$$

$$16. (e): \text{Required ratio} = \frac{1920}{840 \times \frac{150}{100}} = 32 : 21$$

$$17. (a): \text{Average number of movies did by Salman khan} \\ = \frac{600+240+876}{3} = \frac{1716}{3} = 572 \\ \text{Average number of movies did by all in 2016.} \\ = \frac{840}{3} = 280 \\ \text{Required percentage} = \frac{572-280}{280} \times 100 \approx 104\%$$

$$18. (d): \text{Required difference} = \left(\frac{1440+840+1920}{3}\right) - \left(\frac{240+360}{2}\right) \\ = 1400 - 300 = 1100$$

Sol (19 – 23):

Let number of X type 2BHK flats in tower A be $5x$ and number of Y type 2BHK flats in tower A be $2z$, Number of X type 3BHK flats in Tower A be k , and number of X type 2BHK flats in tower B be y .

Then,

Number of X type 3BHK flats in tower B = $3x$

Number of Y type 3BHK flats in tower B = $(z - 10)$

Number of Y type 2BHK flats in tower B = $3k$

And number of Y type 3BHK flats in tower A = $(3y - 5)$

For tower A:

X type Y type

2BHK $5x$ $2z$

3BHK k $3y - 5$

For tower B:

X type Y type

2BHK y $3k$

3BHK $3x$ $z - 10$

ATQ,

$$2z + 3y - 5 = (3x + z - 10) + 30$$

$$\Rightarrow 3y + z - 3x = 25 \quad \dots (i)$$

$$y + 3x = (5x + 2z) - 35$$

$$\Rightarrow 2x - y + 2z = 35 \quad \dots (ii)$$

From (i) and (ii)

$$7y - 8x = 15$$

By substitution method, $(x, y) = (6, 9)$ or $(13, 17)$ or $(20, 25)$ etc.

Then, value for $z = 16$ or 13 or 10 etc.

$$\text{Number of Y type 3BHK flats in tower B} = (z - 10) \geq 5$$

$$= z \geq 15 \text{ or } z = 16$$

$$\text{Thus, } (x, y, z) = (6, 9, 16)$$

$$\text{Number of flats in tower A} = 5x + 2z + (3y - 5) + k = 84 + k < 100$$

$$\Rightarrow 1 \leq k \leq 15$$

$$\text{Number of flats in tower B} = y + 3k + 3x + (z - 10) \geq 75$$

$$\Rightarrow 33 + 3k \geq 75$$

$$\Rightarrow k \geq 14$$

Thus, $k = 14$ or 15

$$19. (b): \text{Number of type X 2BHK flats in tower B} = y = 9$$

$$20. (e): \text{Number of 3BHK flats of type Y (tower B)} = z - 10 = 6$$

$$21. (c): \text{Number of type Y 2BHK flats in tower A} = 2z = 32 \\ \text{Number of type Y 2BHK flats in tower B} = 3k = \text{either } 42 \text{ or } 45$$

$$22. (d): \text{Possible number of 3BHK flats:} \\ \text{Total number of 3BHK flats} = 60 \text{ (when } k=14) \\ \text{Or, total number of 3BHK flats} = 61 \text{ (when } k=15)$$

$$23. (c): \text{Total number of type X flats in tower B} = 27 \\ \text{Total number of type Y flats in tower A} = 54 \\ \text{Required ratio} = 1:2$$

Sol. (24-28):**2016:**

Let pairs of shoes sold by Nike are $100x$.

$$\text{So, pairs of shoes sold by Reebok} = 100x \times \frac{55}{100} \\ = 55x$$

$$\text{Pairs of shoes sold by Woodland} = 55x \times \frac{80}{100} \\ = 44x$$

$$\text{Pairs of shoes sold by ADIDAS} = 100x \times \frac{3}{5} = 60x$$

ATQ,

$$\text{Total pairs of shoes sold by all 5 companies} = 6,310 \times 5$$

$$100x + 55x + 44x + 60x + 7722 = 31,550$$

$$259x = 23,828$$

$$x = 92$$

$$\text{Hence, pairs of shoes sold by Nike} = 100x \\ = 9,200$$

$$\text{Pairs of shoes sold by Reebok} = 55x \\ = 5,060$$

$$\text{Pairs of shoes sold by Woodland} = 44x \\ = 4,048$$

$$\text{Pairs of shoes sold by ADIDAS} = 60x = 5,520$$

2017:

$$\text{Total pairs of shoes sold} = 31,550 \times \frac{120}{100} \\ = 37,860$$

$$\text{Pairs of shoes sold by Nike} = 9,200 \times \frac{120}{100} = 11,040$$

$$\text{Pairs of shoes sold by Puma} = 11,040 - 2,040 = 9,000$$

Let pairs of shoes sold by ADIDAS and Puma be ' $23x$ ' and ' $30x$ ' respectively.

$$\text{So, } 30x = 9,000$$

$$x = 300$$

$$\text{Hence, pairs of shoes sold by ADIDAS} = 23x = 6,900$$

$$\text{Total pairs of shoes sold by Reebok and Woodland} \\ = 37,860 - 11,040 - 9,000 - 6,900 = 10,920$$

Let pairs of shoes sold by Reebok and Woodland be ' $y+2236$ ' and ' y ' respectively.

$$\text{So, } y + y + 2236 = 10,920$$

$$2y = 8,684$$

$$y = 4,342$$

$$\text{Hence, pairs of shoes sold by Reebok} = y + 2236 = 6,578$$

2018:

$$\text{Pairs of shoes sold by Puma} = 9,000 \times \frac{130}{100} = 11,700$$

$$\text{Pairs of shoes sold by Woodland} = 11,700 \times \frac{60}{100} = 7,020$$

Let total pairs of shoes sold by Nike and ADIDAS be '3x' and '2x' respectively.

ATQ,

$$5x - 16,900 = 3,100$$

$$x = 4,000$$

$$\text{Hence, pairs of shoes sold by Nike} = 3x = 12,000$$

$$\text{Total pairs of shoes sold by ADIDAS} = 2x = 8,000$$

$$\text{Pairs of shoes sold by Reebok} = 16,900 - 8,000 = 8,900$$

Company	2016	2017	2018
Reebok	5,060	6,578	8,900
Nike	9,200	11,040	12,000
ADIDAS	5,520	6,900	8,000
Puma	7,722	9,000	11,700
Woodland	4,048	4,342	7,020

$$24. (d): \text{Required ratio} = \frac{9200}{8000} = \frac{23}{20} = 23 : 20$$

25. (b): Average number of pairs of shoes sold by Nike, Puma and Woodland in 2018

$$= \frac{12,000 + 11,700 + 7,020}{3} = 10,240$$

$$\text{Required \%} = \frac{10,240}{8,000} \times 100 = 128\%$$

$$26. (a): \text{Required \%} = \frac{(9,000 + 6,900) - 8,900}{8,900} \times 100$$

$$= \frac{7,000}{8,900} \times 100 = \frac{7,000}{89} \% = 78\frac{58}{89} \%$$

$$27. (e): \text{Average number of pairs of shoes sold by puma in 2016, 2017 \& 2018} = \frac{7,722 + 9,000 + 11,700}{3} = 9,474$$

$$\text{Required difference} = 9,474 - 6,578 = 2,896$$

$$28. (b): \text{Required difference}$$

$$= \left(\frac{8,900 + 12,000 + 8,000 + 11,700 + 7,020}{5} \right) - \left(\frac{6,578 + 11,040 + 6,900 + 9,000 + 4,342}{5} \right)$$

$$= \left(\frac{47,620}{5} \right) - \left(\frac{37,860}{5} \right)$$

$$= 9,524 - 7,572 = 1,952$$

Sol (29-33):

$$\text{Total students} = 1800$$

$$\text{No. of males in all courses} = \frac{1800}{225} \times 128 = 1024$$

$$\text{No. of females in all courses} = \frac{1800}{225} \times 97 = 776$$

$$\text{No. of male students in Banking} = 259$$

$$\text{No. of female students in Railways} = 67$$

$$\text{No. of male students in CTET} = 77$$

$$\text{No. of male students in SSC} = \left(\frac{43}{7} + 1 \right) \times \text{No. of males in CTET}$$

$$= \frac{50}{7} \times 77 = 550$$

$$\text{No. of female students in Banking} = 308 - 67 = 241$$

$$\text{No. of total students in Banking} = 259 + 241 = 500$$

$$\text{Total students in Banking} = 250\% \text{ of Total students in CTET}$$

$$\text{Total students in CTET} = \frac{500}{250} \times 100 = 200$$

$$\text{No. of female students in CTET} = 200 - 77 = 123$$

$$\text{Total students in Defense} = 100$$

$$\text{Total students in Railways} = \frac{3}{10} \times \text{Total students in Banking}$$

$$= \frac{3}{10} \times 500 = 150$$

$$\text{No. of males studying in Railways} = 150 - 67 = 83$$

$$\text{Total students in SSC}$$

$$= 1800 - (500 + 150 + 200 + 100) = 850$$

$$\text{No. of female students in SSC} = 850 - 550 = 300$$

$$\text{No. of male students in Defense} = 1024 - (259 + 550 + 83 + 77) = 55$$

$$\text{No. of female students in Defense} = 100 - 55 = 45$$

	Banking	SSC	Railways	CTET	Defense
Total Students	500	850	150	200	100
Male Students (1024)	259	550	83	77	55
Female Students (776)	241	300	67	123	45

$$29. (b): \text{required ratio} = \frac{300}{55} = 60 : 11$$

$$30. (c): \text{Required average} = \frac{500 + 850}{2} = \frac{1350}{2} = 675$$

$$31. (a): \text{Required percentage} = \frac{55}{550} \times 100 = 10\%$$

$$32. (e): \text{Required percent}$$

$$= \frac{(300 - 241)}{300} \times 100 = \frac{59}{3} \% = 19.67\% \approx 20\%$$

$$33. (d): \text{Required value} = 77 + 55 = 132$$

34. (d): Let the number of spelling mistakes and whole word mistakes be 5x and 3x respectively in long questions.

Let number of correct questions in long section be y

ATQ

$$\text{Total marks obtained in long section} = 10y - (5x \times 0.5 + 3x \times 0.75) = 150.5$$

$$\text{For } x=2, y \text{ will have integral value i.e. } y=16 \text{ and } y < 18$$

$$\text{So, number of questions corrected by him in short section} = 32$$

$$\text{Total marks obtained by him in short section} = 32 \times 5 = 160$$

35. (b): Let number of spelling errors made by A in short question be $4x$

Then number of spelling errors in long section = $5x$
ATQ

$$16 \times 10 - 5x \times 0.5 = 135$$

$$x = 10$$

Let number of questions corrected in short section be 'a'

ATQ

$$a \times 5 - 40 \times 0.5 = 160$$

$$a = 36$$

And as he attempted 38 short questions

Number of questions did wrong by him in short section = 2

36. (b): Number of questions answered correctly by B in short section = $\frac{175 + 43 \times 0.5 + 18 \times 0.75}{5} = 42$

Total questions answered correctly by B = $42 + 14 = 56$

Spelling errors done by D = 56

Spelling errors done by D in short sections = 32

And spelling errors done by D in long sections = 24

Total marks obtained by D = $(15 \times 10 - 24 \times 0.5) + (40 \times 5 - 32 \times 0.5) = 322$

Sol. (37-39):

Given Jio has revenues of Rs. 1200 crores in 2005 and sees a growth at the rate of 50%

Let revenues of Airtel in 2005 = R

So, the revenues of Airtel in 2006 should be also R

And, let revenues of Airtel in 2005 be Q

And, revenues of Vodafone in 2006 should be also Q

Companies	Revenues in 2005 (Cr.)	Growth rate	Revenue in 2006 (Cr.)
Jio	1200	50%	1800
Airtel	Q		R
Vodafone			Q
Airtel	R	10%	
Idea			

Given Jio revenues in 2006 equal to Idea revenues in 2005
Also given, Idea has a revenue equal to the average revenue seen in Jio and Airtel in 2005, and growth rate equal to the average growth rate of Jio and Airtel in 2005. So, Idea should have seen a growth rate of 30%. Revenue of Airtel should be Rs. 2400 crores in 2005

Companies	Revenues in 2005 (Cr.)	Growth rate	Revenue in 2006 (Cr.)
Jio	1200	50%	1800
Airtel	Q		2400
Vodafone			Q
Airtel	2400	10%	2640
Idea	1800	30%	2340

Given, Vodafone revenue in 2005 had grown at 50% so it would have reached a revenue of R in 2006.

So, Revenues of Vodafone in 2005 = $R \times \frac{2}{3} = 2400 \times \frac{2}{3} = 1600$ cr.

Companies	Revenues in 2005 (Cr.)	Growth rate	Revenue in 2006 (Cr.)
Jio	1200	50%	1800
Airtel	Q		2400
Vodafone	1600		Q
Airtel	2400	10%	2640
Idea	1800	30%	2340

Given, the growth rates seen in Airtel and Vodafone should be from either 2 times of growth rates of Jio, Airtel or Idea or half of growth rates seen in Jio, Airtel or Idea. But since the growth rates should be between 10% and 50%, the only possibilities we have are 15%, 20% and 25%, but after looking the table it not possible to put growth 15% rate of any two remaining company because 2400 cr. is not multiple of 115%.

From the numbers, we can see that Vodafone should have grown by 25% and Airtel by 20% or growth rate Vodafone as 20% and Airtel at 25%, it is just an assumption.

Companies	Revenues in 2005 (Cr.)	Growth rate	Revenue in 2006 (Cr.)
Jio	1200	50%	1800
Airtel	2000	20%	2400
Vodafone	1600	25%	2000
Airtel	2400	10%	2640
Idea	1800	30%	2340

Or,

Companies	Revenues in 2005 (Cr.)	Growth rate	Revenue in 2006 (Cr.)
Jio	1200	50%	1800
Airtel	1920	25%	2400
Vodafone	1600	20%	1920
Airtel	2400	10%	2640
Idea	1800	30%	2340

37. (a): Required maximum growth

$$= \frac{\text{total revenue of all five companies in 2006} - \text{total revenue of all five companies in 2005}}{\text{total revenue of all five companies in 2005}} \times 100 = \frac{11100 - 8920}{8920} \times 100 = 24.4\%$$

38. (e): From the table we can see that Vodafone should have grown by 25% and Airtel by 20% or growth rate Vodafone as 20% and Airtel at 25%,
So, third highest growth rate can be either of Vodafone or Airtel.

39. (b): From the table, Idea added second maximum revenue in 2006 over 2005

Sol (40 – 44):

Let number of experienced females in Unit A be $5x$ and number of experienced males in Unit B = $3x$

Let number of beginner females in Unit A be $2z$ then number of beginner males in Unit B = $(z-10)$

Let number of experienced males in Unit A be k then number of beginner females in Unit B = $3k$

And let number of experienced females in Unit B be y then number of beginner male in Unit A = $(3y - 5)$

For Unit A:

Experienced Beginner

Female $5x$ $2z$

Male $3y - 5$

For Unit B:

Experienced Beginner

Female y $3k$

Male $3x$ $z-10$

ATQ,

$$2z + 3y - 5 = (3x + z - 10) + 30$$

$$\Rightarrow 3y + z - 3x = 25 \quad \dots (i)$$

$$y + 3x = (5x + 2z) - 35$$

$$\Rightarrow 2x - y + 2z = 35 \quad \dots (ii)$$

From (i) and (ii)

$$7y - 8x = 15$$

By substitution method, $(x, y) = (6, 9)$ or $(13, 17)$ or $(20, 25)$ etc.

Then, value for $z = 16$ or 13 or 10 etc.

Number of beginner males in Unit B = $(z - 10) \geq 6$

$$= z \geq 16$$

Thus, $(x, y, z) = (6, 9, 16)$

Number of employees in Unit A = $5x + 2z + (3y - 5) + k = 84 + k < 100$

$$\Rightarrow 1 \leq k \leq 15$$

Number of employees in Unit B = $y + 3k + 3x + (z - 10) \geq 75$

$$\Rightarrow 33 + 3k \geq 75$$

$$\Rightarrow k \geq 14$$

Thus, $k = 14$ or 15

40. (c): Number of experienced female employees in Unit A = $5x = 30$

41. (b): Total number of beginner employees in the company = 102 (when $k=14$)

Or, total number of beginner employees in the company = 105 (when $k=15$)

42. (e): Number of beginner females in Unit A = $2z = 32$
Number of beginner females in Unit B = $3k =$ either 42 or 45

43. (a): Number of Experienced female (Unit B) = 9

44. (e): Total number of beginner employees in Unit A = 54
Total number of male employees in Unit B = 24

$$\text{Required ratio} = \frac{54}{24} = 9:4$$

Sol (45-47):

Let total students doing B. tech in IIT Delhi be $100x$ and total students doing B. tech in IIT Mumbai be $120x$

Total students in CS stream in IIT Mumbai

$$= 120x \times \frac{40}{100} = 48x$$

Total students in Mechanical stream in IIT Mumbai

$$= 120x \times \frac{20}{100} = 24x$$

Total students in Electrical stream in IIT Mumbai

$$= 120x - (48x + 24) = 48x$$

Total students in CS stream in IIT Delhi

$$= 48x \times \frac{100}{240} = 20x$$

Total students in Mechanical stream in IIT Delhi

$$= 24x \times 2$$

$$= 48x$$

Total students in Electrical stream in Delhi IIT

$$= 100x - (20x + 48x)$$

$$= 32x$$

$$\text{Given } 32x = 240$$

$$x = 7.5$$

Total students doing B. TECH in IIT Delhi

$$= 7.5 \times 100 = 750$$

Total students doing B. tech in IIT Mumbai

$$= 7.5 \times 120 = 900$$

IIT Delhi		IIT Mumbai	
Stream	Students	Stream	Students
CS	150	CS	360
Mechanical	360	Mechanical	180
Electrical	240	Electrical	360

$$\begin{aligned} \text{45. (b): Required percentage} &= \frac{600-360}{600} \times 100 \\ &= \frac{240}{600} \times 100 = 40\% \end{aligned}$$

46. (e): Average number of students in CS stream in both IIT's

$$= \frac{150+360}{2} = 255$$

Average number of students in Electrical stream in both IIT's

$$= \frac{240+360}{2} = 300$$

$$\text{Required difference} = 300 - 255 = 45$$

$$\text{47. (c): Required average} = \frac{750+900}{2} = \frac{1650}{2} = 825$$

Sol. (48 – 52):

Let x = sum of students who have passed in only one section.

y = sum of students who have passed only in two sections together.

z = all the students who have passed in all the three sections together.

We have,

$$x + y + z = 150 \dots (i)$$

and

	x	y	z
Maximum	≤ 150	≤ 150	≤ 60
Minimum	≥ 0	≥ 0	≥ 0

$$x + 2y + 3z = 240 \dots (ii)$$

When we subtract (i) from (ii)

$$y + 2z = 90 \dots (iv)$$

When we subtract (ii) from $2 \times (i)$

$$x - z = 60 \dots (v)$$

When we subtract (ii) from $3 \times (i)$

$$2x + y = 210 \dots (vi)$$

From (iv)

$$y + 2z = 90$$

	x	y	z
Maximum		90	45
Minimum		0	0
Maximum			
Minimum	60		0
Maximum	105		
Minimum		0	

if $y = 0$ then $z = 45$

if $z = 0$ then $y = 90$

From (v)

$$x - z = 60$$

if $z = 0$ then $x = 60$ (minimum)

From (vi)

$$2x + y = 210.$$

if $y = 0$ then $x = 105$

if $x = 60$ then $y = 90$

48. (b): Required number of students = 0

49. (c): Required number of students = 90

50. (a): Required number of students = 45

51. (a): Required number of students = 105

52. (c): Required number of students = 60

Solution (53 - 56)

Let total number of people watching movie at 3 pm in A = a

So, total number of people watching movie at 3 pm in B = $\frac{7a}{6}$

Total number of people watching movie at 5 pm in A = $\frac{7a}{6} + 132 = \frac{(7a+792)}{6}$

Total number of people watching movie at 3 pm in C = $\frac{a+\frac{7a}{6}}{2} + 300 = \frac{(13a+3600)}{12}$

Total number of people watching movie at 5 pm in B

$$= \left(\frac{7a+792}{6} \right) + 68 = \frac{(7a+1200)}{6}$$

Total number of people watching movie at 5 pm in C

$$= \frac{(7a+1200)}{6} \times \frac{5}{4} = \frac{(35a+6000)}{24}$$

Total number of people watching movie at 3 pm in all the four multiplexes = $4200 \times 2 \times \frac{3}{7} = 3600$

Total number of people watching movie at 5 pm in all the four multiplexes = $4200 \times 2 \times \frac{4}{7} = 4800$

Given,

$$\left[a + \frac{7a}{6} + \frac{13a+3600}{12} + \frac{7a+792}{6} + \frac{7a+1200}{6} + \frac{35a+6000}{24} \right] = 8400 - 2448$$

$$\frac{24a+28a+26a+7200+28a+3168+28a+4800+35a+6000}{24} = 5952$$

$$169a + 21168 = 142848$$

$$169a = 121680$$

$$a = 720$$

Total number of people watching movie at 5 pm in D

$$= \frac{35 \times 720 + 6000}{24} + 188 = 1488$$

Total number of people watching movie in D at 3 pm = $2448 - 1488 = 960$

Multiplexes	3 pm	5 pm
A	$a = 720$	$\frac{7 \times 720}{6} + 132 = 972$
B	$\frac{7 \times 720}{6} = 840$	$972 + 68 = 1040$
C	$\left(\frac{720 + 840}{2} \right) + 300 = 1080$	$1040 \times 1.25 = 1300$
D	960	1488

53. (e): Total number of male watching movie at 3 pm in A

$$= 720 \times \frac{5}{8} = 450$$

$$\text{Required percentage} = \frac{450}{1300} \times 100 = 34 \frac{8}{13} \%$$

54. (c): Required ratio = $\frac{1040}{1080} = 26 : 27$

55. (d): Required percentage = $\frac{1488-1080}{1080} \times 100$

$$= \frac{408}{1080} \times 100 = 37 \frac{7}{9} \%$$

56. (a): Required average = $\frac{840+1080+960}{3}$

$$= \frac{2880}{3} = 960$$

Previous Years' Questions of Prelims

Directions (1-5): Study the paragraph and answer the questions based on it.

In 2017 there are total 840 people (**male + female**) in a village. There are two type of people who eats veg and another who eats non-veg. 120 male eats veg which is 30% of total male (**veg + non-veg**) population. Difference between no. of male and female who eats non-veg is 180.

No one eats both (**veg + non-veg**).

1. No. of male who eats veg are how much percent more/less than no. of female who eats non-veg?
(a) 20% (b) 25% (c) 15% (d) 10% (e) None of these.
2. What is the average of no. of male who eats non-veg and no. of female who eats veg?
(a) 260 (b) 245 (c) 310 (d) 210 (e) 225
3. What is the difference between no. of people who eats veg(male+female) and non-veg (male + female)?
(a) 100 (b) 90 (c) 60 (d) 80 (e) 120
4. If in 2018 no. of female who eats non-veg reduces by 20%, find no. female who eats veg in 2018 (consider total no. of female remained constant)?
(a) 360 (b) 340 (c) 350 (d) 370 (e) None of these.
5. What is ratio between total no. of people who eats non-veg to total no. of female who eats veg?
(a) 17:9 (b) 17:19 (c) 9:17 (d) 19:17 (e) 11:13

Directions (6-10): There are two villages A and B whose population are 800 and 1200 respectively. 30% of total population of village A are farmers and 60% of total population of village B are farmers. Ratio of male to female farmers in village A and B is 2 : 3 and 7 : 5 respectively.

6. Total number of female farmers from both villages is what percent more or less than total population of village B.
(a) 65% (b) 63% (c) 66% (d) 69% (e) 60%
7. What is the ratio of male farmers from village A to female farmers from village B?
(a) 8 : 25 (b) 9 : 26 (c) 7 : 24 (d) 10 : 29 (e) 11 : 30
8. Total male farmers from both villages are how much more or less than total population of village A
(a) 288 (b) 290 (c) 294 (d) 280 (e) 284
9. Male farmers in village A are what percent of female farmers in village B.
(a) 35% (b) 33% (c) 30% (d) 32% (e) 34%
10. What is the average of farmers from village A and village B.
(a) 380 (b) 420 (c) 480 (d) 360 (e) 440

Direction (11 – 15): Read the data carefully and answer the question.

MR. 'A' type Different number of Words Per Day. The number of words typed by Mr. 'A' on Monday is 40% of the total words typed in four days. Also number of words typed by him on three different days: Tuesday, Wednesday, and Thursday are in the ratio 2:3:1. The no. of words typed by Mr. 'A' on Thursday is 300.

11. If ratio between total number of words type by Mr. 'A' & Mr. 'B' on Wednesday is 3 : 4, then find total words type by Mr. 'B' on Wednesday?
(a) 1000 (b) 800 (c) 600 (d) 1200 (e) 1800
12. If total words typed by Mr. 'C' is 500% more than total words type by Mr. 'A' on Tuesday, then find total words typed by Mr. 'C' is what percent more than total words type by Mr. 'A' ?
(a) 15% (b) 20% (c) 10% (d) 5% (e) 12%
13. Find ratio between total words type by Mr. 'A' on Monday to total words typed by Mr. 'R' on same day, if total words typed by Mr. 'R' on Monday is $33\frac{1}{3}\%$ more than total words type by Mr. 'A' on Wednesday?
(a) 1: 1 (b) 1 : 2 (c) 1: 3 (d) 1: 5 (e) 1: 4

14. Find difference between total words type by Mr. 'A' on Monday & Thursday ?
 (a) 600 (b) 200 (c) 900 (d) 700 (e) 1200
15. Find average number of words type by Mr. 'A' on Monday, Wednesday & Thursday
 (a) 600 (b) 400 (c) 200 (d) 800 (e) 500

Direction (16-20): - In an institute there are total 454 students take admission to learn Spanish and French language. Only one student learn one language.

Male who learns Spanish language is 70% of Female who learn Spanish language.

Female who learns French language is 10 more than Male who learn French language.

Female who learns Spanish language is same as Male who learn French language.

16. Find total number of male students who take admission for learn Spanish language?
 (a) 100 (b) 70 (c) 84 (d) 120 (e) 130
17. Total number of Female who learn French language is what percent of the total female who learn Spanish language & French together?
 (a) 44% (b) 54% (c) 46% (d) 48% (e) 52%
18. Find the ratio between numbers of male students who learn French to number of male who learn Spanish language?
 (a) 10 : 7 (b) 7 : 10 (c) 12 : 13 (d) 13 : 12 (e) 42 : 65
19. Total number of students who learn French language is how much more than total number of students who learn Spanish language?
 (a) 46 (b) 40 (c) 44 (d) 50 (e) 48
20. Find the average number of male students who learn French language and Spanish language together?
 (a) 110 (b) 116 (c) 125 (d) 102 (e) 107

Direction (21 - 25): Read the data carefully and answer the questions.

As sum of Rs. 90,000 is to be distributed among 5 person i.e. A, B, C, D and E respectively. Ratio of share of A to share of D is 6 : 5. Difference in share of D and share of C is $11\frac{1}{9}\%$ of total sum of all. Share of D is Rs. 3000 more than share of E. Share of B is $11\frac{1}{9}\%$ more than share of A. Share of C is more than share of D.

21. What is the ratio of share of A to share of E.
 (a) 7 : 6 (b) 2 : 1 (c) 3 : 2 (d) 4 : 3 (e) 5 : 4
22. If A invested its share at SI at the rate of 15% p.a. for two years and D invested its share on CI at the rate of 12% p.a. for same period then find the difference in interest obtained by both.
 (a) 1860 (b) 1690 (c) 1754 (d) 1680 (e) 1584
23. Share of C is what percent more or less than share of A.
 (a) $38\frac{8}{9}\%$ (b) $36\frac{7}{9}\%$ (c) $37\frac{8}{9}\%$ (d) $38\frac{7}{9}\%$ (e) $39\frac{2}{9}\%$
24. What is the ratio of sum of share of A and D together to sum of share of B and E together?
 (a) 33 : 29 (b) 33 : 32 (c) 31 : 30 (d) 33 : 31 (e) 31 : 29
25. D and E enter into a business in which D invests its share for a year while E invests its share for x months. If D's share of profit is Rs. 30000 out of total profit of 46000 then find the value of x .
 (a) 10 months (b) 9 months (c) 8 months (d) 7 months (e) 6 months

Directions (26-30): Study the given information carefully and answer the question that follow.

3 pizza shops A, B and C sells veg pizza and non veg pizza. Respective ratio between number of vegetarian and non-vegetarian pizzas sold by pizza shop A was 9 : 7 and that sold by pizza shop B was 3 : 4. The no. of pizzas (Veg + non veg) sold by pizza shop C was 108 and respective ratio between number of vegetarian and non-vegetarian pizza sold by pizza shop C was 7 : 5 Total number of pizza sold by all three pizza shop was 376. Number of veg pizza sold by pizza shop A was 20% more than the veg pizza sold by pizza shop B.

26. If cost of each veg pizza and each non-veg pizza sold by shop B is Rs 200 and Rs 300 respectively then find the total amount obtained by shop B (in Rs).
 (a) 40,000 (b) 36000 (c) 48000 (d) 32000 (e) 44000
27. What is the ratio of veg pizza sold by shop A & C together to the non-veg pizza sold by shop B & C together.
 (a) 27 : 25 (b) 27 : 29 (c) 29 : 27 (d) 25 : 27 (e) 23 : 25
28. What is the average of veg pizza sold by all shops?
 (a) 61 (b) 68 (c) 62 (d) 60 (e) 65
29. Total veg pizzas sold by Shop A and C are what percent of total non-veg pizza sold by shop B & C?
 (a) 113% (b) 108% (c) 109% (d) 112% (e) 116%
30. If Veg pizza sold by shop B is increased by $33\frac{1}{3}\%$ and non-veg pizza sold by shop A is increased by 75% then what is the sum of veg pizza sold by B and non-veg pizza sold by A after increment.
 (a) 178 (b) 186 (c) 198 (d) 200 (e) 182

Direction (31–35): Read the data carefully and answer the question.

There are 1800 students in two school 'A' & 'B' and three streams in each school i.e. art, science & commerce. $18\frac{3}{4}\%$ of total students in school A are in commerce stream and $28\frac{4}{7}\%$ of total students in school B are in science stream. Sum of total students in commerce stream in A & science stream in B is 420. $19\frac{1}{21}\%$ of total students in school B are in commerce stream and 50% of total students in school A are in Art stream.

31. Total students in art stream in A is what percent more than total students in science stream in B?
 (a) 75% (b) 70% (c) 90% (d) 100% (e) 110%
32. Find the ratio of total students in commerce stream in B to total students in science stream in A?
 (a) 8 : 15 (b) 8 : 17 (c) 8 : 13 (d) 8 : 11 (e) 8 : 9
33. If in school C total students are 720 students and total students in science stream of school C are 25% more than total students in commerce stream in school B, then find total students of art & commerce stream in school C is how much less than total students in art and commerce stream in school A?
 (a) 120 (b) 110 (c) 150 (d) 100 (e) 140
34. Find the average number of students in science stream in school A & B?
 (a) 250 (b) 270 (c) 240 (d) 200 (e) 225
35. If out of total students in art stream of school A & B ratio of boys to girl is 5 : 3 and 7 : 4 respectively, then find difference between boys and girls in art stream of school A & B together?
 (a) 220 (b) 225 (c) 240 (d) 248 (e) 224

Directions (36-40):- Read the given information carefully and answer the following questions.

There are four hostels i.e. A, B, C and D.

In hostel A: Number of boys are 120 and number of girls are 30% more than that of number of girls in hostel B.

In hostel B: Number of boys are double than that of number of girls.

In hostel C: Number of boys are 100 more than that of boys in hostel A and total boys and girls in C is 1000.

In hostel D: Number of boys is 182 more than the number of boys in hostel A. Average of number of girls of hostel A and that of hostel D is 223. Number of boys in hostel D is 98 less than that of boys in hostel B.

36. Difference between number of boys and girls in hostel D is what percent of difference between boys and girls in hostel B?
 (a) 53% (b) 58% (c) 63% (d) 60% (e) 57.5%
37. Find difference between total number of boys and girls together in hostel A and that in hostel D?
 (a) 108 (b) 118 (c) 112 (d) 98 (e) 128
38. Find ratio of total number of boys and girls together in hostel B to that of in hostel C?
 (a) 3 : 5 (b) 2 : 5 (c) 3 : 4 (d) 4 : 5 (e) 6 : 5

39. If 20 boys from each hostel left their hostel then find the average of remaining number of boys in all the hostels?
 (a) 239.5 (b) 235 (c) 250.5 (d) 240.5 (e) 245.5
40. Total number of boys in hostel A and that of girls in hostel C is what percent more than number of boys in hostel B?
 (a) 100% (b) 125% (c) 150% (d) 137.5% (e) 175%

Directions (41-45): There are 450 coupons which can be used in Pedicure and Hair cutting. Ratio between Males to Females who use their coupons in Hair cutting is 13 : 7 Number of males who use their coupons in Pedicure is 72 more than number of females who use their coupon in Hair cutting. Total number of males who use their coupon in Pedicure and Haircutting together is 174 more than total number of females who use their coupon in Pedicure and Haircutting together.

41. Males who use their coupon in Pedicure is what percent of the Males who use their coupons in Haircutting?
 (a) 200% (b) 100% (c) None of the given options
 (d) 0% (e) 150%
42. Find the ratio between Total number persons who use their coupons in Pedicure to total number of persons who use their coupons in Haircutting?
 (a) 52 : 23 (b) None of the given options (c) 8 : 9
 (d) 8 : 7 (e) 7 : 8
43. Females who use their coupon in Haircutting is how much more than Females who use their coupon in Pedicure?
 (a) 15 (b) 45 (c) 30 (d) None of the given options (e) 60
44. Out of males who use their coupons in Haircutting, 25% belongs to city A, then find number of males who use their coupons in Haircutting which doesn't belongs to city A?
 (a) None of the give options (b) 108 (c) 126 (d) 117 (e) 135
45. Ratio between Males who use their coupon in Pedicure to that of in Spa is 4 : 5, while ratio between Females who use their coupon in Haircutting to that of in Spa is 6 : 11. Find total number of people who use their coupons in Spa?
 (a) 349 (b) 481 (c) 300
 (d) 440 (e) None of the given options

Previous Years' Solutions of Prelims

Sol (1-5)

Total no. of male who eats veg = 120
 Total no. of male (veg + non-veg) = $\frac{120}{30} \times 100 = 400$
 No. of male who eats non-veg = $400 - 120 = 280$
 Total no. of female = $840 - 400 = 440$
 Total no. of female who eats non-veg = $280 - 180 = 100$
 No. of female who eats veg = $440 - 100 = 340$

- (a): required percentage = $\frac{120-100}{100} \times 100 = 20\%$
- (c): required average = $\frac{280+340}{2} = 310$
- (d): required difference = $120 + 340 - 280 - 100 = 80$
- (a): required no. of female in 2018 who eats veg = $340 + 100 \times \frac{20}{100} = 360$
- (d): required ratio = $(280 + 100) : 340 = 380 : 340 = 19 : 17$

Solutions (6-10):

Total farmers in village A = $800 \times \frac{30}{100} = 240$
 Male and female farmers in village A are 96 and 144 respectively
 Total farmers in village B = $1200 \times \frac{60}{100} = 720$
 Male and female farmers in village B are 420 and 300 respectively

- (b): Required % = $\frac{1200 - (144 + 300)}{1200} \times 100 = \frac{1200 - 444}{12} \% = \frac{756}{12} \% = 63\%$
- (a): Required ratio = $\frac{96}{300} = 8 : 25$
- (e): Required number = $800 - (420 + 96) = 800 - 516 = 284$
- (d): Required percentage = $\frac{96}{300} \times 100 = 32\%$
- (c): Required average = $\frac{240 + 720}{2} = 120 + 360 = 480$

Sol. (11 – 15):

Let total words type by Mr. 'A' in all four days = $100x$

So, number of words type by Mr. 'A' on Monday = $100x \times \frac{40}{100} = 40x$

Total words type by Mr. 'A' on Tuesday = $(100x - 40x) \times \frac{2}{6} = 20x$

Total words type by Mr. 'A' on Wednesday = $(100x - 40x) \times \frac{3}{6} = 30x$

Total words type by Mr. 'A' on Thursday = $(100x - 40x) \times \frac{1}{6} = 10x$

Given, $10x = 300$

$x = 30$

Total number of words type by Mr. 'A' on Monday = $30 \times 40 = 1200$

Total words type by Mr. 'A' on Tuesday = $30 \times 20 = 600$

Total words type by Mr. 'A' on Wednesday = $30 \times 30 = 900$

Total words type by Mr. 'A' on Thursday = $30 \times 10 = 300$

11. (d): Total words type by Mr. 'B' on Wednesday = $900 \times \frac{4}{3} = 1200$

12. (b): Total words types by Mr. 'C' = $600 \times \frac{600}{100} = 3600$
 Required percentage = $\frac{3600-3000}{3000} \times 100 = 20\%$

13. (a): Total words typed by Mr. 'R' on Monday = $900 \times \frac{4}{3} = 1200$
 Required ratio = $\frac{1200}{1200} = 1:1$

14. (c): Required difference = $1200 - 300 = 900$

15. (d): Required average = $\frac{1200+900+300}{3} = \frac{2400}{3} = 800$

Solution (16-20)

Total students = 454

Let, Female who learn Spanish language which is same as Male who learn French language = $100x$

Male who learns Spanish language = $\frac{70}{100} \times 100x = 70x$

Female who learns French language = $100x + 10$

ATQ,

$70x + 100x + 100x + 100x + 10 = 454$

$\Rightarrow 370x = 444$

$\Rightarrow x = 1.2$

Spanish		French	
Male	Female	Male	Female
84	120	120	130

16. (c): Total number of male students who learn Spanish Language = 84

17. (e): Required % = $\frac{130}{120+130} \times 100 = \frac{130}{250} \times 100 = 52\%$

18. (a): Required ratio = $\frac{120}{84} = \frac{10}{7}$

19. (a): Required difference = $120 + 130 - 120 - 84 = 130 - 84 = 46$

20. (d): Required average = $\frac{120+84}{2} = \frac{204}{2} = 102$

Sol. (21-25)

Let share of A and D be $6x$ and $5x$ respectively
 And

$C - D = \frac{1}{9} \times 90000$

$C - 5x = 10000$

$C = 10,000 + 5x$

and

$D = E + 3000$

$5x = E + 3000$

$E = 5x - 3000$

Share of B = $\frac{10}{9} \times 6x = \frac{20}{3}x$

So,

$90000 = 6x + \frac{20}{3}x + 5x + 10,000 + 5x + 5x - 3000$

$90000 = 21x + \frac{20}{3}x + 7000$

$90000 = \frac{83x}{3} + 7000$

$\frac{83}{3}x = 83000$

$x = 3000$

Share of A = 18000

Share of B = 20000

Share of C = 25000

Share of E = 12000

21. (c): Required ratio = $18000 : 12000 = 3 : 2$

22. (e): S.I. obtained by A = $\frac{18000 \times 15 \times 2}{100} = 5400$

C.I. obtained by D = $15000 \left(1 + \frac{12}{100}\right)^2 - 15000$

$= 15000 \left[\left(\frac{784}{625} - 1\right)\right]$

$= 15000 \times \frac{159}{625}$

$= 600 \times \frac{159}{25} = 24 \times 159 = 3816$

Required difference = $5400 - 3816 = 1584$

23. (a): Required percentage = $\frac{25000-18000}{18000} \times 100$

$= \frac{7000}{18000} \times 100$

$= \frac{700}{18} \% = \frac{350}{9} \% = 38\frac{8}{9} \%$

24. (b): Required ratio = $\frac{18000+15000}{20000+12000} = 33 : 32$

25. (c): Ratio of share of profit of D and E

$= 15000 \times 12 : 12000 \times x = 15 : x$

$\frac{15}{15+x} = \frac{30000}{46000}$

$46000 = 30000 + 2000x$

$x = 8$

Sol. (26 – 30):

	A	B	C
Veg	72	60	63
Non-Veg	56	80	45

26. (b): Required total amount
 $= 60 \times 200 + 80 \times 300 = 12000 + 24000 = 36000$

27. (a): Required ratio $= \frac{72+63}{80+45} = \frac{135}{125} = \frac{27}{25}$

28. (e): Required ratio $= \frac{72+60+63}{3} = 65$

29. (b): Required percentage $= \frac{135}{125} \times 100$
 $= \frac{27}{25} \times 100 = 108\%$

30. (a): Required sum $= \frac{4}{3} \times 60 + \frac{7}{4} \times 56$
 $= 80 + 98 = 178$

Sol. (31–35):

Let total students in A = x

And, total students in B = y

Total students in school A in commerce stream $= x \times \frac{75}{4} \times$

$$\frac{1}{100} = \frac{3x}{16}$$

Total students in school B in science stream $= y \times \frac{200}{7} \times$

$$\frac{1}{100} = \frac{2y}{7}$$

$$\text{Given, } \frac{3x}{16} + \frac{2y}{7} = 420 \text{ ----- (i)}$$

$$\text{And } x + y = 1800 \text{ ----- (ii)}$$

So, from (i) and (ii),

Total students in school A = 960

And total students in school B = 840

Total students in school B in commerce stream

$$= \frac{400}{21} \times \frac{1}{100} \times 840 = 160$$

Total students in school A in art stream $= \frac{1}{2} \times 960 = 480$

Now, total students in school A in science stream =

$$960 - \frac{3}{16} \times 960 - 480 = 300$$

And total students in school B in art stream = $840 -$

$$\frac{2}{7} \times 840 - 160 = 440$$

Streams	A	B
Art	480	440
Commerce	180	160
Science	300	240

31. (d): Required percentage $= \frac{480-240}{240} \times 100 = 100\%$

32. (a): Required ratio $= \frac{160}{300} = 8 : 15$

33. (e): Total student art & commerce stream in C = 720
 $- 160 \times \frac{125}{100} = 520$
 Required difference $= (480 + 180) - 520 = 140$

34. (b): Required average $= \frac{300+240}{2} = \frac{540}{2} = 270$

35. (c): Total boys in art stream of school A & B together
 $= 480 \times \frac{5}{8} + 440 \times \frac{7}{11} = 300 + 280 = 580$
 Total girls in art stream of school A & B together =
 $480 \times \frac{3}{8} + 440 \times \frac{4}{11} = 180 + 160 = 340$
 Required difference $= 580 - 340 = 240$

Sol. (36-40):-

Let number of girls in hostel B = 100x

Then number of boys in hostel B = 200x

Number of girls in hostel A = 130x

Number of boys in hostel C = 120 + 100 = 220

Number of girls in hostel C = 1000 - 220 = 780

Total number of girls in hostel A and that of in hostel D = 446

Number of girls in hostel D = (446 - 130x)

Number of boys in hostel D = 302

ATQ

$$200x - 302 = 98$$

$$x = 2$$

Hostels	Boys	Girls
A	120	260
B	400	200
C	220	780
D	302	186

36. (b): Required percent $= \frac{(302-186)}{(400-200)} \times 100 = 58\%$

37. (a): Required difference $= (302+186) - (120+260) = 108$

38. (a): Required ratio $= \frac{600}{1000} = \frac{3}{5}$

39. (d): Required average $= \frac{100+380+200+282}{4} = 240.5$

40. (b): Total number of boys in hostel A and that of girls in hostel C = 900

$$\text{Required } \% = \frac{900-400}{400} \times 100 = 125\%$$

41. (b): Let, Males and females who use their coupons in Haircutting be 13x and 7x respectively.

$$\Rightarrow \text{Males who use their coupons in Pedicure} = 7x + 72$$

Then Females who use their coupons in Pedicure

$$= 450 - 13x - 7x - 7x - 72 = 378 - 27x$$

Pedicure		Haircutting	
Males	Females	Males	Females
7x+72	378-27x	13x	7x

ATQ,

$$7x + 72 + 13x - (7x + 378 - 27x) = 174$$

$$40x - 306 = 174$$

$$40x = 480$$

$$x = 12$$

Pedicure		Haircutting	
Males	Females	Males	Females
156	54	156	84

$$\text{Required } \% = \frac{156}{156} \times 100 = 100\%$$

42. (e):

Let, Males and females who use their coupons in Haircutting be $13x$ and $7x$ respectively.
 \Rightarrow Males who use their coupons in Pedicure = $7x + 72$
 Then Females who use their coupons in Pedicure = $450 - 13x - 7x - 7x - 72 = 378 - 27x$

Pedicure		Haircutting	
Males	Females	Males	Females
$7x+72$	$378-27x$	$13x$	$7x$

ATQ,

$$7x + 72 + 13x - (7x + 378 - 27x) = 174$$

$$40x - 306 = 174$$

$$40x = 480$$

$$x = 12$$

Pedicure		Haircutting	
Males	Females	Males	Females
156	54	156	84

$$\text{Required Ratio} = \frac{156+54}{156+84} = \frac{210}{240} = \frac{7}{8}$$

43. (c):

Let, Males and females who use their coupons in Haircutting be $13x$ and $7x$ respectively.
 \Rightarrow Males who use their coupons in Pedicure = $7x + 72$
 Then Females who use their coupons in Pedicure = $450 - 13x - 7x - 7x - 72 = 378 - 27x$

Pedicure		Haircutting	
Males	Females	Males	Females
$7x+72$	$378-27x$	$13x$	$7x$

ATQ,

$$7x + 72 + 13x - (7x + 378 - 27x) = 174$$

$$40x - 306 = 174$$

$$40x = 480$$

$$x = 12$$

Pedicure		Haircutting	
Males	Females	Males	Females
156	54	156	84

$$\text{Required difference} = 84 - 54 = 30$$

44. (d):

Let, Males and females who use their coupons in Haircutting be $13x$ and $7x$ respectively.
 \Rightarrow Males who use their coupons in Pedicure = $7x + 72$
 Then Females who use their coupons in Pedicure = $450 - 13x - 7x - 7x - 72 = 378 - 27x$

Pedicure		Haircutting	
Males	Females	Males	Females
$7x+72$	$378-27x$	$13x$	$7x$

ATQ,

$$7x + 72 + 13x - (7x + 378 - 27x) = 174$$

$$40x - 306 = 174$$

$$40x = 480$$

$$x = 12$$

Pedicure		Haircutting	
Males	Females	Males	Females
156	54	156	84

Number of males who use their coupons in Haircutting which doesn't belong to city A

$$= 156 \times \frac{75}{100} = 117$$

45. (a):

Let, Males and females who use their coupons in Haircutting be $13x$ and $7x$ respectively.
 \Rightarrow Males who use their coupons in Pedicure = $7x + 72$
 Then Females who use their coupons in Pedicure = $450 - 13x - 7x - 7x - 72 = 378 - 27x$

Pedicure		Haircutting	
Males	Females	Males	Females
$7x+72$	$378-27x$	$13x$	$7x$

ATQ,

$$7x + 72 + 13x - (7x + 378 - 27x) = 174$$

$$40x - 306 = 174$$

$$40x = 480$$

$$x = 12$$

Pedicure		Haircutting	
Males	Females	Males	Females
156	54	156	84

$$\text{Males who use their coupons in Spa} = 156 \times \frac{5}{4} = 195$$

$$\text{Females who use their coupons in Spa} = 84 \times \frac{11}{6} = 154$$

$$\text{Total number of people who use their coupon in Spa} = 195 + 154 = 349$$

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Previous Years' Questions of Mains

Directions (1 – 6): Read the data carefully and answer the questions.

There are 3 colleges A, B, C offering 3 courses mechanical engineering (ME), chemical engineering (CE) & electrical engineering (EE).

College A: Number of students in ME is 40 less than that of in EE and number of students in CE is 50% more than that of in ME.

College B: Number of students in EE is 20 less than that of in EE in college A. Number of students in CE is 340 which is 40 more than that of in CE in college A. Number of students in EE is $22\frac{2}{9}\%$ more than that of in ME.

College C: Number of students in ME is 40% less than that of in ME in college A. Number of students in CE is 40 less than that of in ME.

Total students in EE in all colleges together are 780.

- How many students are in college C?
(a) 620 (b) 740 (c) 560 (d) 680 (e) 520
- If 10% students of ME course from college A shifted to CE course in college C, then what is the difference between total number of students in CE in college C now and average of students in ME in all colleges now?
(a) 60 (b) 380 (c) 260 (d) 80 (e) 180
- Number of students in EE in college B are what percent more/less than number of students in ME in college C?
(a) 75% (b) $87\frac{1}{3}\%$ (c) $83\frac{1}{3}\%$ (d) $66\frac{2}{3}\%$ (e) 50%
- What is the ratio of total number of students in ME & CE together in college A to total number of students in CE & EE together in college B?
(a) 23 : 27 (b) 25 : 28 (c) 26 : 25 (d) 25 : 26 (e) 27 : 28
- What is the difference between average of total number of students in EE in all colleges and average of total number of students in CE in all colleges?
(a) 30 (b) 60 (c) 40 (d) 20 (e) 50
- Total students in college C are what percent of total students in college A? (approx.)
(a) 79% (b) 70% (c) 100% (d) 73% (e) 85%

Directions (7-11): - Data given below shows number of units of electricity consumed by Fans, Lights and Other appliances in three different houses. Study the data carefully and answer the following questions.

House A → Total number of units consumed in House 'A' is 250 units out of which 120 units are consumed by Other appliances. Units consumed by Fans is 30 less than Units consumed by Lights.

House B → Units consumed by Lights in House 'A' and House 'B' is same. Units consumed by Fans in House 'B' are 60% more than that of fans in House 'A'.

House C → Total units consumed by Lights in all three houses is 200 units and units consumed by Fans and Lights is same in House C. Units consumed by Other appliances is 125% more than that by Fans in this House. Total units consumed by Other appliances in all three houses is 320 units.

- Number of units consumed by Lights in House 'B' is what percent more of the units consumed by Lights in house 'C'?
(a) 100% (b) 200% (c) 120% (d) 50% (e) 150%
- Average number of units consumed by Other appliances in House 'B', 'C' and 'D' is 110 units. Find the units consumed by Other appliances in House 'D'?
(a) 110 units (b) None of the given options (c) 130 units
(d) 120 units (e) 140 units
- Find total number of units consumed in House 'A' and 'C' together?
(a) None of the given options (b) 410 units (c) 430 units
(d) 400 units (e) 420 units
- Find the difference between Units consumed by Other appliances in House 'B' and house 'C'?
(a) 10 units (b) 20 units (c) 30 units (d) None of the given options (e) 40 units
- Total units consumed by Fans and Lights together in House 'C' is what percent less than total units consumed by Lights and Other appliances together in House 'A'?
(a) 20% (b) 40% (c) 50% (d) 60% (e) 80%

Direction (12-16): Study the given passage and answer the following questions.

There are three types of vehicles i.e. 3 Auto, 4 car & one truck which take rides. Distance covered by each type of vehicle per ride is same. Profit per ride of an auto and a car is given as Rs. 20 and Rs. 60 respectively. And total profit of truck in April month is given as Rs. 42000. Ratio of total ride per day of an auto to total ride per day of a car is 3 : 2. Ratio of per ride profit of a Truck to per ride profit of a Car is 70 : 27. And total profit is given as Rs 15920 per day.

12. What is difference in profit earned by all Cars and Truck in seven days?
 (a) Rs. 56,440 (b) Rs. 54,120 (c) Rs. 64,120 (d) Rs. 72,240 (e) None of these
13. Profit made by Truck in two weeks is approximately what percent more or less than profit made in a week by all Auto?
 (a) 29% more (b) 34% less (c) 24% more (d) 39% less (e) 43% more
14. What is the ratio of number of rides by single Car in four weeks to number of rides by Truck in two weeks?
 (a) 44 : 9 (b) 22 : 9 (c) None of these (d) 88 : 9 (e) 11 : 9
15. What is the average of profit made by all Car and all Auto in a week?
 (a) Rs. 50,820 (b) Rs. 48,240 (c) Rs. 56,220 (d) None of these (e) Rs. 64,120
16. What is the total profit of a single car, truck and auto in a day?
 (a) Rs. 4860 (b) Rs. 5360 (c) Rs. 4240 (d) Rs. 5620 (e) None of these

Directions (17-21):- Study the given passage carefully and answer the following questions

A train is travelling from station A to E. At station A, 80 person board in the ratio of male to female of 9 : 7.

At station B, 15 men got down and 5 women boarded the train. At station C, half of the women got down and the same number of men boarded the train

At station D, x number of male got down and now the ratio of male to female in train is 7 : 4

17. If 50% of male who were travelling from B to C do not have a valid ticket and 60% of the female travelling from B to C do not have a valid ticket, then find the number of passengers who are travelling from B to C with invalid ticket?
 (a) 43 (b) 39 (c) 47 (d) 49 (e) 51
18. The number of females travelling from station B to C is approximately how much percent more than the number of males travelling from station D to E?
 (a) 10% (b) 21% (c) 18% (d) 14% (e) 24%
19. Find the difference between the passengers travelling from starting point to destination point?
 (a) 25 (b) 30 (c) 34 (d) 38 (e) none of these
20. Which of the following is true?
 (a) The number of females travelling from station A to B is equal to the no. of males travelling from station D to E
 (b) The total number of passengers travelling from Station C to D is 45% of the no. of males who boarded from the starting point
 (c) The difference between the no. of male and female travelling from station D to E is half of the difference between the no. of males and females travelling from station C to D
 (a) Only A (b) Only C (c) Only A & C (d) Only B & C (e) All A, B and C
21. Find the ratio of total no. of passengers travelling from station D to E and B to C?
 (a) 17 : 13 (b) 11 : 14 (c) 13 : 17 (d) 14 : 11 (e) 17 : 19

Direction (22-26): Data given below shows total expense of a company in three different years.

2015 → Total salary expense of 80 employees is 10 lakhs

2016 → Total expense in this year is same as previous year while salary expense is increased by 26% as compared to previous year and average salary expense is decreased by Rs.500 as compared to previous year.

2017 → Total expense is 60 lakhs which is 20% more than that in 2016. Others expense is 47.5 lakhs. Number of employees is decreased by 5 as compared to previous year.

Total expense = Salary expense + Others expense

Salary expense = Number of employees × Average salary expense

22. Find the ratio between Others expense in 2015 to Salary expense in 2017?
 (a) 1 : 4 (b) 4 : 1 (c) None of the given options
 (d) 5 : 16 (e) 16 : 5

23. Average salary expense in 2015 is what percent less than that in 2017?
 (a) None of the given options (b) 10% (c) 15%
 (d) 5% (e) 25%
24. If average employees in 2015, 2017 and 2018 is 82. Find number of employees in 2018?
 (a) 86 (b) None of the given options (c) 76
 (d) 66 (e) 56
25. Female employees in 2016 is 45 more than male employees in 2016. Find the ratio between male to female employees in 2016?
 (a) 11 : 9 (b) 5 : 2 (c) 2 : 5
 (d) 9 : 11 (e) None of the given options
26. Find the difference between Salary expense in 2017 to Salary expense in 2016?
 (a) 10,000 (b) 90,000 (c) 60,000
 (d) 40,000 (e) None of the given options

Direction (27-29): Population of two villages X and Z are 16,000 and 12,800 respectively. Ratio of population of village X to that of Y is 4 : 5. Three manufacturers, A, B and C supply cycles in these three villages. These manufactures manufactured cycles in the ratio of 22: 19 : 20 (A : B : C) by assuming that each person will buy one cycle and 60%, 75% and 80% of the cycles manufactured by A, B and C respectively are sold and selling price of each cycle is Rs. 8,000.

$$(i) \text{ Supply} = \frac{\text{Revenue}}{\text{Selling price of a cycle}}$$

$$(ii) \text{ Demand \%} = \frac{\text{Number of cycles ordered by customers}}{\text{Total number of cycles remained with manufacturer}} \times 100$$

$$(iii) \text{ Revenue} = 8000 \times \text{number of cycles supplied}$$

Use the above information to answer the following questions.

27. What is the revenue generated from village Y, if each person of village X and Z purchased a cycle?
 (a) 8.424 crore (b) 4.768 crore (c) 6.348 crore (d) 9.00 crore (e) 10.246 crore
28. What is the profit earned by manufacture C from village X, if total revenue earned by all three manufacturers in village X is 9.6 crore and number of cycles supply by all of them are equal and cost price of each cycle is 6000?
 (a) 90 lakh (b) 50 lakh (c) 75 lakh (d) 80 lakh (e) 43 lakh
29. On a particular day, there was a demand of 50% for manufacturer A and 10 % for manufacturer C from an another village M which they delivered on the same day. Find that total revenue earned by these two manufacturer together is approximately what percent of their manufacturing cost? Given that manufacturing cost of a cycle is Rs. 6000.
 (a) 95% (b) 90% (c) 107% (d) 120% (e) 113%

Directions (30-32): Given below is the information about wind mills in four different villages A, B and C and D. Number of wind mills in villages A, B, C and D are 24, 20, 15 and 12 respectively. Number of electricity units produced in one week by one wind mill when they operate with maximum efficiency in village A, B, C and D is 2 lakh units/week, 80000 units/week, 1 Lakh units/week and 1.5 Lakh units/week respectively. Number of houses in each village A, B, C and D are 540, 240, 150 and 350 respectively. Total units produced are consumed equally by each house in the village

→ Different number of winds mills are operate in four different weeks

In first week number of wind mills are operative in village A, B, C and D are 75%, 50%, 40% and 75% respectively. In second week it is 50%, 75%, 60% and 50% respectively. In third week it is 75%, 100%, 80% and 50% respectively. In fourth week it is 100%, 50%, 60% and 75% respectively.

→ Given below is the three ranges of efficiency of a wind mills (number of unit produced /Week by one mill)

Efficiency Type	Range
Efficiency 1	60% - 70%
Efficiency 2	45% - 55%
Efficiency 3	30% - 40%

Three wind mills also operate on different levels

- level 1 : Consider upper limit of range of efficiency
- level 2 : consider mid of range of efficiency
- level 3 : consider the lower range of efficiency

Eg. If a wind mill is operative at efficiency 2 then its level 2 efficiency will be $= \frac{45+55}{2} = 50\%$

Its level 1 efficiency will be 55%

Its level 3 efficiency will be 45%

30. What is the ratio of total production of village A in First week at level 1 of efficiency 2 to the total production of village B in second week at Level 2 of efficiency 1.

- (a) 20 : 13 (b) 33 : 13 (c) 33 : 19 (d) 27 : 19 (e) 27 : 13

31. Total units produced in village C in second and fourth week at level 1 of efficiency range 1 is what percent of total units produced in village A in first and fourth week at level 2 of efficiency range 1

- (a) $25\frac{7}{13}\%$ (b) $23\frac{21}{273}\%$ (c) $13\frac{12}{13}\%$ (d) $22\frac{5}{13}\%$ (e) $24\frac{5}{13}\%$

32. What is the ratio of units consumed per house in village B in week 4 operating at level 3 of Efficiency range 3 to the units consumed per house in second week at level 1 of efficiency range 2 of the village C?

- (a) 5 : 6 (b) 13 : 19 (c) 15 : 19 (d) 13 : 33 (e) 10 : 33

Directions (33 – 37): Given data is regarding three automatic toys on two types of movements: Neck movements (NM) and Hand rotation (HR). it recorded from 9 AM onwards on 12 June. Each toy has different battery percentage and battery capacity.

Toy A: Battery Capacity = 1500 units, Battery Percent = 80%

At every 4th NM and 3rd HR together, 1 unit of battery is consumed. Toy A gets completely discharged at 11 AM.

Toy B: Battery Capacity = 2000 units, Battery percent = 75%

NM = 30/min, HR = 50% of NM/min of toy A. At every 3rd NM and 2nd HR together, 1 unit of battery is consumed.

Toy C: Battery Capacity = 120% of battery capacity of toy B, Battery Percent = 60%

NM = NM of toy A + 5, HR = 30/min. at every 3rd NM and 2nd HR together. 1 unit of battery is consumed.

33. If toy B & A had been charged completely (100%) then what would be the difference between time taken by both the toys to get discharged completely?

- (a) 50 min (b) 90 min (c) 0 min (d) 15 min (e) 10 min

34. What is the difference between total NM and HR of toy C when the battery of toy C get completely discharged? (consider available battery capacity)

- (a) 1620 (b) 1440 (c) 1920 (d) 1200 (e) 1280

35. If power consumed per NM of toy B is 0.1 unit, then what is power consumed per HR of that day?

- (a) 0.45 unit (b) 0.35 unit (c) 0.15 unit (d) 0.2 unit (e) 0.8 unit

36. Total number of NM of all the three toys together is what percent more than total number of HR of all the three toys together?

- (a) 63.5% (b) 52.25% (c) 46.5% (d) 48.25% (e) 43.75%

37. If toy C would be 100% charged then at what time battery will drain completely.

- (a) 11:30 AM (b) 11:45 AM (c) 11:35 AM (d) 11:40 AM (e) 11:50 AM

Previous Years' Solutions of Mains

Sol. (1 – 6):

College A: let no. of students in ME = $2x$

Students in EE = $2x + 40$

Students in CE = $3x$

College B: students in EE = $2x + 20$

Students in CE = $340 = 40 + 3x$

Students in ME = $\frac{9}{11}(2x + 20)$

College C: students in ME = $1.2x$

Students in CE = $1.2x - 40$

Students in EE = $780 - (2x + 40 + 2x + 20) = 720 - 4x$

On solving, $x = 100$

College \ Course	ME	CE	EE	Total
A	200	300	240	740
B	180	340	220	740
C	120	80	320	520

1. (e): students in C = 520
2. (a): students who shifted to CE in college C from ME in college A = 20
Students in CE in college C now = $80+20 = 100$
Average of students in ME of all colleges = $\frac{180+180+120}{3} = 160$
Required difference = $160 - 100 = 60$
3. (c): required % = $\frac{220-120}{120} \times 100 = 83\frac{1}{3}\%$
4. (b): required ratio = $(200 + 300) : (340 + 220) = 500 : 560$
 $= 25 : 28$
5. (d): required difference = $\frac{240+220+320}{3} - \frac{300+340+80}{3} = 20$
6. (b): required % = $\frac{520}{740} \times 100 = 70\%$ (approx)

Solution (7-11): -**House A** →

Units consumed by Other appliances = 120 units

Let unit consumed by Lights = x Then, Units consumed by Fans = $x - 30$

$$x + x - 30 = 250 - 120$$

$$2x = 130 + 30$$

$$x = 80$$

Units consumed by Lights = 80 units

Units consumed by Fans = 50 units

House B →

Units consumed by Lights = 80 units

$$\text{Units consumed by Fans} = \frac{160}{100} \times 50 = 80 \text{ units}$$

House C →

Total units consumed by Lights in all three houses = 200 units

$$\Rightarrow \text{Units consumed by Lights in house 'C'} = 200 - 80 - 80 = 40 \text{ units}$$

Units consumed by Fans = 40 units

$$\text{Units consumed by Other appliances} = 40 \times \frac{225}{100} = 90 \text{ units}$$

$$\text{Total units consumed by Other appliances in House 'B'} = 320 - 90 - 120 = 110 \text{ units}$$

Units Consumed	Fan	Light	Other appliances
House A	50	80	120
House B	80	80	110
House C	40	40	90

7. (a): Required % = $\frac{80-40}{40} \times 100 = 100\%$
8. (c): Total number of units consumed by Other appliances in House 'B', 'C' and 'D' together = $110 \times 3 = 330 \text{ units}$
Units consumed by Other appliances in House 'D' = $330 - 110 - 90 = 130 \text{ units}$

9. (e): Total units consumed in House 'A' and 'C' together = $50 + 80 + 120 + 40 + 40 + 90 = 420 \text{ units}$
10. (b): Required difference = $110 - 90 = 20 \text{ units}$
11. (d): Total units consumed by Fans and Lights in House 'C' = $40 + 40 = 80 \text{ units}$
Total units consumed By Lights and Other appliances in House 'A' = $80 + 120 = 200 \text{ units}$
Required % = $\frac{200-80}{200} \times 100 = \frac{120}{200} \times 100 = 60\%$
12. (b): Dry waste produced on Thursday = $\frac{800 \times 15}{100} - \frac{16 \times 500}{100}$
 $= 120 - 80 = 40 \text{ kg}$
Dry waste produced on Saturday = $\frac{120}{100} \times 40 = 48 \text{ kg}$
Dry waste produced on Monday = $\frac{20 \times 800}{100} - \frac{22 \times 500}{100}$
 $= 160 - 110 = 50 \text{ kg}$
Total sum = $50 + 48 = 98 \text{ kg}$
13. (d): Dry waste on Tuesday = $\frac{18 \times 800}{100} - \frac{24 \times 500}{100}$
 $= 144 - 120 = 24 \text{ kg}$
Dry waste on Wednesday = $\frac{23 \times 800}{100} - \frac{18 \times 500}{100}$
 $= 184 - 90 = 94 \text{ kg}$
Required % = $\frac{24}{94} \times 100 = \frac{1200}{47}\% = 25\frac{25}{47}\%$
14. (a): Dry waste on Friday = $\frac{24 \times 800}{100} - \frac{20 \times 500}{100}$
 $= 92 \text{ kg}$
Wet waste on Monday and Wednesday together = $\frac{22+18}{100} \times 500 = 200 \text{ kg}$
Ratio = $\frac{92}{200} = \frac{23}{50}$
15. (e): Dry waste produced on Thursday = $\frac{15 \times 800}{100} - \frac{16 \times 500}{100} = 40 \text{ kg}$
Total waste produced on Sunday = $40 \times \frac{220}{100} = 88 \text{ kg}$
Dry waste produced on Monday = $\frac{20 \times 800}{100} - \frac{22 \times 500}{100}$
 $= 160 - 110 = 50 \text{ kg}$
Dry waste produced on Sunday = $\frac{4}{5} \times 50 = 40 \text{ kg}$
Wet waste produced on Sunday = $88 - 40 = 48 \text{ kg}$
16. (c): Wet waste on Tuesday & Wednesday together = $\frac{(24+18)}{100} \times 500 = 210$
Dry waste on Thursday and Friday together = $\frac{(24+15)}{100} \times 800 - \frac{(20+16)}{100} \times 500 = 132 \text{ kg}$
Required difference = $210 \text{ kg} - 132 \text{ kg} = 78 \text{ kg}$

Sol (17- 21):

As given, at station A, 80 person board and the ratio of male to female is 9: 7, therefore there will be 45 male and 35 female

Then at station B, 15 men got down and 5 women board the train, therefore total men at station B be 30 and total female is 40

Then at station C, half of the women got down and same no. of men boarded the train, then total male will be 50 and total female will be 20

Finally at station D, x no. of male got down and ratio of male to female is 7 : 4, then total no. of male will be 35 and total female will be 20

STATION	Male	Female
A	45	35
B	30	40
C	50	20
D	50 - x = 35	20

17. (b): Total males who does not have a valid ticket from Station B to C = $30 \times \frac{50}{100} = 15$

Total females who does not have a valid ticket from Station B to C = $40 \times \frac{60}{100} = 24$

Total invalid ticket travellers from Station B to C = $15 + 24 = 39$

18. (d): Total no. of females travelling from station B to C = 40

Total no. of males travelling from station D to E = 35

Required percentage = $\frac{40-35}{35} \times 100 = 14.28\%$
= 14% (approx.)

19. (a): Total no. of passengers travelling at starting point = $45 + 35 = 80$

Total no. of passengers travelling till destination point = $35 + 20 = 55$

Required difference = $80 - 55 = 25$

20. (c): In Statement A,

Total no. of females travelling from station A to B = 35

Total no. of males travelling from station D to E = 35

Therefore, Statement A is true

In Statement B,

Total no. of passengers travelling from station C to D = 70

Total no. of males who boarded from the starting point = 45

Therefore, Statement B is false

In Statement C,

Difference between no. of males and females travelling from station D to E = $35 - 20 = 15$

Difference between no. of males and females travelling from station C to D = $50 - 20 = 30$

Therefore, statement C is true

Therefore Statement A and C is true

21. (b): total no. of passengers travelling from station D to E = $35 + 20 = 55$

total no. of passengers travelling from station B to C = $30 + 40 = 70$

Required ratio = $\frac{55}{70} = 11:14$

Solution (22-26)

In 2015, Average salary expense = $\frac{10,00,000}{80} = 12,500$

In 2016, Average salary expense = $12,500 - 500 = 12,000$

Total expense in 2017 = 60 lakh

\Rightarrow Total expense in 2016 and 2015 each = $\frac{100}{120} \times$

$60,00,000 = 50,00,000 = 50$ lakh

Total salary expense in 2017 = $60 - 47.5 = 12.5$ lakh

Total salary expense in 2016

= $\frac{126}{100} \times 10,00,000 = 12,60,000$

Number of employees in 2016 = $\frac{12,60,000}{12,000} = 105$

Number of employees in 2017 = $105 - 5 = 100$

In 2017, Average salary expense = $\frac{12,50,000}{100} = 12,500$

Year	Average salary expense	Number of employees	Salary Expense	Others expense	Total expense
2015	12,500	80	10 lakhs	40 lakhs	50 lakhs
2016	12,000	105	12.6 lakhs	37.4 lakhs	50 lakhs
2017	12,500	100	12.5 lakhs	47.5 lakhs	60 lakhs

22. (e): Required ratio = $\frac{40}{12.5} = \frac{16}{5}$

23. (a): Required % = $\frac{12,500 - 12,500}{12,500} \times 100 = 0\%$

24. (d): Number of employees in 2018 = $82 \times 3 - 100 - 80 = 246 - 100 - 80 = 66$

25. (c): Let total male employees in 2016 = y
 \Rightarrow Female employees in 2016 = y + 45

ATQ,

$y + y + 45 = 105$

$\Rightarrow y = 30$

Total male employees in 2016 = 30

Female employees in 2016 = 75

Required ratio = $\frac{30}{75} = \frac{2}{5}$

26. (a): Required difference
= $12.6 \text{ lakh} - 12.5 \text{ lakh} = 0.1 \text{ lakh} = 10,000$

27. (b): Total population in X and Z is 16000 and 12800

Population in Y $\Rightarrow \frac{16000}{4} \times 5 = 20,000$

Cycle manufactured by A, B and C = $16000 + 12800 + 20000 = 48800$

Total cycle manufacture by A

= $\frac{48800}{61} \times 22 = 17600$

$$\text{By B} = \frac{48800}{61} \times 19 = 15200$$

$$\text{By C} = \frac{48800}{61} \times 20 = 16000$$

$$\text{Cycle supplied by A} = \frac{60}{100} \times 17600 = 10560$$

$$\text{By B} = \frac{75}{100} \times 15200 = 11400$$

$$\text{By C} = \frac{80}{100} \times 16000 = 12800$$

$$\text{Cycle supplied in Y} = 10560 + 11400 + 12800 - 16000 - 12800 = 5960$$

$$\text{Revenue} = 8000 \times 5960 = 47680000 = 4.768 \text{ cr.}$$

28. (d): Total revenue = 9.6 cr

$$\text{Total cycle supplied} = \frac{\text{Revenue}}{8000} = \frac{9.6 \text{ cr}}{8000} = 12000$$

$$\text{Cycles supplied by C} = \frac{12000}{3} = 4000$$

$$\text{Total profit} = 4000 \times (8000 - 6000) = 80 \text{ lakh}$$

29. (c): Total cycles manufactured by A = 17600

Total cycles manufactured by C = 16000

Cycle remained with A = 17600 - 10560 = 7040

Cycle remained with C = 16000 - 12800 = 3200

Cycles delivered by manufacturer A or number of cycles demanded from manufacturer A
 $= (50 \times 7040) / 100 = 3520$

Similarly,

$$\text{New number of supplied by C} = \frac{3200 \times 10}{100} = 320$$

Total revenue of A and C = $(10560 + 3520 + 12800 + 320) \times 8000$
 $= 21.76 \text{ crore.}$

Total manufacturing cost by A and C

$$= (17600 + 16000) \times 6000$$

= 20.16 cr.

$$\text{Required \%} = \frac{21.712}{20.16} \times 100 \approx 107\%$$

Solution (30 - 32):

Village	No. of wind mills	Maximum units produced	No. of houses	Wind mills operative			
				Week 1	Week 2	Week 3	Week 4
A	24	2 lakh/week	540	75%	50%	75%	100%
B	20	80000 /week	240	50%	75%	100%	50%
C	15	1 lakh/week	150	40%	60%	80%	60%
D	12	1.5 lakh/week	350	75%	50%	50%	75%

30. (b): Number of mills operative in week 1 of village A

$$= \frac{75}{100} \times 24 = 18$$

Level 1 (upper limit) of efficiency range 2 means 55%

Total units produced in village A in first week when operated at level 1 of efficiency range 2

$$= 18 \times \frac{55}{100} \times 2$$

Similarly,

Number of mills operative in village B in week 2

$$= \frac{75}{100} \times 20 = 15$$

level 2 (mid limit) of efficiency Range 1 = $\frac{60+70}{2} \% = 65\%$

Total units produced in village B in week 2 when operated at level 2 of efficiency range 1

$$= 15 \times \frac{65}{100} \times .8$$

$$\text{Required ratio} = \frac{18 \times \frac{55}{100} \times 2}{15 \times \frac{65}{100} \times .8} = 33 : 13$$

31. (b): Mills operating in village C in week second and fourth is $\frac{3}{5} \times 15$ and $\frac{3}{5} \times 15$ respectively.

Total units produced at level 1 of efficiency range 1

$$= (9 + 9) \times 100,000 \times \frac{70}{100}$$

$$= 18 \times 1000 \times 70$$

$$= 1260000$$

Mills operating in village A in first and fourth week is $24 \times \frac{3}{4}$ and 24 respectively

Total units produced at level 2 of efficiency range 1

$$= (18 + 24) \times 200000 \times \frac{65}{100}$$

$$= 42 \times 2000 \times 65$$

$$= 5,460,000 \text{ units}$$

$$\text{Required percentage} = \frac{126}{546} \times 100$$

$$= 23 \frac{21}{273} \%$$

32. (e): No. of mills operating in B in fourth week

$$= 20 \times \frac{50}{100} = 10$$

Total units consumed at level 3 of efficiency range

$$3 \text{ per house} = \frac{10 \times 80000 \times 30}{240 \times 100}$$

$$= 1000 \text{ units/house}$$

No. of mills operating in C in second week

$$= 15 \times \frac{60}{100} = 9$$

Total units consumed at level 1 of efficiency range

$$2 = \frac{9 \times 1,00,000}{150} \times \frac{55}{100}$$

$$= 3300 \text{ unit/house}$$

$$\text{Required ratio} = 10 : 33$$

Sol (33 – 37):**TOY A:**

Battery available = 1200 units

Battery in operation = 11:00 – 9:00 = 2 hrs = 120 min

4NM + 3HR = 1 unit

4800 NM + 3600 HR = 1200 unit

To find per minute NM & HR, divide whole equation by the time for which battery remained in operation

40 NM/min + 30 HR/min = 10 unit/min

NM (A) = 40 per min

HR (A) = 30 per min

TOY B:

NM (B) = 30 per min

HR (B) = 20 per min

3NM + 2HR = 1 unit

Battery available = 1500 units

4500 NM + 3000 HR = 1500 unit

Since we know per min HR & NM, dividing by this we can find time for which battery remains operational

Time = 150 min = 2.5 hrs

TOY C:

NM (C) = 45 per min

HR (C) = 30 per min

Battery capacity = 2400 units

Battery available = 1440 units

3NM + 2HR = 1 unit

4320 NM + 2880 HR = 1440 unit

Since we know per min HR & NM, dividing by this we can find time for which battery remains operational

Time = 96 min = 1 hr 36 min

	Total Battery (units)	Available Battery (units)	NM (per min)	HR (per min)	Battery Operational Time (hrs)
A	1500	1200	40	30	2 (120 min)
B	2000	1500	30	20	2.5 (150 min)
C	2400	1440	45	30	1.6 (96 min)

33. (a): TOY A

4NM + 3HR = 1

6000 NM + 4500 HR = 1500 units

Operational time, divide by per min consumption

$$\text{Time} = \frac{6000}{40} = \frac{4500}{30} = 150 \text{ min}$$

TOY B

3NM + 2HR = 1

6000 NM + 4000 HR = 2000 units

Operational time, divide by per min consumption

$$\text{Time} = \frac{6000}{30} = \frac{4000}{20} = 200 \text{ min}$$

Required time difference = 200 – 150 = 50 min

34. (b): total NM = 45 × 96 = 4320

Total HR = 30 × 96 = 2880

Required difference = 4320 – 2880 = 1440

35. (b): 3NM + 2HR = 1 unit

3 × 0.1 + 2HR = 1

HR = 0.35 unit per min

36. (e): total NM = 40 + 30 + 45 = 115

Total HR = 30 + 20 + 30 = 80

$$\text{Required \%} = \frac{115-80}{80} \times 100 = 43.75\%$$

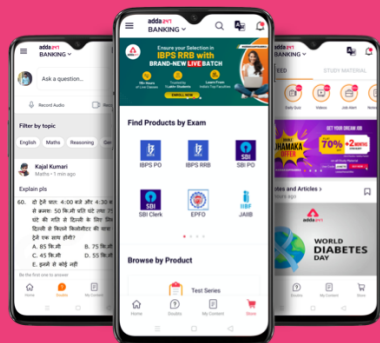
37. (d): 3NM + 2HR = 1 unit

7200 NM + 4800 HR = 2400 unit

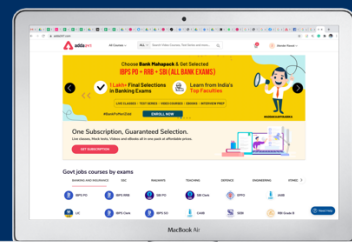
Operational time, divide by per min consumption

$$\text{Time} = \frac{7200}{45} = \frac{4800}{30} = 160 \text{ min or } 2 \text{ hr } 40 \text{ min}$$

Required time = 9:00 + 2:40 = 11:40 AM

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Venn Diagram Caselet DI-II

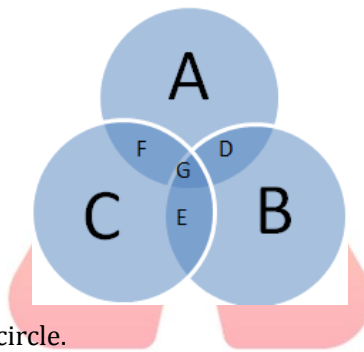
(ii) **Venn Diagram Based Caselet DI** – Whose solution can be represented in the form of Venn diagram.

Before start solving Venn Diagram Based Caselet DI, you must have knowledge of following things.

- How to draw a Venn diagram on the basis of given information.
- Knowledge of Venn diagram.
- Knowledge Ratio and proportion, percentage and the relationship between fractions and their percentage forms, Average etc.
- Knowledge of addition, subtraction, Divide & multiplication etc.

To make the Venn Diagram Based Caselet DI more clear let an example.

Example - In a college, some students like English, some like Maths and some like Science. Some like both English and Maths but not Science, some like both Maths and Science but not English and Some like both Science and English but not Maths. Some like all three subjects.



Here, A, B and C are representing the whole circle.

A representing some like English, B representing some like Maths and C representing some like Science.

D representing some like both English and Maths but not Science, E representing some like both Maths and Science but not English and F representing some like both Science and English but not Maths. G representing some like all these three subjects.

After arranging the information in Venn diagram, we conclude following more information:

Students who like only English= $A - (D + F + G)$.

Students who like only Maths= $B - (D + E + G)$.

Students who like only Science= $C - (E + F + G)$.

Venn Diagram Based Caselet DI contains:

- Concept with Solved Examples
- Practice MCQs for Prelims
- Practice MCQs for Mains
- Previous Years' Questions of Prelims
- Previous Years' Questions of Mains

Solved Example

Directions (1-5): Study the given data carefully and answer the following questions

In a library there are two type of people, one who reads English newspaper and another who reads Hindi newspaper. Total 40 (male + female) reads both (English + Hindi) newspaper, which is half of male who reads only English newspaper. 30 female reads both (English and Hindi) newspaper, which is 25% of female who reads only English newspaper. The ratio of male to female who reads only Hindi newspaper is 7:9.

Total no. of female who reads only Hindi and only English newspaper together are 40% more than total males who read only Hindi and English Newspaper together.

1. How many people (male + female) reads only Hindi newspaper?
 (a) 128 (b) 192 (c) 160 (d) 80 (e) 64
2. No. of male who reads only English newspaper are what percent of female who reads Hindi newspaper?
 (a) 70% (b) 88.89% (c) 66.67% (d) 80% (e) None of these.
3. What is the difference between total no. of male and female?
 (a) 40 (b) 60 (c) 50 (d) 80 (e) 30
4. What is the ratio of no. of people (male+ female) who reads both newspaper to no. of female who reads only Hindi?
 (a) 4:9 (b) 2:5 (c) 5:7 (d) 3:7 (e) 4:7
5. No. of female who read English newspaper are what percent of total no. of people (male + female)?
 (a) 65.5% (b) 30% (c) 33.33% (d) 37.5% (e) None of these.

Sol (1-5):

No. of male who reads only English newspaper = $40 \times 2 = 80$

No. of female who reads only English newspaper = $\frac{30}{25} \times 100 = 120$

Let males and females who read only Hindi newspaper be $7x$ and $9x$ respectively

So,

$$(120 + 9x) = \frac{140}{100} (80 + 7x)$$

$$600 + 45x = 560 + 49x$$

$$x = 10$$

No. of male who reads only Hindi newspaper = $7x = 70$

No. of female who reads only Hindi newspaper = $9x = 90$

No. of male who reads both (Hindi + English) newspaper = $40 - 30 = 10$

1. **(c):** Required no. of people = 160
2. **(c):** No. of female who reads Hindi newspaper = $90 + 30 = 120$
 Required percentage = $\frac{80}{120} \times 100 = 66.67\%$
3. **(d):** required difference = $120 + 30 + 90 - 80 - 10 - 70 = 80$
4. **(a):** required ratio = $40:90 = 4:9$
5. **(d):** required percentage = $\frac{120+30}{400} \times 100 = 37.5\%$

Directions (6-10): Read the passage given below and answer the following questions.

A school has a total of 990 students. Each student has to select at least 1 sport among Cricket, Football and Badminton.

Students who play only Badminton are 50% of students who play only Football and ratio of students who play only Cricket to students who play only Badminton is 5:2. Students who play all 3 games together are 50% of students who play only Badminton. Students who play both Cricket and Badminton together are equal to students who play both Football and Badminton but not Cricket. Students who play both Cricket and Football but not Badminton are 50% more than students who play all 3 games together. Students who play both Cricket and Football but not Badminton are 50% of students who play both Football and Badminton together.

6. Find the total number of students who play Football.
(a) 510 (b) 560 (c) 530 (d) 500 (e) 480
7. Find the number of students who play Cricket and Football together are how much more or less than number of students who play only Football?
(a) 150 (b) 80 (c) 110 (d) 90 (e) 140
8. Find the total number of students who play at least 2 games.
(a) 260 (b) 280 (c) 360 (d) 330 (e) 300
9. Total number of students who play Cricket are what percent more or less than total number of students who play Badminton?
(a) $48\frac{2}{3}\%$ (b) $46\frac{1}{3}\%$ (c) $41\frac{2}{3}\%$ (d) $37\frac{1}{3}\%$ (e) None of the above.
10. Total number of students who play exactly 1 more game along with Cricket are how much more or less than total number of students who play exactly 2 more game along with Football.
(a) 150 (b) 210 (c) 180 (d) 90 (e) 130

Sol (6-10):

Let students who play only Football be $20x$.

So, students who play only Badminton = $10x$

And, students who play only Cricket = $25x$

Now, students who play all 3 games together = $5x$

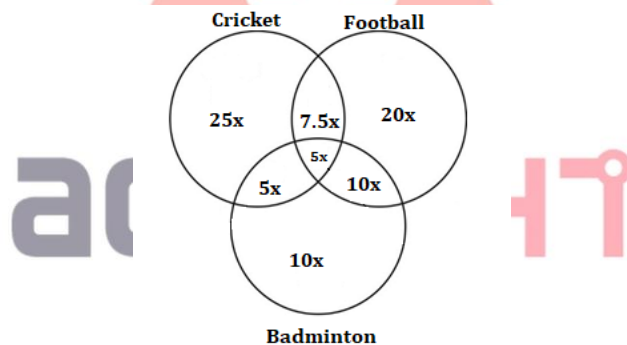
Now, students who play Cricket and Football but not Badminton = $7.5x$

And, students who play Football and Badminton together = $15x$

Now, students who play Football and Badminton but not Cricket = $10x$

Now, students who play both Cricket and Badminton together = $10x$

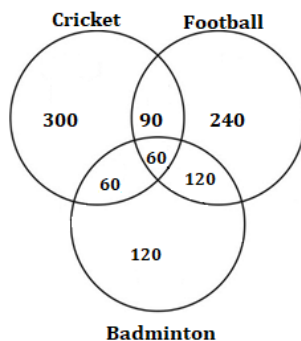
So, students who play Cricket and Badminton but not Football = $5x$



ATQ,

$$25x + 7.5x + 20x + 5x + 5x + 10x + 10x = 990$$

$$x = 12$$



6. (a): Required number of students = $90 + 240 + 60 + 120 = 510$
7. (d): Students playing Cricket and Football together = $90 + 60 = 150$
Required difference = $240 - 150 = 90$

8. (d): Required number of students = $90 + 60 + 60 + 120 = 330$
9. (c): Total number of students who play Cricket = $300 + 90 + 60 + 60 = 510$
 Total number of students who play Badminton = $60 + 60 + 120 + 120 = 360$
 Required % = $\frac{510-360}{360} \times 100 = 41\frac{2}{3}\%$
10. (d): Total number of students who play exactly 1 more game along with Cricket = $90 + 60 = 150$
 Total number of students who play exactly 2 more game along with Football = 60
 Required difference = $150 - 60 = 90$

Directions (11-15): Study the information carefully and answer the questions.

A school consists of 2800 students. The ratio of boys to girls is 5 : 9. All the enrolled students have at least one favourite place — Darjeeling, Singapore and Paris. 12% of the boys like only Singapore. 16% of the girls like only Darjeeling. The number of students who like only Paris is 925. One-fourth of the boys like all the three places. The number of girls who like only Singapore is 250% of the boys who like only the same city. The remaining girls like only all the three places. 23% of enrolled boys like only Darjeeling and the remaining like only Paris. No student likes any combination of only two cities.

11. What is the ratio of the number of boys who like only Darjeeling to the number of girls who like only the same place?
 (a) 144 : 115 (b) 115 : 144 (c) 110 : 113 (d) 110 : 113 (e) 113 : 110
12. What is the number of girls who like all three places?
 (a) 1212 (b) 812 (c) 1012 (d) 1112 (e) 687
13. The number of boys who like only Paris is what per cent of the no. of girls who like only the same city? (Approx.)
 (a) 76 (b) 73 (c) 78 (d) 82 (e) 75
14. How many students like Singapore?
 (a) 670 (b) 1120 (c) 1882 (d) 1656 (e) 1357
15. How many boys like Darjeeling?
 (a) 400 (b) 420 (c) 440 (d) 480 (e) 230

Solution (11-15): Number of boys = $\frac{5}{14} \times 2800 = 1000$

Number of girls = $\frac{9}{14} \times 2800 = 1800$

Number of boys who like only Singapore = $\frac{12}{100} \times 1000 = 120$

Number of girls who like only Singapore = $\frac{250}{100} \times 120 = 300$

Number of girls who like only Darjeeling = $1800 \times \frac{16}{100} = 288$

Number of boys who like only Darjeeling = $1000 \times \frac{23}{100} = 230$

Number of students who like only Paris = 925

No. of boys who like only all three cities = $1000 \times \frac{1}{4} = 250$

No. of boys who like only Paris = $1000 - (120 + 230 + 250) = 400$

No. of girls who like only Paris = $925 - 400 = 525$

No. of girls who like only all three cities = $1800 - (300 + 288 + 525) = 687$

11. (b): Req. ratio = $230 : 288 = 115 : 144$

12. (e): 687

13. (a): Req. % = $\frac{400}{525} \times 100 \approx 76\%$

14. (e): Number of students who like Singapore = $120 + 300 + 250 + 687 = 1357$

15. (d): Number of boys who liked Darjeeing = $230 + 250 = 480$

Directions (16-20): Study the following information carefully and answer the following questions:

In an inter school sports tournament a total of 2350 students participated either in 1 or 2 or all of 3 games. The 3 games are cricket, volleyball and basketball.

The total number of boys who participated is 650 more than the total number of girls who participated.

Out of the total boys, $\frac{1}{6}$ th of the boys participated in cricket only, while the number of boys who participated in basketball only is 40% more than the number of boys who participated in cricket only. The number of boys who participated in volleyball only is $28\frac{4}{7}\%$ less than the number of boys who participated in basketball only. 15% of the total boys participated in basketball and volleyball only, which is 50% more than the number of boys who participated in cricket and volleyball only. $\frac{1}{15}$ of the boys participated in cricket and basketball only. Remaining boys participated in all the 3 games.

$23\frac{9}{17}\%$ of the girls participated in basketball only, which is $11\frac{1}{9}\%$ less than the number of girls who participated in volleyball only. The ratio of number of girls who participated in cricket only to those who participated in volleyball only is 7 : 9. The number of girls who participated in cricket and basketball only is equal to number of girls who participated in basketball and volleyball only and is $\frac{3}{34}$ of the total number of girls. 50 girls participated in cricket and volleyball only. Remaining girls participated in all of the 3 games.

16. How many students have participated in all 3 games ?

- (a) 175 (b) 75 (c) 50 (d) 225 (e) 250

17. What is the total number of boys who are participating in at least 2 games ?

- (a) 550 (b) 650 (c) 750 (d) 800 (e) 700

18. No. of girls participating in volleyball only is what percent of total girls who are participating in the games ?

- (a) $47\frac{3}{17}\%$ (b) $47\frac{5}{17}\%$ (c) $47\frac{1}{17}\%$ (d) $49\frac{4}{15}\%$ (e) $26\frac{8}{17}\%$

19. What is the percentage of the total number of students who participated in basketball but not in volleyball ? (round off to 2 decimal places)

- (a) $32\frac{40}{47}\%$ (b) $29\frac{40}{47}\%$ (c) $26\frac{40}{47}\%$ (d) $30\frac{40}{47}\%$ (e) $31\frac{40}{47}\%$

20. Find the difference between the total number of boys playing basketball in all and the total number of girls playing volleyball in all.

- (a) 350 (b) 375 (c) 400 (d) 425 (e) 450

Solutions (16-20):

$$\text{Total girls who participated} = \frac{2350-650}{2} = 850$$

$$\text{Total boys who participated in the games} = 850 + 650 = 1500$$

$$\text{No. of boys who participated in cricket only} = \frac{1}{6} \times 1500 = 250$$

$$\text{No. of boys who participated in basketball only} = \frac{140}{100} \times 250 = 350$$

$$\text{No. of boys who participated in Volleyball only} = 350 \times \left(1 - \frac{2}{7}\right) = 250$$

$$\text{No. of boys who participated in basketball and volleyball only} = \frac{15}{100} \times 1500 = 225$$

$$\text{No. of boys who participated in cricket and volleyball only} = \frac{100}{150} \times 225 = 150$$

$$\text{No. of boys who participated in cricket and basketball only} = \frac{1}{15} \times 1500 = 100$$

$$\begin{aligned} \text{No. of boys who participated in all the three games} \\ = 1500 - (250 + 350 + 250 + 225 + 150 + 100) = 175 \end{aligned}$$

$$\text{No. of girls who participated in basketball only} = 850 \times \frac{4}{17} = 200$$

$$\text{No. of girls who participated in Volleyball only} = 200 \times \frac{9}{8} = 225$$

$$\text{No. of girls who participated in cricket only} = 225 \times \frac{7}{9} = 175$$

$$\text{No. of girls who participated in cricket and basketball only} = \frac{3}{34} \times 850$$

= 75 = Total no. of girls who participated in basketball and volleyball only

No. of girls who participated in cricket and Volleyball only = 50

No. of girls who participated in all the three games

$$= 850 - (200 + 225 + 175 + 75 + 50 + 75) = 50$$

16. (d); No. of students who participated in all the three games = $175 + 50 = 225$

17. (b); Required no. of boys = $225 + 150 + 100 + 175 = 650$

18. (e); Required percentage = $\frac{225}{850} \times 100 = 26\frac{8}{17}\%$

19. (d); Total no. of students who participated in basketball but not in Volley Ball = $350 + 100 + 200 + 75 = 725$

$$\therefore \text{Required percentage} = \frac{725}{2350} \times 100 = 30\frac{40}{47}\%$$

20. (e); Required difference

$$= (350 + 225 + 100 + 175) - (225 + 75 + 50 + 50) = 850 - 400 = 450$$

Directions (21-25): Study the following information carefully and answer the questions given below it.

In a sports event there are three categories of race (100 m, 200 m, 400 m). Total 200 athletes participated in that event. The number of athletes who participated only in 100m race is 30% of total number of athletes, and among them 1/3rd are females. Number of athletes who participated in 200m race only is 15% of total number of athletes and among them 40% are females. Number of athletes who participated only in 400m race is 1/4 of total number of athletes and among them half are females. Number of athletes who participated in 100m and 200m race but not in 400m race is 1/10 of total number of athletes and among them 1/4 are females. Number of athletes who participated in 100m and 400 m race but not in 200 m is 7.5% of total number of athletes and among them 8/15 are females. Number of athletes who participated in all three categories is 1/20 of total number of athletes and among them 1/5 are females. Number of female athletes who participate 200m and 400 m race but not in 100m race is 8/15 of rest.

21. What is the number of female athletes who participated in exactly two categories of race?

- (a) 20 (b) 21 (c) 23 (d) 24 (e) 25

22. What is the difference between the total number of male athletes and the number of female athletes who participated in exactly one category?

- (a) 61 (b) 63 (c) 65 (d) 67 (e) 69

23. What is the ratio of the total number of athletes who participated in 200m and 400m race but not in 100m race to the male athletes among them?

- (a) 15 : 11 (b) 15 : 8 (c) 15 : 7 (d) 15 : 13 (e) 8 : 7

24. What is the number of male athletes who participated in at most two categories of race?

- (a) 104 (b) 106 (c) 108 (d) 110 (e) 112

25. The number of male athletes who participated in all three categories of race is what percentage of total number of female athletes?

- (a) 10% (b) 20% (c) 30% (d) 40% (e) None of these

Solution (21-25); Number of athletes participated only in 100 m

$$= \frac{30}{100} \times 200 = 60$$

$$\text{Female athletes participated only in 100 m} = \frac{1}{3} \times 60 = 20$$

$$\text{Male athletes participated only in 100 m} = \frac{2}{3} \times 60 = 40$$

$$\text{No. of athletes participated only in 200 m} = \frac{15}{100} \times 200 = 30$$

$$\text{Female athletes participated only in 200 m} = \frac{40}{100} \times 30 = 12$$

$$\text{Male athletes participated only in 200 m} = 30 - 12 = 18$$

$$\text{Number of athletes participated only in 400 m} = \frac{1}{4} \times 200 = 50$$

$$\text{Male athletes participated only in 400 m}$$

$$\frac{50}{2} = 25 = \text{Female athletes participated only in 400 m}$$

No. of athletes participated in 100 m and 200 m race but not in 400 m race = $\frac{1}{10} \times 200 = 20$

Female athletes participated in 100 m and 200 m race but not in 400 m race = $\frac{1}{4} \times 20 = 5$

Males athletes participated in 100 m and 200 m race but not in 400 m race = $\frac{3}{4} \times 20 = 15$

No. of athletes participated in 100 m and 400 m race but not in 200 m race = $\frac{7.5}{100} \times 200 = 15$

Females athletes participated in 100 m and 400 m race but not in 200 m race = $\frac{8}{15} \times 15 = 8$

Males athletes participated in 100 m and 400 m race but not in 200 m race = $\frac{7}{15} \times 15 = 7$

Number of athletes participated in all three categories = $\frac{1}{20} \times 200 = 10$

Female athletes participated in all three categories = $\frac{1}{5} \times 10 = 2$

Male athletes participated in all three categories = $\frac{4}{5} \times 10 = 8$

Number of female athletes participated in 200m and 400m race but not in 100 m race

= $\frac{8}{15} \times (200 - 60 - 30 - 50 - 20 - 15 - 10) = \frac{8}{15} \times (15) = 8$

Number of male athletes participated in 200m and 400m race but not in 100 m race = $\frac{7}{15} \times 15 = 7$

Race→	100m	200m	400m	100m + 200m	100m + 400m	200m + 400m	100m + 200m + 400m	Total
Male	40	18	25	15	7	7	8	120
Female	20	12	25	5	8	8	2	80

21. (b); $5+8+8=21$

22. (b); Females = $20+12+25 = 57$

Total males = 120

Difference = $120-57 = 63$

23. (c); Total = 15

Males = 7

Ratio = $15 : 7$

24. (e); $120-8 = 112$

25. (a); Total females = 80

Male (all 3 categories) = 8

Req. % = $\frac{8}{80} \times 100 = 10\%$

Directions (26-30): Study the following information carefully and answer the questions that follow:

In an organization there are a total of 1400 technical and non-technical staff members. Each of the staff members of the organization prefer tea or coffee or milk. $39\frac{2}{7}\%$ of the total number of staff members are non- technical. Out of the technical staff, the number of male members to the number of female members is in the ratio of 11 : 6.

Out of the males in the technical staff, 14% prefer only tea, 32% prefer only coffee, 28% prefer only milk, 8% prefer only tea and coffee, 8% prefer only milk and coffee, 6% prefer only tea and milk and the remaining staff prefers all the three.

Out of the females in the technical staff, 24% prefer only tea, 12% prefer only coffee, 38% prefer only milk, 6% prefer only tea and milk, 4% prefer only tea and coffee, 10% prefer only coffee and milk and the remaining staff members prefer all the three.

Out of the non-technical staff, the ratio of the number of males to the number of female is 7 : 4. Out of the males in the non-technical staff members 32% prefer tea only, 16% prefer only coffee, 24% prefer only milk, 10% prefer only tea and milk, 6% prefer only tea and coffee, 4% prefer only coffee and milk and the remaining staff member prefer all the three.

Out of the females in the non-technical staff 12% prefer only tea, 36% prefer only coffee, 34% prefer only milk, 4% prefer only tea and milk, 8% prefer only tea and coffee, 4% prefer only coffee and milk and the remaining staff member prefer all the three.

26. How many males in the technical staff prefer either tea or coffee.
 (a) 396 (b) 253 (c) 392 (d) 297 (e) 143
27. What is the ratio of the number of male members who prefer tea to the number of female member who prefer coffee?
 (a) 37 : 94 (b) 93 : 49 (c) 95 : 57 (d) 23 : 19 (e) 79 : 43
28. What is the difference between the number of males in the technical staff who prefer milk and the number of females in the non-technical staff who prefer milk?
 (a) 253 (b) 88 (c) 160 (d) 156 (e) 165
29. The number of females in non-technical staff members who prefer coffee is what percent of the number of females in the technical staff who prefer milk?
 (a) 45.33% (b) 33.33% (c) 66.66% (d) 55.55% (e) 77.77%
30. What is the ratio of the number of males in the non-technical staff who prefer only one of the three drinks to the number of females in the technical staff who prefer only one of the three drinks?
 (a) 53 : 97 (b) 43 : 19 (c) 42 : 37 (d) 72 : 35 (e) None of these

Solution (26-30)

$$\text{Non-technical staff in the organization} = \frac{275}{700} \times 1400 = 550$$

$$\text{Technical staff in the organization} = 1400 - 550 = 850$$

$$\text{Male members in technical staff} = \frac{11}{17} \times 850 = 550$$

$$\text{Female members in technical staff} = 850 - 550 = 300$$

$$\text{Male in technical staff who prefer only tea} = \frac{14}{100} \times 550 = 77$$

$$\text{Male in technical staff who prefer only coffee} = \frac{32}{100} \times 550 = 176$$

$$\text{Male in technical staff who prefer only Milk} = \frac{28}{100} \times 550 = 154$$

$$\text{Male in technical staff who prefer only tea and coffee} = \frac{8}{100} \times 550 = 44$$

$$\text{Male in technical staff who prefer only milk and coffee} = \frac{8}{100} \times 550 = 44$$

$$\text{Male in technical staff who prefer only tea \& milk} = \frac{6}{100} \times 550 = 33$$

$$\text{Male in technical staff who prefer all three} = 550 - [77 + 176 + 154 + 44 + 33 + 44] = 22$$

$$\text{Females in technical staff who prefer only tea} = \frac{24}{100} \times 300 = 72$$

$$\text{Females in technical staff who prefer only coffee} = \frac{12}{100} \times 300 = 36$$

$$\text{Females in technical staff who prefer only milk} = \frac{38}{100} \times 300 = 114$$

$$\text{Females in technical staff who prefer only tea \& milk} = \frac{6}{100} \times 300 = 18$$

$$\text{Females in technical staff who prefer only tea \& coffee} = \frac{4}{100} \times 300 = 12$$

$$\text{Females in technical staff who prefer only coffee \& milk} = \frac{10}{100} \times 300 = 30$$

$$\text{Females in technical staff who prefer all the three} = 300 - (72 + 36 + 114 + 12 + 18 + 30) = 18$$

$$\text{Males in Non-technical staff} = \frac{7}{11} \times 550 = 350$$

$$\text{Females in Non-technical staff} = \frac{4}{11} \times 550 = 200$$

$$\text{Males in non-technical staff who prefer only tea} = \frac{32}{100} \times 350 = 112$$

$$\text{Males in non-technical staff who prefer only coffee} = \frac{16}{100} \times 350 = 56$$

$$\text{Males in non-technical staff who prefer only milk} = \frac{24}{100} \times 350 = 84$$

$$\text{Males in non-technical staff who prefer only tea \& milk} = \frac{10}{100} \times 350 = 35$$

$$\text{Males in non-technical staff who prefer only tea \& coffee} = \frac{6}{100} \times 350 = 21$$

$$\text{Males in non-technical staff who prefer only coffee \& milk} = \frac{4}{100} \times 350 = 14$$

Males in non-technical staff who prefer all the three = $350 - (112 + 56 + 84 + 21 + 35 + 14) = 28$

Female in non-technical staff who prefer only tea = $\frac{12}{100} \times 200 = 24$

Female in non-technical staff who prefer only coffee = $\frac{36}{100} \times 200 = 72$

Female in non-technical staff who prefer only milk = $\frac{34}{100} \times 200 = 68$

Female in non-technical staff who prefer only milk and tea = $\frac{4}{100} \times 200 = 8$

Female in non-technical staff who prefer only tea & coffee = $\frac{8}{100} \times 200 = 16$

Female in non-technical staff who prefer only milk & coffee = $\frac{4}{100} \times 200 = 8$

Female in non-technical staff who prefer all the three = $200 - (24 + 72 + 68 + 16 + 8 + 8) = 4$

	Technical staff (850)		Non-Technical staff (550)	
Preference	Male (550)	Female (300)	Male (550)	Female (300)
Only tea	77	72	112	24
Only coffee	176	36	56	72
Only milk	154	114	84	68
Only tea & coffee	44	12	21	16
Only tea & milk	33	18	35	8
Only milk and coffee	44	30	14	8
All the three	22	18	28	4

26. (a); = $77 + 176 + 44 + 44 + 33 + 22 = 396$

27. (b); Number of male members who prefer tea = $77 + 44 + 33 + 22 + 112 + 21 + 35 + 28 = 372$

Number of female members who prefer coffee = $36 + 12 + 30 + 18 + 72 + 16 + 8 + 4 = 196$

The required ratio = $372 : 196 = 93 : 49$

28. (e); Number of male in technical who prefer milk = $154 + 44 + 33 + 22 = 253$

Number of female in non-technical who prefer milk = $68 + 8 + 8 + 4 = 88$

Difference = $253 - 88 = 165$

29. (d); Number of female in non-technical who prefer coffee = $72 + 16 + 8 + 4 = 100$

Number of female in the technical staff who prefer milk = $114 + 30 + 18 + 18 = 180$

Required percent = $\frac{100}{180} \times 100 = 55.55\%$

30. (c); Required ratio = $\frac{112+56+84}{72+36+114} = \frac{252}{222} = \frac{42}{37}$

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Practice MCQs for Prelims

Directions (1-5): study the given information carefully and answer the questions.

In a company, there are 3 companies laptop provided to its employee i.e., Dell, HP & Lenevo There are total 1000 employees. Some employees use single laptop while some uses more than it. 20 users use all 3 companies' laptop. 150 employees use more than one company's laptop. 200 employees use only Lenovo's laptop while 280 use only HP's laptop. 40% of total employees use HP's laptop & same no. of employees uses HP & Dell both & HP & Lenovo both.

- How many employees are using both Dell & Lenovo together?
(a) 20 (b) 30 (c) 50 (d) 40 (e) 10
- Employees using only Dell's laptop are what percent of employees using only Lenovo's laptop?
(a) 140% (b) 150% (c) 175% (d) 165% (e) *None of these*
- What is the ratio of employees using both Dell & Lenovo laptops together to employees using all 3 companies laptops?
(a) 3:2 (b) 2:3 (c) 3:5 (d) 5:3 (e) 5:2
- Employees using Dell are what percent more than employees using Lenovo?
(a) 40% (b) 85% (c) 33.33% (d) 12.5% (e) 56.67%
- How many employees uses only one company's laptop?
(a) 860 (b) 870 (c) 850 (d) 830 (e) 84

Directions (6-10): Study the given passage carefully and answer the questions.

In an office, there are 200 employees who consume any product (Espresso, Cappuccino, and Latte) of Nescafe. 25 employees consume espresso & latte both while 15 consume espresso & cappuccino both. 35 consume only latte. 95 employees consume espresso. 30 consume all 3 drinks. 100 employees consume exactly one drink.

- How many employees do drink exactly 2 drinks?
(a) 75 (b) 100 (c) 70 (d) 80 (e) 65
- Employees consuming cappuccino are approximately what percent of employees consuming latte?
(a) 92% (b) 98% (c) 94% (d) 96% (e) 99%
- What is the ratio of employees consuming only espresso to employees consuming cappuccino & latte both?
(a) 5:6 (b) 5:8 (c) 3:4 (d) 6:5 (e) 8:5
- What is the total no. of employees that consumes more than one drink?
(a) 90 (b) 110 (c) 80 (d) 95 (e) 100
- Average no. of employees consuming only espresso & only latte are how much more/less than average no. of employees consuming cappuccino & latte both and all 3 drinks?
(a) 2.5 (b) 0 (c) 5 (d) 7.5 (e) 10

Direction (11-15): Read the following data carefully and answer the following question.

There are 210 persons in a party, and all of them eat different flavoured icecreams. 40 people eat only butterscotch, 30 people eat all three flavoured icecream, there are total 130 people who eat butterscotch and 100 people who eat vanilla. 40 people eat butterscotch and vanilla only, 10 people eat chocolate and vanilla only.

- What is number of person who eat only Chocolate?
(a) 50 (b) 40 (c) 30 (d) 60 (e) 70
- People eating chocolate and butterscotch only are what percent of people eating only butterscotch?
(a) 50% (b) 60% (c) 25% (d) 30% (e) 40%
- Number of people eating only vanilla is how much less than the people eating all three types of icecream?
(a) 15 (b) 20 (c) 30 (d) 10 (e) 25
- People eating chocolate are what percent of people eating vanilla icecream?
(a) 100% (b) 130% (c) 110% (d) 120% (e) 90%
- What is the ratio of people eating only chocolate and only butterscotch together to the person eating only vanilla?
(a) 2:9 (b) 9:2 (c) 3:7 (d) 7:3 (e) 5:3

Directions (16-20): Study the information given below carefully and answer the questions.

In a college, there are only 2 courses offered i.e. Dentistry & Medicine. A student can enroll in any one course. In Dentistry, 250 students know Hindi while 50 knows both Hindi & English which is half of that of in medicine. 50% of students enrolled in medicines know Hindi. Students in medicine are 50% more than students in Dentistry. Total students who know only English in the college are 450.

16. What is the ratio of students who know only Hindi in Dentistry to that of in Medicine?
 (a) 1:2 (b) 5:6 (c) 1:1 (d) 3:4 (e) 2:3
17. What is the average number of students studying in Dentistry & Medicine who know both the languages?
 (a) 150 (b) 75 (c) 100 (d) 50 (e) 125
18. Students in Medicine knowing only English is what percent more than students knowing only Hindi in Dentistry?
 (a) 25% (b) 125% (c) 75% (d) 100% (e) 50%
19. What is the ratio of students knowing only Hindi in Dentistry to total number of students knowing only Hindi in Medicine and only English in Medicine?
 (a) 5:6 (b) 1:2 (c) 2:3 (d) 2:5 (e) 5:8
20. How many students have enrolled for the courses in the college?
 (a) 1000 (b) 600 (c) 800 (d) 1200 (e) 900

Direction (21-25): Study the given passage carefully & answer the questions.

In a sport Academy 'XY', there are some students who can play three games i.e. tennis, cricket & chess. Total number of players who play tennis is 160 & all three games are played by 10% of total tennis players. Ratio of cricket to chess players is 3:5 and total of cricket & chess players is 100% more than tennis players. Players who play both tennis and chess are $12\frac{1}{2}\%$ of total tennis players. Ratio of players who play both tennis & cricket to players who play both chess & cricket is 2:3 & total of players who play both tennis & cricket and players who play both chess & cricket is equal to one-fourth of chess players.

21. What is the average no. of players who play only one game?
 (a) $139\frac{2}{3}$ (b) $129\frac{1}{3}$ (c) 135 (d) None of these (e) $129\frac{2}{3}$
22. Players who play chess but not cricket is approximately what percent of total players?
 (a) 35% (b) 45% (c) None of these (d) 40% (e) 50%
23. What is ratio of players who play both tennis & chess to players who play only cricket?
 (a) 7 : 13 (b) 9 : 41 (c) 10 : 43 (d) None of these (e) 2 : 5
24. Players who play at least two games is approximately what percent of players who play utmost two games?
 (a) 4% (b) 6% (c) 15% (d) 12% (e) 9%
25. What is the difference between no. of players who can play tennis & players who play only cricket?
 (a) 74 (b) 64 (c) 68 (d) None of these (e) 72

Direction (26-30):- In an exhibition of bikes there were three companies HONDA, PULSAR and HERO who introduced their models in the exhibition and it is found at the last of the exhibition that total 300 customers have visited exhibition. 50% customers purchased HONDA; 55% customers purchased HERO; 45% customers purchased PULSAR. 20% of customers who purchased HONDA also purchased other two brands. Customers who purchased any of two brands are 95. Customers of only HONDA are 20 more than that of only PULSAR. Customers who purchased only HONDA and PULSAR are 40.

26. How many of them did not purchase any of the three bikes?
 (a) 15 (b) 20 (c) 05 (d) 10 (e) None of these
27. How many of them purchased only one company bikes?
 (a) 175 (b) 160 (c) 165 (d) 170 (e) None of these
28. How many of them purchased at least two companies bikes?
 (a) 125 (b) 105 (c) 95 (d) 130 (e) None of these

29. How many of them didn't purchase only PULSAR bike?

- (a) 160 (b) 105 (c) 260 (d) 265 (e) None of these

30. What is the total number of bikes which have been sold?

- (a) 450 (b) 445 (c) 455 (d) 305 (e) None of these

Directions (31-35): In a school total 450 students are present. Ratio of girls to boys in the school is 8:7. 50% of girls and 40% of boys play basketball. 30% of boys and 30% of girls play cricket. 20% of girls and 30% of boys play football. 21 boys and 27 girls play both cricket and basketball. 18 boys and 21 girls play both cricket and football. 15 boys and 24 girls play both basketball and football. 6 boys and 9 girls play all three games.

NOTE:- Only three games are played in the school and some students dose not play any game.

31. What is the percentage of the students that does not play any games?

- (a) $14\frac{2}{3}\%$ (b) $26\frac{8}{9}\%$ (c) $24\frac{2}{3}\%$ (d) $26\frac{2}{3}\%$ (e) $24\frac{2}{5}\%$

32. What is the ratio of boys to girls who play only basketball?

- (a) 13:9 (b) 13:11 (c) 9:13 (d) 9:8 (e) 12:11

33. Girls who play only cricket are what percent of the girls who play football?

- (a) 72% (b) 62.25% (c) 66.50% (d) 68.75% (e) none of these

34. Number of boys who does not play any games are how much less than that of girls?

- (a) 15 (b) 14 (c) 29 (d) 20 (e) 12

35. What is the ratio of the girls who play basketball to boys who play cricket?

- (a) 21:40 (b) 20:21 (c) 40:19 (d) 40:23 (e) 40 : 21

Practice MCQs for Prelims_ (Solutions)

Sol (1-5):

Employees using exactly 2 laptops = $150 - 20 = 130$

Employees using HP = $\frac{40}{100} \times 1000 = 400$

Employees using only HP & Dell = Employees using only HP & Lenovo = $\frac{[400 - (280 + 20)]}{2} = 50$

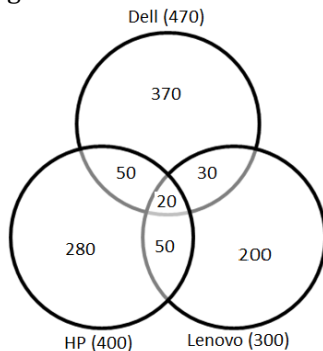
Employees using only Dell & Lenovo = $150 - (20 + 50 + 50) = 30$

Employees using HP = $280 + 50 + 50 + 20 = 400$

Employees using Lenovo = $200 + 50 + 30 + 20 = 300$

Employees using only Dell = $1000 - (50 + 280 + 50 + 20 + 30 + 200) = 370$

Employees using Dell = $370 + 50 + 20 + 30 = 470$



1. (b): employees using only Dell & Lenovo = 30

2. (e): required % = $\frac{370}{200} \times 100 = 185\%$

3. (a): required ratio = $30:20 = 3:2$

4. (e): required % = $\frac{470 - 300}{300} \times 100 = 56.67\%$

5. (c): employees using only 1 laptop = $370 + 280 + 200 = 850$

Sol. (6-10):

Employees who consume only espresso = $95 - (15 + 30 + 25) = 25$

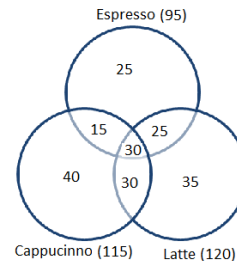
Employees who consume only cappuccino = $100 - (25 + 35) = 40$

Employees who consume only latte = $120 - (30 + 35) = 55$

Employees who consume latte & cappuccino both = $200 - (25 + 15 + 40 + 25 + 30 + 35) = 30$

Employees who consume espresso & latte both = $200 - (25 + 15 + 40 + 25 + 30 + 35) = 30$

Employees who consume espresso & cappuccino both = $200 - (25 + 15 + 40 + 25 + 30 + 35) = 30$



6. (c): employees who drink exactly 2 drinks = $15 + 25 + 30 = 70$

7. (d): Employees who consume cappuccino = $40 + 30 + 30 = 100$

Employees who consume latte = $30 + 30 + 25 + 35 = 120$

Required % = $\frac{115}{120} \times 100 = 95.83\% \approx 96\%$

8. (a): required ratio = $25:30 = 5:6$

9. (e): required number of employee = $15 + 30 + 25 + 30 = 100$

10. (b): required answer = $\frac{25+35}{2} - \frac{30+30}{2} = 0$

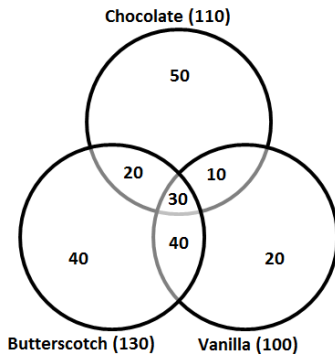
Sol. (11-15):

Person who eat only vanilla = $100 - (40+10+30) = 20$

Person who eat butterscotch and chocolate only = $130 - (40+40+30) = 20$

Person who eat only chocolate = $210 - (40+40+30+10+20+20) = 50$

Person who eat chocolate = $50+20+30+10 = 110$



11. (a): Number of people who eat only chocolate = 50

12. (a): A.T.Q

People eating chocolate and butterscotch only = 20

People eating only butterscotch = 40

∴ required percentage = $\frac{20}{40} \times 100 = 50\%$

13. (d): people eating only vanilla = 20

People eating all 3 icecreams = 30

Required difference = $30 - 20 = 10$

14. (c): people eating chocolate = 110

People eating vanilla = 100

∴ required percentage = $\frac{110}{100} \times 100 = 110\%$

15. (b): people eating only chocolate and only butterscotch together = $50+40 = 90$

People eating only vanilla = 20

∴ required ratio = 9:2

Sol. (16-20):

Students who know both languages in Dentistry = 50

Students who know both languages in Medicine = $50 \times 2 = 100$

Students who know only Hindi in Dentistry = $250 - 50 = 200$

Let students in Dentistry = $4x$

So, students in Medicine = $6x$

Students who know only Hindi in Medicine = $3x - 100$

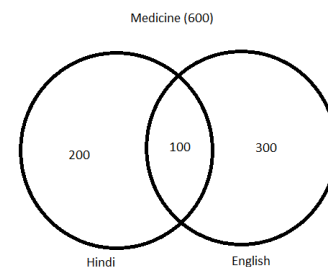
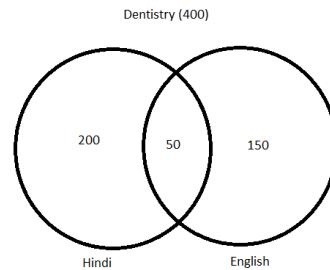
Students who know only English in Dentistry = $4x - (50 + 200) = 4x - 250$

Students who know only English in Medicine = $6x - (3x - 100 + 100) = 3x$

Total students who know only English in Medicine & Dentistry together = 450

ATQ,

$450 = 4x - 250 + 3x \Rightarrow x = 100$



16. (c): Required ratio = $\frac{200}{200} = 1:1$

17. (b): Required average = $\frac{50+100}{2} = 75$

18. (e): Required % = $\frac{300-200}{200} \times 100 = 50\%$

19. (d): Required ratio = $\frac{200}{500} = 2:5$

20. (a): Total students in college = $400 + 600 = 1000$

Sol. (21-25):

Players who play tennis = 160

Players who play all three games = $160 \times \frac{10}{100} = 16$

Let players who play cricket & chess be $3x$ & $5x$ respectively.

ATQ,

$8x = 160 \times 2 = 320$

$x = 40$

∴ Cricket players = 120

And chess players = 200

Players who play both tennis and chess = $\frac{1}{8} \times 160 = 20$

Let players who play both tennis and cricket and players who play both chess and cricket be $2y$ & $3y$ respectively.

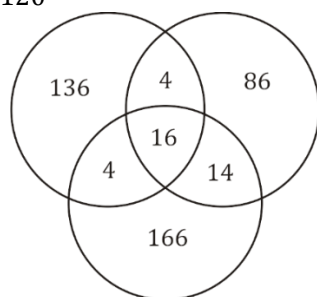
ATQ,

$5y = 50 \Rightarrow y = 10$

Total no. of players = $136 + 166 + 86 + 4 + 4 + 14 + 16 = 426$

Tennis=160

cricket=120



Chess = 200

$$21. (b): \text{Required average} = \frac{136+166+86}{3} = \frac{388}{3} = 129\frac{1}{3}$$

$$22. (d): \text{Required percentage} = \frac{170}{426} \times 100 \approx 40\%$$

$$23. (c): \text{Required ratio} = \frac{20}{86} = 10:86$$

$$24. (e): \text{Required percentage} = \frac{(4+4+16+14)}{426-16} \times 100 = \frac{3800}{410} = 9\%$$

$$25. (a): \text{Required difference} = 160-86 = 74$$

Solutions (26-30):

$$\text{Total customer purchased HONDA} = \frac{50}{100} \times 300 = 150$$

$$\text{Total purchased HERO} = \frac{55}{100} \times 300 = 165$$

$$\text{Total purchased PULSAR} = \frac{45}{100} \times 300 = 135$$

$$\text{Customer purchased all three companies bikes} = \frac{20 \times 150}{100} = 30$$

Purchased HONDA and PULSAR = 40

Two bikes purchased by customers $\Rightarrow 95$

Let only Pulsar purchased by customer = x

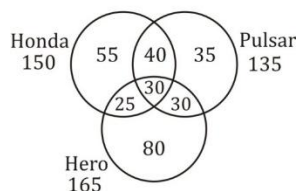
So only HONDA = x + 20

Now,

Total, only Pulsar and only Honda purchased by

$$x + x + 20 = 150 + 135 - 100 - 95 = 90$$

$$x = 35$$



$$26. (c): 300 - 295 = 05$$

$$27. (d): = 55 + 35 + 80 = 170$$

$$28. (a): \text{At least 2 bikes} = 25 + 30 + 30 + 40 = 125$$

$$29. (d): \text{Required number} = 300 - 35 = 265$$

$$30. (a): \text{Total bikes sold} = (55 + 35 + 80) \times 1 + (25 + 30 + 40) \times 2 + 30 \times 3 = 170 + 190 + 90 = 450$$

Solution (31-35)

Total students $\rightarrow 450$

$$\text{Total boys} \rightarrow \frac{7}{15} \times 450 = 210$$

$$\text{Total girls} \rightarrow \frac{8}{15} \times 450 = 240$$

In basketball

$$\text{Boys} \rightarrow \frac{40 \times 210}{100} = 84$$

$$\text{Girls} \rightarrow \frac{50 \times 240}{100} = 120$$

In Cricket

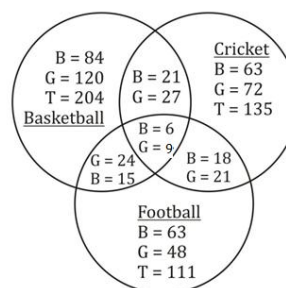
$$\text{boys} \rightarrow \frac{30 \times 210}{100} = 63$$

$$\text{Girls} \rightarrow \frac{30 \times 240}{100} = 72$$

In football

$$\text{boys} \rightarrow \frac{30 \times 210}{100} = 63$$

$$\text{Girls} \rightarrow \frac{20 \times 240}{100} = 48$$



Now,

Student does not play any games

$$= 450 - (204 + 135 + 111 - 48 - 39 - 39 + 15) = 111$$

$$31. (c): \text{Required Percentage} = \frac{111}{450} \times 100 = 24\frac{2}{3}\%$$

$$32. (c): \text{Girls who play only basketball} = 120 - (27 + 24) + 9 = 78$$

$$\text{boys who play only basketball} = 84 - (21 + 15) + 6 = 54$$

$$\text{Ratio} = \frac{54}{78} = \frac{9}{13}$$

$$33. (d): \text{Girls play only cricket} = 72 - (21 + 27) + 9 = 33$$

$$\text{Required \%} = \frac{33}{48} \times 100 = 68.75\%$$

$$34. (a): \text{Number of boys who does not play any games} = 210 - (84 + 63 + 63 - 21 - 18 - 15 + 6) = 48$$

$$\text{Number of girls who does not play any games} = 240 - (120 + 72 + 48 - 27 - 21 - 24 + 9) = 63$$

$$\text{Difference} = 63 - 48 = 15$$

$$35. (e): \text{Ratio} = \frac{120}{63} = \frac{40}{21} = 40:21$$

Practice MCQs for Mains

Directions (1-5): Study the given information carefully and answer the questions carefully.

A box of chocolate having some chocolate balls is to be equally distributed among Ajay, Akshay, Rani & Diya. Ajay opened the box as he was eldest. Ajay took his share from it and put the remaining in box. Akshay took remaining and divided into 4 equal parts and took his & gave a part to Ajay. From remaining, Rani again divided in 4 equal parts and shared parts each with Ajay, Akshay and herself. Finally, Diya divided the remaining in 4 equal parts and gave everyone equal share. This way, Rani ate 12 chocolates more than Diya.

- How many chocolate balls are received by Akshay?
(a) 3 (b) 15 (c) 71 (d) 39 (e) 40
- Chocolate balls received by Rani are what percent less than that by Ajay? (approx)
(a) 79% (b) 82% (c) 81% (d) 75% (e) 77%
- If Ajay has to share his total share equally among all (including himself) in such that each received only integer value of balls. How many chocolate balls will Ajay have now?
(a) 17 (b) 21 (c) 20
(d) None of these (e) Cannot be determined
- What is the ratio of chocolate balls received by Akshay to Rani?
(a) 5:13 (b) 13:5 (c) 8:3 (d) None of these (e) 20:7
- If Ajay & Akshay would have opened box together and take equal parts then the remaining was divided by Rani & Diya as per the process mentioned above. How many more chocolate balls had Rani received than Diya?
(a) 32 (b) 12 (c) 16
(d) None of these (e) Cannot be determined

Direction (6 – 8): Given below data gives information of people of 'Gita colony' who subscribed one or more of three news channels i.e. AAJ TAK, NDTV and INDIA NEWS. Read the data carefully and answer the questions. In 'Gita colony' people subscribed only these 3 channels.

276 people subscribed AAJ TAK, 264 people subscribed NDTV & 236 people subscribed INDIA NEWS. 132 people subscribed both AAJ TAK & NDTV, 128 people subscribed both NDTV & INDIA NEWS, while 92 people subscribed both AAJ TAK & INDIA NEWS. The sum of square of people who subscribed only NDTV and those who subscribed only INDIA NEWS is 140 more than square of 30.

- Find number of people who subscribed at least two news channels ?
(a) 308 (b) 318 (c) 328 (d) 324 (e) 332
- Find total number of people who subscribed news channel in 'Gita colony'.
(a) 436 (b) 446 (c) 484 (d) 776 (e) 724
- Find ratio of people subscribed all the news channels to total people subscribed only INDIA NEWS?
(a) 3 : 8 (b) 3 : 4 (c) 2 : 5 (d) 3 : 5 (e) 3 : 7

Directions (9-13): Study the passage given below carefully and answer the following questions.

In Azad Public School, students have to select at least one subject from Hindi, English and Math. Ratio of total number of students who choose Hindi, English and Math is 5 : 8 : 7 respectively. Ratio of number of students who choose both Hindi and English to students who choose both Math and English to students who choose both Hindi and Math is 5 : 6 : 4. Ratio of number of students who choose only Hindi to students who choose only English is 2 : 5. Number of students who choose only Math are 130. Number of students who choose all three subjects are 80. Number of students who choose only Hindi are 40% of number of students who choose both Hindi and English.

- Find number of students who have chosen at most 2 subjects.
(a) 370 (b) 550 (c) 720 (d) 640 (e) 700
- Find the number of students who have chosen at least 1 more subject along with English.
(a) 160 (b) 250 (c) 340 (d) 210 (e) 280

11. Number of students who have chosen Hindi are how much more or less than number of students who have chosen Math?
 (a) 130 (b) 80 (c) 150 (d) 50 (e) 100
12. Number of students who have chosen both Hindi and English but not Math is what percent of total number of students who have chosen Math?
 (a) 90% (b) 20% (c) 50% (d) 10% (e) 70%
13. Find the total number of students in the school.
 (a) 1000 (b) 850 (c) 740 (d) 590 (e) 630

Direction (14–18): Read the given information carefully and answer the following questions.

In a school there are 360 students and all the students play either out door games or indoor games or both games together. Boys are 25% more than the number of girls. The number of students playing only indoor games is equal to the students playing only outdoor games. The number of girls playing only outdoor games is equal to the girls playing both the games together. Number of boys playing both the games together is $\frac{1}{3}$ rd of the boys playing only out door games. Number of boys playing only indoor games is 160% of the girls playing only outdoor games.

14. Find the total number of students playing only one game?
 (a) 260 (b) 280 (c) 275 (d) 240 (e) 300
15. Difference of boys & girls playing only indoor games is what percent of the difference of boys & girls playing both the games together?
 (a) 100% (b) 75% (c) 50% (d) 120% (e) 150%
16. If 40 students got admission in the school and they all play outdoor games only, then number of students playing only indoor game is what percent of total number of students in the school?
 (a) 20% (b) 25% (c) 50% (d) 35% (e) 40%
17. Find the percentage of students who are playing both the games together out of total students in school?
 (a) $25\frac{4}{9}\%$ (b) $22\frac{2}{9}\%$ (c) $29\frac{4}{9}\%$ (d) $30\frac{2}{9}\%$ (e) None of these
18. Find ratio of number of boys playing only one game to the number of girls in the school?
 (a) 17 : 16 (b) 16 : 15 (c) 4 : 3 (d) 6 : 5 (e) 3 : 2

Direction (19-23): Read the data carefully and answer the questions.

In a coaching institute, the ratio of students taking classes for SSC and Railway exam is 3:4. The number of students taking classes only for SSC is 100 more than twice the number of students taking classes only for Banking and 300% more than the number of students taking classes for all these exams together. The number of students taking classes for only SSC & Banking together and for only SSC & Railway together is equal and is 25% more than number of students taking classes for all the three exams together. Number of students taking classes only for Banking and Railway exam together is $33\frac{1}{3}\%$ of students taking classes only for Banking exam. The number of students taking classes for Banking exam is 45% of the students taking classes for Railway exam.

19. Find the total number of students in the Coaching Institute?
 (a) 2680 (b) 2710 (c) 2940 (d) 2830 (e) 2870
20. Total number of students who are taking classes of only two exams together are how much more or less than students taking classes of only SSC exam?
 (a) 120 (b) 125 (c) 130 (d) 140 (e) 150
21. Total number of students who are taking Banking classes but not SSC classes are what percent of number of students taking classes for SSC exam?
 (a) 20% (b) 30% (c) 25% (d) $27\frac{1}{2}\%$ (e) $33\frac{1}{3}\%$
22. Find difference between number of students taking only one classes and the students taking classes of Railway exam?
 (a) 460 (b) 450 (c) 440 (d) 480 (e) 490
23. Students taking classes of all the three exams together is what percent less than students taking classes of Banking exam?
 (a) $55\frac{5}{9}\%$ (b) $66\frac{2}{3}\%$ (c) $77\frac{7}{9}\%$ (d) $88\frac{8}{9}\%$ (e) 90%

Directions (24-27): Read the given information carefully and answer the following questions.

According to a survey conducted among newspaper readers of city X, the number of people reading TOI, Indian Express and Hindu newspapers are 800, 1000 and 900 respectively. The number of people reading both TOI and Hindu together is 20% more than the number of people reading both Indian Express and Hindu together. Also, the number of people reading only Indian Express is twice the number of people reading only TOI. There are 250 people reading only Hindu. The number of people reading only TOI and Hindu together is half the number of people reading exactly two newspapers.

24. Probability of total number of people reading only one newspaper is what percent of the probability of total number of people reading exactly two newspapers?

- (a) None of these (b) $195\frac{5}{11}\%$ (c) $198\frac{2}{11}\%$ (d) $196\frac{4}{11}\%$ (e) $194\frac{6}{11}\%$

25. How many people read at least two newspapers?

- (a) 725 (b) 675 (c) 650 (d) 750 (e) 755

26. The number of people reading only Indian Express is what percentage more or less than the people reading Indian Express and Hindu together?

- (a) $48\frac{1}{3}\%$ (b) $43\frac{1}{3}\%$ (c) $46\frac{2}{3}\%$ (d) $51\frac{2}{3}\%$ (e) $53\frac{1}{3}\%$

27. If a person reading TOI is chosen randomly, then what is the probability that the person reads Indian Express and Hindu as well?

- (a) $\frac{5}{32}$ (b) $\frac{7}{36}$ (c) $\frac{8}{35}$ (d) $\frac{9}{40}$ (e) $\frac{7}{32}$

Directions (28-32): Read the given information carefully and answer the following questions.

Among 480 students, each student has to choose one or more out of 3 subjects namely Java Programming (JP), Database Management (DM), Artificial Intelligence (AI).

Sum of the number of students who choose exactly one subject and that of those who choose exactly three subjects is 200% more than number of students who choose exactly 2 out of the 3 subjects. The number of students who choose both DM and AI but not JP is 16 more than that of those who choose both JP and DM but not AI. The number of students who choose all the three subjects is at least 15.

Number of students who choose only DM is more than that of those who choose only JP. The number of students who choose both JP and DM but not AI is at least one-fifth and at most one-third that of those who choose exactly two subjects. The number of students who choose JP is 4 less than that of those who choose AI. The number of students who choose only AI is 6 times that of those who choose all the three subjects.

28. What will be the possible difference between number of students who choose only DM and only AI?

- I. 52 II. 63 III. 44 IV. 49 V. 33 VI. 25
(a) All of these (b) Only I, III and V (c) Only II, III and VI (d) Only III, IV and V (e) Only I, IV and VI

29. Quantity I: Maximum possible difference between number of students who choose only JP and only DM?

Quantity II: 50% of the number of students who choose exactly two subjects.

- (a) Quantity I > Quantity II (b) Quantity II > Quantity I
(c) Quantity I >= Quantity II (d) Quantity II >= Quantity I
(e) Quantity I = Quantity II or relation can't be established.

30. What will be the average of all possible value of number of students who choose exactly one subjects?

- (a) 344 (b) 340 (c) 350 (d) 348 (e) 346

31. What was the minimum number of students who chose AI and exactly one out of JP and DM?

- (a) 72 (b) 75 (c) 78 (d) 80 (e) 82

32. What was the maximum number of students who chose JP?

- (a) 221 (b) 218 (c) 215 (d) 208 (e) 211

Directions (33-35): Read the given information carefully and answer the following questions.

In a batch of 400 students, 80 students passed only in Chemistry, 90 students passed in both Physics and Maths together, 100 students passed in both Maths and Chemistry together, 150 students passed in Physics and 70 students failed in all the three subjects.

33. Find the number of students who failed in Physics?
 (a) 200 (b) 150 (c) 100 (d) 50 (e) 180
34. What is the maximum number of students who passed in chemistry?
 (a) 200 (b) 275 (c) 260 (d) 250 (e) 240
35. If the number of students who failed in both Maths and Chemistry was equal to number of students who passed in all the three subjects together, then which of the following could not be a possible value of the number of students who passed in all the three subjects?
 I. 68 II. 70 III. 75 IV. 65 V. 60
 (a) Both I and II (b) Both IV and V (c) Both I and III (d) I, IV and V (e) II, III and IV

Practice MCQs for Mains_(Solutions)

Sol (1-5):

Let total chocolate balls be $256x$.

$$\text{Ajay took} = \frac{256x}{4} = 64x$$

$$\text{Remaining} = 256x - 64x = 192x$$

Akshay divided remaining in 4 equal parts

$$\text{Ajay \& Akshay received} = \frac{192x}{4} = 48x \text{ (each)}$$

$$\text{Remaining} = 192x - (48x + 48x) = 96x$$

Rani divided remaining in 4 equal parts

$$\text{Ajay, Akshay \& Rani received} = \frac{96x}{4} = 24x \text{ (each)}$$

$$\text{Remaining} = 96x - (24x + 24x + 24x) = 24x$$

Diya divided remaining in 4 equal parts

$$\text{Each received} = \frac{24x}{4} = 6x$$

Total chocolate balls received

$$\text{Ajay} = 64x + 48x + 24x + 6x = 142x$$

$$\text{Akshay} = 48x + 24x + 6x = 78x$$

$$\text{Rani} = 24x + 6x = 30x$$

$$\text{Diya} = 6x$$

$$\text{ATQ, Rani} = \text{Diya} + 12$$

$$30x = 6x + 12 \Rightarrow x = 0.5$$

$$\text{Total chocolate balls} = 256 \times 0.5 = 128$$

$$\text{Ajay} = 142 \times 0.5 = 71; \text{Akshay} = 78 \times 0.5$$

$$= 39; \text{Rani} = 30 \times 0.5 = 15; \text{Diya} = 6 \times 0.5 = 3$$

1. (d): Chocolate balls received by Akshay = 39

2. (a): chocolate balls received by Rani = 15

Chocolate balls received by Ajay = 71

$$\text{Required \%} = \frac{71-15}{71} \times 100 = 78.87\% \approx 79\%$$

3. (c): Ajay has 71 chocolate balls

This is to divided among 4 in equal proportion

Nearest multiple of 4 is 68 as each has got integer value of balls

$$\text{Ajay left with} = \frac{68}{4} + 3 = 20$$

4. (b): chocolate balls received by Akshay = 39

Chocolate balls received by Rani = 15

$$\text{Required ratio} = \frac{39}{15} = 13:5$$

5. (e): Ajay & Akshay each received $= \frac{256x}{4} = 64x$

$$\text{Remaining} = 256x - (64x + 64x) = 128x$$

Rani divided in 4 equal parts

$$\text{Ajay, Akshay \& Rani each received} = \frac{128x}{4} = 32x$$

$$\text{Remaining} = 128x - (32x + 32x + 32x) = 32x$$

Diya divided in 4 equal parts

$$\text{Each received} = \frac{32x}{4} = 8x$$

Total chocolate balls received

$$\text{Ajay} = 64x + 32x + 8x = 104x$$

$$\text{akshay} = 64x + 32x + 8x = 104x$$

$$\text{rani} = 32x + 8x = 40x; \text{diya} = 8x$$

Since, we don't know value of x. exact value cannot be determined.

Sol (6 - 8):

Let number of people subscribed all three news channels = a

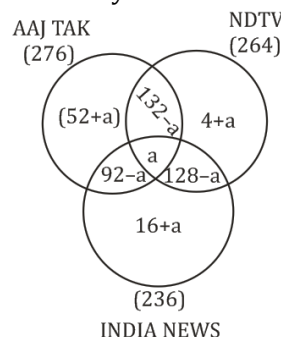
Number of people who subscribed both AAJ TAK & NDTV but not INDIA NEWS = $132 - a$

Number of people who subscribed both NDTV & INDIA NEWS but AAJ TAK = $128 - a$

Number of people who subscribed both AAJ TAK & INDIA NEWS but not NDTV = $92 - a$

Number of people who subscribed only AAJ TAK = $276 - 132 - (92 - a) = (52 + a)$

Similarly, we can find Number of people who subscribed only NDTV & Only INDIA TV

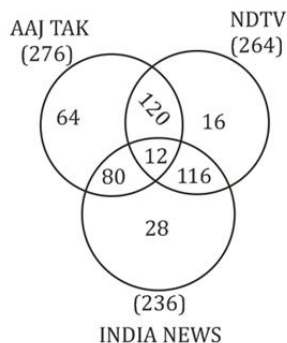


$$\text{Also given, } (4 + a)^2 + (16 + a)^2 = (30)^2 + 140$$

$$16 + a^2 + 8a + 256 + a^2 + 32a = 1040$$

$$a^2 + 20a - 384 = 0$$

$$a = 12$$



6. (c): Required sum = $(120 + 116 + 80 + 12) = 328$

7. (a): Required sum = $276 + 16 + 116 + 28 = 436$

8. (e): Required ratio = $12 : 28 = 3 : 7$

Sol (9-13):

Let total number of students who choose Hindi, English and Math be $50x$, $80x$ & $70x$ respectively.

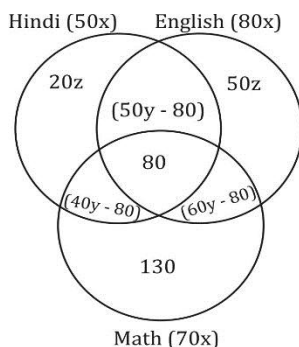
Now, let number of students who choose both Hindi and English, students who choose both Math and English & students who choose both Hindi and Math be $50y$, $60y$ & $40y$ respectively.

So, number of students who choose both Hindi and English but not Math = $(50y - 80)$

Number of students who choose both Math and English but not Hindi = $(60y - 80)$

And, number of students who choose both Hindi and Math but not English = $(40y - 80)$

Now, let number of students who choose only Hindi and students who choose only English be $20z$ & $50z$ respectively.



ATQ,

$$\frac{20z}{50y} = \frac{40}{100}$$

$$y : z = 1 : 1$$

Now, let each of y & z be a .

$$50x = 20z + 80 + 40y - 80 + 50y - 80$$

$$50x = 20z - 80 + 90y \quad \dots(i)$$

Put value of y & z in (i):

$$50x = 20a - 80 + 90a$$

$$x = \frac{11a-8}{5} \quad \dots(ii)$$

$$\text{Now, } 70x = 130 + 80 + 40y - 80 + 60y - 80$$

$$70x = 100y + 50 \quad \dots(iii)$$

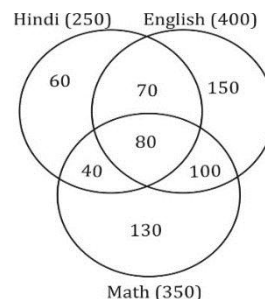
Put value of y & z in (iii):

$$70x = 100a + 50$$

$$x = \frac{10a+5}{7} \quad \dots(iv)$$

On solving (ii) & (iv), we get:

$$a = 3, x = 5$$



9. (b): Required number of students

$$= (60 + 70 + 150 + 40 + 100 + 130) = 550$$

10. (b): Required number of students

$$= 70 + 80 + 100 = 250$$

11. (e): Required difference = $350 - 250 = 100$

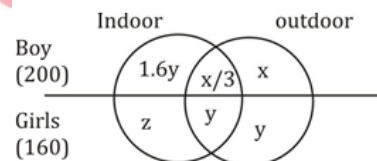
$$12. (b): \text{Required } \% = \frac{70}{350} \times 100 = 20\%$$

$$13. (e): \text{Required number of students} = 60 + 70 + 150 + 40 + 80 + 100 + 130 = 630$$

Sol (14-18):

$$\text{Number of boys in the school} = \frac{360}{225} \times 125 = 200$$

$$\text{Number of girls in the School} = 160$$



Let number of boys playing outdoor games only be x and the girls playing only outdoor games be y .

Let the number of girls playing only indoor games be z .

ATQ,

$$1.6y + z = x + y$$

$$\Rightarrow x - z = 0.6y \quad \dots (i)$$

Also

$$1.6y + \frac{x}{3} + x = 200$$

$$\Rightarrow 4.8y + 4x = 600$$

$$\Rightarrow 1.2y + x = 150 \quad \dots (ii)$$

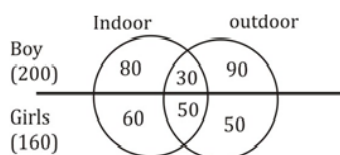
And,

$$(x - 0.6y) + 2y = 160$$

$$\Rightarrow x + 1.4y = 160 \quad \dots (iii)$$

From (ii) & (iii), we have

$$x = 90 \text{ \& } y = 50$$



14. (b): Required total = 280

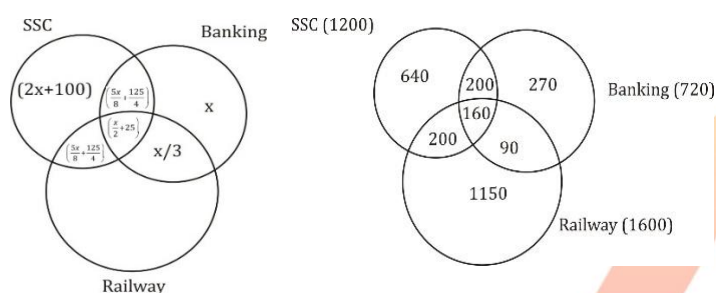
15. (a): required % = $\frac{(80-60)}{(50-30)} \times 100 = 100\%$

16. (d): required % = $\frac{140}{400} \times 100 = 35\%$

17. (b): required % = $\frac{80}{360} \times 100 = 22\frac{2}{9}\%$

18. (a): required ratio = $\frac{(80+90)}{160} = 17 : 16$

Sol (19-23):



Let the number of students taking classes for SSC and Railway exam be $3a$ and $4a$ respectively.

Number of students taking classes for Banking exam = $4a \times \frac{45}{100} = 1.8a$

Let the number of students taking classes only for Banking exam be x .

Students taking classes only for SSC exam = $(2x+100)$

Number of students taking classes for all the three exams together = $\frac{2x+100}{4} = (\frac{x}{2} + 25)$

Number of students taking classes only for Railway and Banking exam together = $\frac{x}{3}$

Number of students taking classes for only SSC & Banking exams together

$$= \frac{5}{4}(\frac{x}{2} + 25) = (\frac{5x}{8} + \frac{125}{4})$$

ATQ,

$$\frac{(2x+100)+2(\frac{5x}{8} + \frac{125}{4}) + \frac{x}{2} + 25}{(\frac{5x}{8} + \frac{125}{4}) + (\frac{x}{2} + 25) + \frac{x}{3} + x} = \frac{3a}{1.8a}$$

$$\Rightarrow \frac{\frac{30x}{8} + \frac{1500}{8} + \frac{x}{2} + 25}{\frac{59x}{24} + \frac{225}{4}} = \frac{5}{3}$$

$$\Rightarrow x = 270$$

19. (b): Required number of students = 2710.

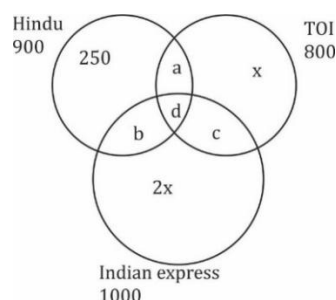
20. (e): required difference = $640 - (200+200+90) = 150$

21. (b): Required % = $\frac{(270+90)}{1200} \times 100 = 30\%$

22. (a): Required difference = $(640+270+1150) - 1600 = 460$

23. (c): Required = $\frac{(720-160)}{720} \times 100 = \frac{700}{9}\% = 77\frac{7}{9}\%$

Sol (24-27):



The number of people reading only TOI and Hindu together is half the number of people reading exactly two newspapers, so

$$\frac{a+b+c}{2} = a$$

$$b+c=a \dots \dots \dots (i)$$

The number of people reading both TOI and Hindu together is 20% more than the number of people reading both Indian Express and Hindu together, hence

$$a+d=1.2(b+d)$$

$$b+c+d=1.2b+1.2d$$

$$c=0.2b+0.2d$$

$$5c=b+d \dots \dots \dots (ii)$$

Now, as we know number of people who read only Hindu = 250

$$900 = 250 + a + b + d$$

$$650 = 2b + c + d \text{ (using (i))}$$

$$650 = b + 6c \text{ (using (ii))} \dots \dots \dots (iii)$$

Now, as we know, number of people who read TOI = 800

$$800 = x + b + 2c + d \text{ (using (i))}$$

$$x = 800 - 7c \text{ (using (ii))} \dots \dots \dots (iv)$$

Now, as we know, number of people who read Indian Express = 1000

$$1000 = 2x + c + b + d$$

$$x = \frac{1000 - 6c}{2} \text{ (using (iii))}$$

$$x = 500 - 3c \dots \dots \dots (v)$$

Now, from (iv) and (v)

$$800 - 7c = 500 - 3c$$

$$300 = 4c$$

$$c = 75$$

$$x = 800 - 525 = 275$$

$$b = 200 \text{ (using (iii))}$$

$$d = 175 \text{ (using (ii))}$$

$$a = 275 \text{ (using (i))}$$

24. (b): the total people participated in the survey

$$= a + b + c + d + x + 2x + 250$$

$$= 275 + 200 + 75 + 175 + 275 + 550 + 250 = 1800$$

Total number of people reading only one newspaper = $x + 2x + 250 = 1075$

$$\text{Probability} = \frac{1075}{1800} = \frac{43}{72}$$

Total number of people reading exactly two newspapers = $a + b + c = 275 + 200 + 75 = 550$

$$\text{probability} = \frac{550}{1800} = \frac{11}{36}$$

$$\text{required \%} = \frac{72}{11} \times 100 = \frac{2150}{11} = 195\frac{5}{11}\%$$

25. (a): Required number of people = $a + b + c + d = 725$

$$\text{26. (c): Required \%} = \frac{550 - 375}{375} \times 100 = 46\frac{2}{3}\%$$

$$\text{27. (e): Required probability} = \frac{175}{800} = \frac{7}{32}$$

Sol (28-32):

All 480 students selected at least one of these 3 subjects.

Let the no. of students who choose exactly one subject be S

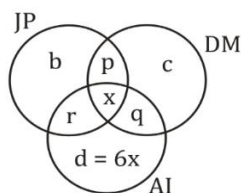
Let the no. of students who choose exactly two subjects be D

Let the no. of students who choose exactly three subjects be T

$$S + D + T = 480$$

$$3D = S + T \text{ (given)}$$

$$\Rightarrow D = 120$$



$$24 \leq p \leq 40 \text{ and } 40 \leq q \leq 56$$

We can write $p = (24 + y)$ then $q = (40 + y)$

$$\text{Now, } r = 120 - (p + q)$$

$$r = (56 - 2y)$$

ATQ

$$b + (24 + y) + (56 - 2y) + x = 6x + (56 - 2y) + (40 + y) + x - 4$$

$$b = (6x + 12)$$

Since x is at least 15, possible values of b = 102, 108, 114, 120

$$\text{Also, } c + b + d + x = 480 - 120 = 360$$

$$\Rightarrow c = (348 - 13x)$$

As, c is greater than b, possible values of c = 153, 140, 127 (x can take three values)

Hence, the possible values of d = 90, 96 & 102

x	b	c	c
15	102	153	90
16	108	140	96
17	114	127	102

28. (c): Required possible difference = 63, 44 and 25

29. (b): Quantity I: Possible difference = 51, 32 and 13

Maximum possible difference = 51

Quantity II: 60

Quantity II > Quantity I

30. (a): All possible value of number of students who choose exactly one subjects = 345, 344 and 343
So, required average = 344

31. (d): We have to minimize $(q + r) = (56 - 2y) + (40 + y) = 96 - y$

When y is max i.e. 16, we will get the min. value = 80

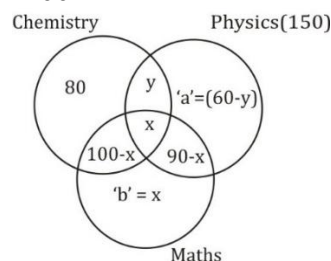
32. (e): No. of students who choose JP = $b + p + r + x = (92 - y + 7x)$

The above quantity will be maximum when y is minimum & x is max. i.e. 17

So, max students who choose JP = 211

Sol (33-35):

Total Students = 400



Let number students who passed in only physics & only maths be 'a' & 'b' respectively.

Let number of students who passed in all these subjects together be 'x' and students who passed in only in physics & chemistry together be y.

$$\text{Total passed students} = 400 - 70 = 330$$

Number of students who passed in only physics

$$\Rightarrow 150 = a + y + x + (90 - x)$$

$$\Rightarrow a = (60 - y)$$

Total passed students

$$\Rightarrow 330 = 80 + 150 + (100 - x) + b$$

$$\Rightarrow b = x.$$

33. (e): Number of students who failed in Physics = No of students passed only in Chemistry + No of students passed only on Math + no of students passed only in Chemistry and Math together
= $(100 - x) + 80 + x = 180$

34. (e): Number of students who passed in Chemistry

$$= 80 + y + (100 - x) + x = (180 + y)$$

It would be maximum when y will be maximum.

And the maximum value of y can be 60

So, there required maximum Value

$$= 180 + 60 = 240$$

35. (d): Since, number of students who failed in both Maths and Chemistry = those passing in all three

$$\Rightarrow 70 + 60 - y = x$$

$$\Rightarrow x + y = 130$$

Now since $y \leq 60$, it also means that x cannot be less than 70

Previous Years' Questions of Prelims

Directions (1-5): Study the following information given in the paragraph and answer the questions accordingly. Following information gives data regarding number of persons in a village who plays different sports i.e. Cricket, Football and Hockey. Each person plays at least one sports.

There are total 800 persons in a village who plays sports. 43 % of the total persons plays Cricket, 52.5 % of the total persons plays football and 55 % of the total persons plays Hockey. 96 persons plays both cricket and football but not Hockey. 100 persons plays both cricket and Hockey but not Football, 88 players plays both Hockey and Football but not cricket and 60 persons plays all the three sports.

1. Find the percentage of persons who plays at least two sports?
 (a) 47 % (b) 43 % (c) 10 % (d) 14 % (e) 15 %
2. Find the difference of persons who plays only football and persons who play only hockey?
 (a) 20 (b) 18 (c) 16 (d) 24 (e) 12
3. How many persons are there who plays neither football nor cricket ?
 (a) 172 (b) 144 (c) 176 (d) 192 (e) 156
4. Find the respective ratio of persons playing both cricket and football to the persons playing both football and hockey together?
 (a) 12: 11 (b) 11: 12 (c) 9: 13 (d) 8: 15 (e) 12: 13
5. Number of persons playing only football is what percent more/less than the persons playing both cricket and hockey together?
 (a) 64 % (b) 82 % (c) 80% (d) 76 % (e) 55%

Directions (6-10): Study the following information carefully and answer the following questions.

3900 students of a school have the option to choose any of the 3 games viz. Cricket, Football and Badminton. The ratio of boys and girls is 8 :5. 20% of the boys opted to play only Badminton. 750 boys opted to play only Cricket. Girls who opted to play only football are 30% of total girls. Girls who opted to play only badminton are 320. One-fifth of the total girls opted for only cricket. Girls play only cricket and badminton together are 5% of total boys. 150 boys opted to play only cricket and football together. Total no. of students who play all the game together are 350. Boys opted to play only football are 60% of the boys who play only cricket. One-tenth of the total boys play all the three games together. 220 boys opted to play only football and badminton together. Girls who opted to play only cricket & football together are equal to girls who play only badminton & football together.

6. Which of the following game is opted by same no. of girls and boys?
 (a) Only football (b) Only cricket (c) Only badminton (d) All the game together (e) Only cricket and badminton together
7. No. of boys who plays only football are what percent of no. of girls who plays only cricket?
 (a) 80% (b) 120% (c) 150% (d) 120% (e) 100%
8. Find the difference between the students who opted for only cricket & badminton together and no. of students who opted to play all the games.
 (a) 120 (b) 220 (c) 160 (d) 150 (e) 90
9. What is the average no. of boys who opted to play only cricket, only badminton and only Football?
 (a) 480 (b) 650 (c) 740 (d) 560 (e) 720
10. What is the ratio between no. of boys who opted to play cricket to that of no. of girls who opted to play badminton?
 (a) 24/13 (b) 12/25 (c) 20/13 (d) 23/15 (e) 25/13

Directions (11-15): Study the passage given below and answer the following questions.

In a school, there are 330 students. Each student studies at least one subject amongst English, Math and Science. Students studying only Math and English together are 25% of students studying only English. Students studying Science are equal to students studying only Math. Students studying only Science are 175% of students studying only English. Students studying all three subjects together are equal to students studying only Math and English together. Students studying Science and English together are equal to students studying only English. Students studying only Math and Science together are equal to students studying only English and Science together and students studying only Math are 140.

11. Find average number of students studying only English and only Science.
 (a) 105 (b) 50 (c) 55 (d) 90 (e) 35
12. Find number of students who studies English.
 (a) 40 (b) 90 (c) 70 (d) 50 (e) 20
13. Students studying only Math are what percent of students studying only Science?
 (a) 200% (b) 50% (c) 175% (d) 350% (e) 100%
14. Students studying only English and Math together are how much more or less than students studying only English and Science together?
 (a) 50 (b) 10 (c) 30 (d) 20 (e) 40
15. Students studying Math and Science together are what percent of students studying only English?
 (a) 25% (b) 50% (c) 175% (d) 100% (e) 150%

Directions (16-20): Read the passage given below and answer the following questions.

Three products are available on a shop – Pastry, Patty & Cake. Ratio of number of people who bought only Cake, only Pastry & only Patty is 5:8:4 respectively. People who bought both Cake and Pastry but not Patty are 50% of people who bought both Pastry and Patty but not Cake. People who bought both Cake and Patty but not Pastry are 50% more than people who bought both Cake and Pastry but not Patty. People who bought all three products together are 10% of people who bought only Cake. Total number of people who bought Cake is 800 and total number of people who bought Patty is 800.

16. Find total number of people who bought both Cake and Pastry.
 (a) 100 (b) 150 (c) 120 (d) 90 (e) 80
17. People who bought both Pastry and Patty but not Cake are what percent of people who bought only Cake?
 (a) 50% (b) 30% (c) 20% (d) 40% (e) 60%
18. Find total number of people who bought only Pastry are how much more than number of people who bought both Cake and Patty but not Pastry.
 (a) 650 (b) 670 (c) 750 (d) 720 (e) 690
19. Find total number of people who bought Pastry.
 (a) 1050 (b) 1100 (c) 1150 (d) 1000 (e) 1200
20. Find total number of people who bought at least two products.
 (a) 520 (b) 580 (c) 550 (d) 460 (e) 500

Directions (21-25): There are 1000 students in a college. Out of 1000 students some appeared in exams 'X', 'Y' and 'Z' while some not. Number of students not appeared in any exam is equal to number of students appeared in exam 'Z' only. Number of students appeared in exam 'Y' is 360. Ratio of number of students appeared in exam 'X' and 'Y' only to number of students appeared in exam 'Y' and 'Z' only is 2 : 3. Number of student appeared in exam 'X' and 'Z' both is half of number of students appeared in only exam 'Z'. Number of students appeared in exam 'X' only is 50% more than number of students appeared in 'Y' only. Number of students appeared in all the three exam is 4% of the total number of students in the college. Number of students appeared in 'Y' exam only is same as number of students appeared in 'Y' and 'Z' only.

21. How many students appeared in at least two exams?
 (a) 240 (b) 260 (c) 300 (d) 360 (e) 500
22. How many students appeared in two exams only?
 (a) 280 (b) 220 (c) 340 (d) 300 (e) 260
22. How many students appeared in at most two exams?
 (a) 240 (b) 260 (c) 300 (d) 500 (e) 960
24. How many students not appeared in exam Y?
 (a) 440 (b) 360 (c) 540 (d) 640 (e) 560
25. How many students appeared in exam X or in exam Z?
 (a) 240 (b) 360 (c) 500 (d) 680 (e) 760

Previous Years' Solutions of Prelims

Sol (1-5):

Here, total number of persons who play cricket=43 % of 800=344

total number of persons who play football=52.5 % of 800=420

total number of persons who play Hockey=55 % of 800=440

number of persons who play both cricket and football but not Hockey=96

number of persons who play both cricket and hockey but not football=100

number of persons who play both hockey and football but not cricket=88

number of persons who play all the three sports =60 number of persons who play only cricket=344 - (96+100+60)=88

number of persons who play only football =420 - (96+88+60) =176

number of persons who play only hockey =440 - (100+88+60)= 192

1. **(b):** number of persons who plays at least 2 sports=100+96+88+60= 344

Required percentage = $\frac{344}{800} \times 100 = 43\%$

2. **(c):** number of persons who play only football =420 - (96+88+60) =176

number of persons who play only hockey =440 - (100+88+60)= 192

Required difference= 192 -176 =16

3. **(d):** Number of persons who plays neither football nor cricket=800 - (88+100+60+96+88+176) =800 -608 =192

4. **(a):** number of persons who play both cricket and football but not Hockey=96

number of persons who play both hockey and football but not cricket=88

Required ratio = $\frac{96}{88} = 12:11$

5. **(d):** number of persons who play only football =420 - (96+88+60) =176

number of persons who play both cricket and hockey but not football=100

Required percentage = $\frac{176-100}{100} \times 100 = 76\%$

Sol (6-10):

Total no. of boys = $3900 \times \frac{8}{13} = 2400$

Total no. of girls = $3900 \times \frac{5}{13} = 1500$

No. of boys opted to play only badminton = $\frac{20}{100} \times 2400 = 480$

No. of girls opted to play only football = $\frac{30}{100} \times 1500 = 450$

No. of girls opted to play only cricket = $\frac{1}{5} \times 1500 = 300$

No. of girls play only cricket and badminton together = $\frac{5}{100} \times 2400 = 120$

No. of boys opted to play only football = $\frac{60}{100} \times 750 = 450$

No. of boys opted to play all the games = $\frac{1}{10} \times 2400 = 240$

No. of girls opted to play all the games = 350 - 240 = 110

No. of girls opted to play only cricket and football together = no. of girls opted to play only football and badminton together = $\frac{(1500-300-450-320-110-120)}{2} = 100$

6. **(a):** Required game is football.

7. **(c):** Required percentage = $\frac{450}{300} \times 100 = 150\%$

8. **(a):** Required difference = (240 + 110) - (110 + 120) = 350 - 230 = 120

9. **(d):** Required average = $\frac{750+450+480}{3} = 560$

10. **(e):** Required ratio = $\frac{750+150+240+110}{320+120+110+100} = \frac{1250}{650} = \frac{25}{13}$

Sol (11-15):

Let number of students studying only English be 4x

So, number of students studying only Math and English together = $4x \times \frac{25}{100} = x$

Let students studying Science be y

So, students studying only Math = y

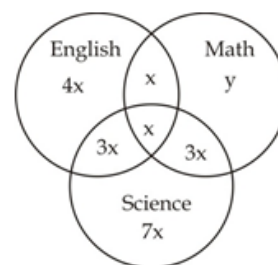
Now, students studying only Science = $\frac{175}{100} \times 4x = 7x$

Students studying all three subjects = x

Students studying Science and English together = 4x

So, students studying only Science and English together = $4x - x = 3x$

Now, students studying only Math and Science together = $3x$



ATQ,

$y = 140 \dots (i)$

And,

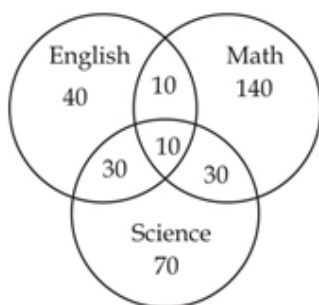
$y = 7x + 3x + 3x + x$

$y = 14x \dots (ii)$

On solving (i) & (ii), we get:

$$14x = 140$$

$$x = 10$$



11. (c): Required average = $\frac{40+70}{2} = 55$

12. (b): Required number of students
= $40 + 30 + 10 + 10 = 90$

13. (a): Required % = $\frac{140}{70} \times 100 = 200\%$

14. (d): Required difference = $30 - 10 = 20$

15. (d): Required % = $\frac{40}{40} \times 100 = 100\%$

Sol (16-20):

Let the number of people who bought only Cake, only Pastry & only Patty be $50x$, $80x$ & $40x$ respectively.

So, people who bought all three products together =

$$\frac{10}{100} \times 50x = 5x$$

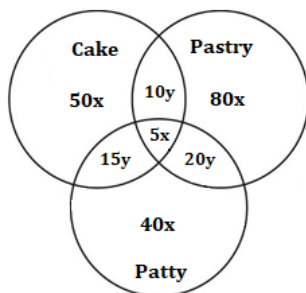
Now, let people who bought both Pastry and Patty but not Cake be $20y$.

So, people who bought both Cake and Pastry but not Patty

$$= \frac{50}{100} \times 20y = 10y$$

And, people who bought both Cake and Patty but not Pastry

$$= \frac{150}{100} \times 10y = 15y$$



ATQ,

$$50x + 5x + 10y + 15y = 800$$

$$11x + 5y = 160 \quad \dots(i)$$

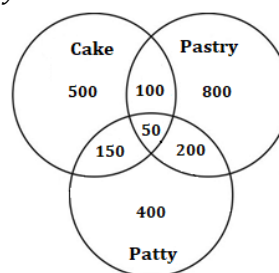
And,

$$40x + 5x + 15y + 20y = 800$$

$$9x + 7y = 160 \quad \dots(ii)$$

On solving (i) & (ii):

$$x = 10, y = 10$$



16. (b): Required number of people = $100 + 50 = 150$

17. (d): Required % = $\frac{200}{500} \times 100 = 40\%$

18. (a): Required difference = $800 - 150 = 650$

19. (c): Required number of people = $100 + 800 + 50 + 200 = 1150$

20. (e): Required number of people = $100 + 50 + 150 + 200 = 500$

Solutions (21-25):

Total students = 1000

Let, students appear in exam Z only = a

Total students appeared in exam Y = 360

Ratio of number of students appeared in exam X and Y only to students appeared in exam Y and Z only = $2 : 3$

Students appeared in exam X and Z both = $a/2$

Number of students appeared in all three exams

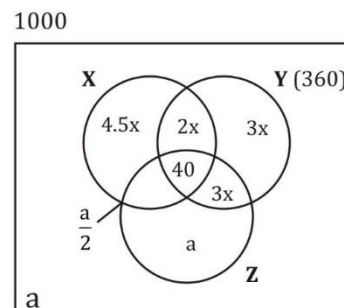
$$= \frac{4}{100} \times 1000 = 40$$

Number of students appeared in Y exam only

= No. of students appeared in Y and Z only = $3x$

Number of students appeared in exam X and Y only

$$= \frac{2}{3} \times 3x = 2x$$

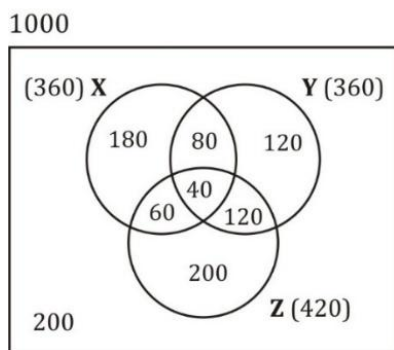


Now, $2x + 3x + 3x + 40 = 360$

$$\Rightarrow x = 40$$

and, $12.5x + a + \frac{a}{2} + a = 1000$

$$\frac{5a}{2} = 500 \Rightarrow a = 200$$



21. (c); Students appeared in at least two exams = $80 + 60 + 40 + 120 = 300$
22. (e); Students appeared in two exams only = $80 + 60 + 120 = 260$
23. (e); Students appeared in at most two exams = $180 + 120 + 200 + 60 + 80 + 120 + 200 = 960$
24. (d); Student not appeared in exam Y = $1000 - 360 = 640$
25. (d); Students appeared in exam X or in exam Z

Previous Years' Questions of Mains

Directions (1-5): In a coaching class total no. of students are 336 and each student likes at least one subject out of three subjects i.e. (quant, reasoning and English). No. of students who like only quant are 60 and no. of students who like reasoning with at most one more subject are $133\frac{1}{3}\%$ more than no. of students who likes only English. Total no. of students who like all three subjects are $7\frac{1}{7}\%$ of total students of the class and ratio of students who like both quant and English only, no. of students who like both reasoning and English only and student who like both quant and reasoning only are 1:3:2. Total no. of students who like at least two subjects are 96.

- Find no. of students who likes only reasoning?
(a) 108 (b) 124 (c) 112 (d) 144 (e) 132
- What is the ratio of students who like both quant and reasoning only to students who like all the subjects together?
(a) 1:2 (b) 2:3 (c) 1:1 (d) 2:1 (e) None of these.
- No. of students who likes both quant and English are what percent of students who likes only English?
(a) 25% (b) 20% (c) 40% (d) 33.33% (e) 50%
- What is the average no. of students who likes only quant, only English and only reasoning?
(a) 72 (b) 60 (c) 80 (d) 100 (e) 75
- No. of students who like both reasoning and English are what percent of students who like English?
(a) 41.33% (b) 20% (c) 33.33% (d) 33.67% (e) $41\frac{2}{3}\%$

Directions (6-10): Study the following information carefully and answer the questions given below.

Out of 6000 students from a college X, 20% of total students have majored in physics only, 12% have majored in chemistry only. 20% have majored in both chemistry & mathematics only. 5% of total students have majored in all three subjects together while 45% students have majored in only two subjects. In chemistry, 45% students have majored.

- How many students have majored in only one subject?
(a) 2400 (b) 2200 (c) 3000 (d) 3600 (e) 2000
- How many students have majored in Mathematics as a subject?
(a) 1080 (b) 2520 (c) 3600 (d) 2700 (e) 3300
- What is the total number of students who have majored in only 2 subjects?
(a) 1020 (b) 2700 (c) 1200 (d) 3000 (e) 2100
- Students who have majored in both Mathematics & Physics only are what percent of total students who have majored in physics?
(a) 76% (b) 36% (c) 40% (d) 44% (e) 34%
- Find the ratio of students who have majored in Physics to students who have majored in all three subjects together.
(a) 13 : 2 (b) 8 : 3 (c) 7 : 1 (d) 10 : 1 (e) None of the above.

Direction (11-15): Certain number of people work in retail, online and door to door stores. There are only three type stores and each people works in one or more store. 72% of people were in retail store and people working in only door to door store was $\frac{1}{36}$ th of people working in retail store. Number of people working in both door-to-door store and online store but not in retail store are 55. People working in only online store are 65 more than the people working in only door to door store. Number of people working in only retail store is $\frac{160}{3}$ % more than number of people working in online store.

11. What is the number of people who works in retail store, but not only in retail store?
(a) 225 (b) 245 (c) 115 (d) 105 (e) 75
12. What is the total number of people working in all stores?
(a) 360 (b) 300 (c) 250 (d) 400 (e) 500
13. What is the number of people working in online store only?
(a) 65 (b) 55 (c) 75 (d) 80 (e) 15
14. If number of people working in retail and online but not in door to door are 105 then what % of people are there, who work both in retail and door to door stores?
(a) 28% (b) 14% (c) 35% (d) 49% (e) 56%
15. Number of people working in retail or online store is what percent of people working in only online or only in retail?
(a) $205\frac{15}{17}\%$ (b) $246\frac{17}{19}\%$ (c) $229\frac{9}{13}\%$ (d) $257\frac{17}{19}\%$ (e) $217\frac{13}{17}\%$

Directions (16- 20): Read the given data carefully and answer the following questions.

In a college there are 240 (Boys + Girls) students who have taken Biology, History and Geography as their subjects.

Boys : 30 boys have taken only Biology and 22 boys have taken all the three subjects together. Ratio of boys who have taken Biology and History together but not Geography, boys who have taken History & Geography together but not Biology and the boys who have taken Biology and Geography together but not history is 4 : 5 : 3. The sum of boys taken only History and only Geography as their subject is 20 less than total number of girls. Number of boys taken only History is $\frac{1}{10}$ th of total students.

Girls : Total number of girls is 50% less than the number of boys. The number of girls who have taken only Geography is 3 less than number of boys who have taken only History and also three more than number of girls who have taken all the three subjects together. Total number of girls who have taken only one subject is 39. Girls who have taken both Biology and Geography together but not History is half of total number of girls who have taken only Biology and only History. Number of girls who have taken Biology and History together but not Geography is equal to girls who have taken only Biology. Number of girls who have taken only History is 10 and is 4 more than number of girls taken History and Geography together but not Biology.

16. Total number of students who have taken only History is how many more or less than number of students who have taken only Biology?
(a) 3 more (b) 4 less (c) 5 more (d) 4 less (e) 3 less
17. Number of students taken all the three subjects together is what percent more or less than students who have taken Biology and History together but not Geography.
(a) 60% (b) $62\frac{1}{2}\%$ (c) 75% (d) $66\frac{2}{3}\%$ (e) $72\frac{1}{2}\%$
18. Find the ratio of number of girls who have taken only Biology to the number of boys who have taken Biology and Geography together but not History.
(a) 2 : 3 (b) 3 : 4 (c) 1 : 2 (d) 3 : 5 (e) 4 : 5
19. Find average number of students who have taken only one subjects?
(a) 39 (b) 40 (c) 43 (d) 45 (e) 41
20. How many students have not taken exactly two subjects together?
(a) 169 (b) 175 (c) 165 (d) 162 (e) 172

Direction (21 – 25): The given below data is about students who like three different cricket players. Read the data carefully and answer the questions:

There are I to XII standard in school and capacity of each standard is 180. Total number of students who like M.S Dhoni is 25 % of total number of students in the school and total number of students who like Virat Kohli is 40 % more than total number of students who like M.S Dhoni. 75 % of remaining number of student in the school like Rohit sharma and remaining students do not like any three of them. Total number of students who like only M.S Dhoni & Virat Kohli but not Rohit Sharma is 25 % of total number of students who like Virat Kohli and number of Students who like only Virat Kohli & Rohit Sharma but not M.S Dhoni is 21 more than Total number of students who like only M.S Dhoni & Virat Kohli but not Rohit Sharma. Total number of Students who like M.S Dhoni & Rohit Sharma but not Virat Kohli is 39 more than $12\frac{1}{2}$ % of total number of students who like Rohit Sharma. Total number of students who like all three players are 50 % of Total number of Students who like M.S Dhoni & Rohit Sharma but not Virat Kohli.

21. Total number of students who like only M.S. Dhoni & Virat Kohli Together is what percent more than total number of students who like only Rohit Sharma?

- (a) $83\frac{17}{43}\%$ (b) $81\frac{17}{43}\%$ (c) $85\frac{17}{43}\%$ (d) $87\frac{17}{43}\%$ (e) $91\frac{17}{43}\%$

22. Find total number of students who like at least two players?

- (a) 579 (b) 589 (c) 575 (d) 580 (e) 590

23. Total number of students who like all three players is what percent less total students do not like any players?

- (a) $65\frac{2}{9}\%$ (b) $75\frac{2}{9}\%$ (c) $72\frac{2}{9}\%$ (d) $79\frac{2}{9}\%$ (e) $81\frac{2}{9}\%$

24. Find total number of students who like at least one player?

- (a) 1844 (b) 1944 (c) 1644 (d) 1744 (e) 1922

25. Find the ratio between total number of students who like only M.S Dhoni & Virat Kohli but not Rohit Sharma to total students who like only Virat Kohli & Rohit Sharma but not M.S Dhoni?

- (a) 9 : 10 (b) 10 : 9 (c) 9 : 11 (d) 9 : 13 (e) 9 : 14

Directions (26-30): Study the passage given below and answer the following questions.

Passage gives information about tourists from India who visited at least 1 country out of USA, UK and Australia. Ratio of total tourists from India who visited USA, UK and Australia is 3:4:3 respectively. Total tourists from India who visited all 3 countries together are 500.

Ratio of tourists from India who visited only USA to total tourists from India who visited UK is 1:5. Tourists from India who visited both USA and UK but not Australia are equal to tourists from India who visited both Australia and UK but not USA. Tourists from India who visited both USA and Australia but not UK are 700. Tourists from India who visited only USA are 800. Tourists from India visited only these 3 countries.

26. Find total number of tourists from India who visited only one country.

- (a) 2500 (b) 3100 (c) 2900 (d) 2700 (e) 2300

27. Total tourists from India who visited only one more country along with Australia is what percent of total tourists from India who visited UK?

- (a) 38.5% (b) 42.5% (c) 54.5% (d) 56.5% (e) 75.5%

28. Find the total number of tourists from India who visited exactly 2 countries.

- (a) 3200 (b) 3500 (c) 2500 (d) 2700 (e) 2400

29. Total tourists from India who visited both USA and UK together are what percent more or less than total tourists from India who visited Australia?

- (a) 80% (b) 40% (c) 70% (d) 60% (e) 50%

30. Find total number of tourists from India who visited at least one country.

- (a) 10000 (b) 7500 (c) 6300 (d) 6000 (e) 6700

Direction (31 - 33): Read the data carefully and answer of the questions.

There are 350 students in a school who like Orange, Grapes and Apple and students can like more than one fruit as well. 6% of total students like only Orange, 18% of total students like only Apple and 12% of total students like only Grapes. X% of total students like Orange and Grapes but not Apple. Y% of total students like Apple and Orange but not Grapes and Z% of total students like Apple and Grapes but not Orange. Value of X, Y & Z is multiple of ten and no value are same.

31. How many students like all three fruits?

- (a) 28 (b) 21 (c) 14 (d) 7 (e) Can't determine

32. What would be maximum value of total students who like Apple, Orange but not Grapes?

- (a) 105 (b) 70 (c) 210 (d) 35 (e) Can't determine

33. What would be minimum difference between total students like Orange and Grapes but not Apple and total students like Apple and Grapes but not Orange?

- (a) 105 (b) 42 (c) 70 (d) 35 (e) Can't determine

Previous Years' Solutions of Mains

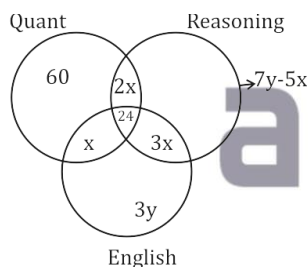
Sol (1-5): Total no. of students who like all three subjects together = $336 \times \frac{50}{700} = 24$

Let no. of students who like only English = $3y$

Let students who like both quant and English only, no. of students who like both reasoning and English only and student who like both quant and reasoning only are x , $3x$ and $2x$ respectively.

So, no. of students who like only Reasoning = $3y \times \frac{700}{300} -$

$$2x - 3x \\ = 7y - 5x$$



ATQ

$$2x + x + 24 + 3x = 96$$

$$6x = 72$$

$$x = 12$$

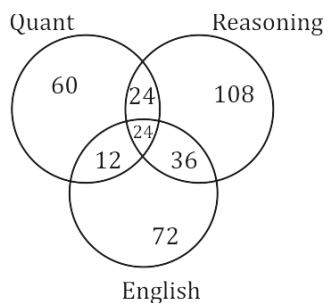
And

$$60 + 96 + 7y - 5x + 3y = 336$$

$$60 + 96 + 7y - 60 + 3y = 336$$

$$10y = 240$$

$$y = 24$$



1. (a): Required no. of students = 108

2. (c): Required ratio = $24:24 = 1:1$

3. (e): Required percentage = $\frac{12+24}{72} \times 100 = 50\%$

4. (c): Required average = $\frac{336-96}{3} = 80$

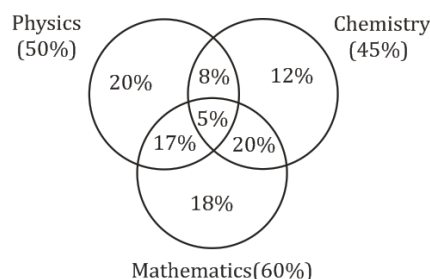
5. (e): Required percentage = $\frac{24+36}{12+24+36+72} \times 100$
 $= \frac{60}{144} \times 100 = 41\frac{2}{3}\%$

Sol (6-10):

Students who majored in both Physics and Chemistry only = $(45 - 12 - 20 - 5)\%$
 $= 8\%$

Students who majored in both Physics and Mathematics only = $(45 - 20 - 8)\% = 17\%$

Students who majored in Mathematics only = $(100 - 20 - 8 - 12 - 17 - 5 - 20)\% = 18\%$



(Venn Diagram showing % of students in various Subjects)
 Total Students = 6000

6. (c): Students who have majored in only one subject = $(20 + 12 + 18)\%$ of 6000
 $= 50\%$ of 6000 = 3000

7. (c): Students who have majored in Mathematics = $(17 + 5 + 20 + 18)\%$ of 6000
 $= 60\%$ of 6000 = 3600

8. **(b):** Students who have majored in only 2 subjects
 $= (17 + 8 + 20)\% \text{ of } 6000$
 $= 45\% \text{ of } 6000 = 2700$
9. **(e):** Students who have majored in both Mathematics & Physics only $= 17\% \text{ of } 6000 = 1020$
 Students who have majored in Physics $= (20 + 8 + 5 + 17)\% \text{ of } 6000$
 $= 50\% \text{ of } 6000$
 $= 3000$
 required percentage $= \frac{1020}{3000} \times 100 = 34\%$

10. **(d):** Required ratio $= \frac{(20+8+5+17)}{5} = 10 : 1$

Solutions (11-15)

Let total people $\rightarrow 100x$

People working in Retail stores $\rightarrow 72x$

People working in only door to door $\rightarrow 2x$

People working in only online store $\Rightarrow 2x + 65$

People working in online and door to door but not in retail $= 55$

Also

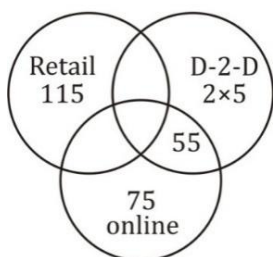
$$(100x - 72x - 2x) - (2x + 65) = 55$$

$$24x - 65 = 55$$

$$24x = 120$$

$$x = 5$$

Total number of people working in retail store $\rightarrow 72 \times 5 = 360$



People working in only retail store $\rightarrow 75 \times \frac{46}{30} = 115$

11. **(b):** Number of people working in retail store $\rightarrow 360$

People working only in retail store $= 115$

Required number $= 360 - 115 = 245$

12. **(e):** Total people $\rightarrow 100 \times 5 = 500$

13. **(c):** People working in online store

Only $= 75$

14. **(a):** People working in both retail and door to door stores

$$= 360 - 115 - 105 = 140$$

$$\text{Required \%} = \frac{140 \times 100}{500} = 28\%$$

15. **(d):** People working in Retail or online store $= 500 - 10 = 490$

People working in only online or only retail

$$\Rightarrow 75 + 115 = 190$$

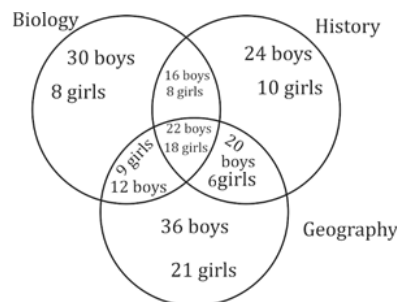
$$\% \Rightarrow \frac{490}{190} \times 100 = 257 \frac{17}{19}\%$$

Sol. (16-20):

Total students $= 240$

$$\text{Girls} = \frac{50}{150} \times 240 = 80$$

Boys $= 160$



Boys who have taken only biology $= 30$

Let boys who have taken Biology and History but not geography be $4x$, boys who have taken history and Geography but not Biology be $5x$ and boys who have taken biology and Geography but not history be $3x$

Total number of boys who have taken only history and only Geography together $= 80 - 20 = 60$

Atq,

$$30 + 22 + 4x + 5x + 3x + 60 = 160$$

$$\Rightarrow 12x = 48 \Rightarrow x = 4$$

Girls who have taken only geography is $= \frac{1}{10} \times 240 - 3 = 21$

Girls who have taken all the three subjects $= 21 - 3 = 18$

Girls who have taken only history and only biology $= 39 - 21 = 18$

Girls who have taken both biology and Geography but not History $= \frac{18}{2} = 9$

Let number of girls who have taken only biology be x

Number of girls who have taken history and Geography but not biology $= 10 - 4 = 6$

Atq,

$$80 = 21 + x + x + 10 + 6 + 9 + 18$$

$$x = 8$$

16. **(b):** Required difference $= (30 + 8) - (24 + 10) = 4$ less

$$17. \text{ (d): Required \%} = \frac{(22+18)-(16+8)}{(16+8)} \times 100$$

$$= \frac{16}{24} \times 100 = 66 \frac{2}{3}\%$$

$$18. \text{ (a): Required ratio} = \frac{8}{12} = 2 : 3$$

$$19. \text{ (c): Required average} = \frac{(30+8)+(24+10)+(36+21)}{3} = 43$$

20. **(a):** Required number $= 240 - \{(16 + 8) + (20 + 6) + (9 + 12)\}$

Sol. (21 - 25):

Total number Of students in school = $180 \times 12 = 2160$

Total students like M.S. Dhoni = $2160 \times \frac{25}{100} = 540$

Total students like Virat Kohli = $540 \times \frac{140}{100} = 756$

Total students like Rohit Sharma = $(2160 - 540 - 756) \times \frac{75}{100} = 648$

Total students do not like any players = $(2160 - 540 - 756 - 648) = 216$

Total number of students who like only M.S Dhoni & Virat Kohli but not Rohit Sharma

$$= 756 \times \frac{25}{100} = 189$$

Total students who like only Virat Kohli & Rohit Sharma but not M.S Dhoni = $189 + 21 = 210$

Total Students who like M.S Dhoni & Rohit Sharma but not Virat Kohli = $648 \times \frac{1}{8} = 81 + 39 = 120$

Total students who like all three players = $120 \times \frac{50}{100} = 60$

Total Students who like Only M.S Dhoni

$$= 540 - (189 + 120 + 60) = 171$$

Total students who like Only Virat Kohli

$$= 756 - (189 + 210 + 60) = 297$$

Total students who like only Rohit Sharma

$$= 648 - (210 + 120 + 60) = 258$$

21. (b): Total number of students who like only M.S. Dhoni & Virat Kohli together = $171 + 297 = 468$

Total students who like only Rohit Sharma = 258

$$\text{Required percentage} = \frac{468 - 258}{258} \times 100 = 81\frac{17}{43}\%$$

22. (a): Total number of students who like at least two players = $189 + 210 + 120 + 60 = 579$

23. (c): Required percentage = $\frac{216 - 60}{216} \times 100$
 $= \frac{156}{216} \times 100 = 72\frac{2}{9}\%$

24. (b): Total number of students who like at least one player = $2160 - 216 = 1944$

25. (a): Required ratio = $\frac{189}{210} = 9 : 10$

Sol (26-30):

Total tourists from India who visited UK = $800 \times 5 = 4000$

Total tourists from India who visited USA = $4000 \times \frac{3}{4} = 3000$

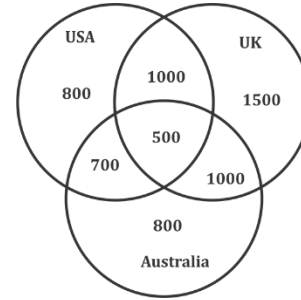
Total tourists from India who visited Australia = $4000 \times \frac{3}{4} = 3000$

So, tourists from India who visited both USA and UK but not Australia = $3000 - 800 - 500 - 700 = 1000$

Hence, tourists from India who visited both Australia and UK but not USA = 1000

Now, tourists from India who visited only Australia = $3000 - 500 - 700 - 1000 = 800$

And, tourists from India who visited only UK = $4000 - 1000 - 500 - 1000 = 1500$



26. (b): Required number of tourists = $800 + 1500 + 800 = 3100$

27. (b): Tourists from India who visited only one more country along with Australia = $700 + 1000 = 1700$
 Required % = $\frac{1700}{4000} \times 100 = 42.5\%$

28. (d): Required number of tourists = $1000 + 700 + 1000 = 2700$

29. (e): Total tourists from India who visited both USA and UK together = $1000 + 500 = 1500$
 Required % = $\frac{(3000 - 1500)}{3000} \times 100 = 50\%$

30. (c): Required number of tourists = $800 + 1000 + 1500 + 700 + 500 + 1000 + 800 = 6300$

Sol. (31 - 33):

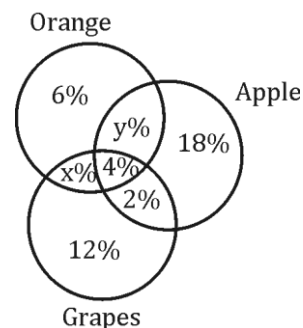
Total students who like only Orange, only Grapes and only Apple = $6\% + 18\% + 12\% = 36\%$

Given, Value of X, Y & Z is multiple of ten and no value are same

So only possible value of $(X\% + Y\% + Z\%)$ should be 60%

Let assume $X\% = 10\%$, $Y\% = 20\%$ and $Z = 30\%$ (Note- Value of X can be any multiple of 10 like 10% or 20% or 30%, And same of Y and Z also)

Total students who like all three fruits = $100\% - 36\% - 60\% = 4\%$



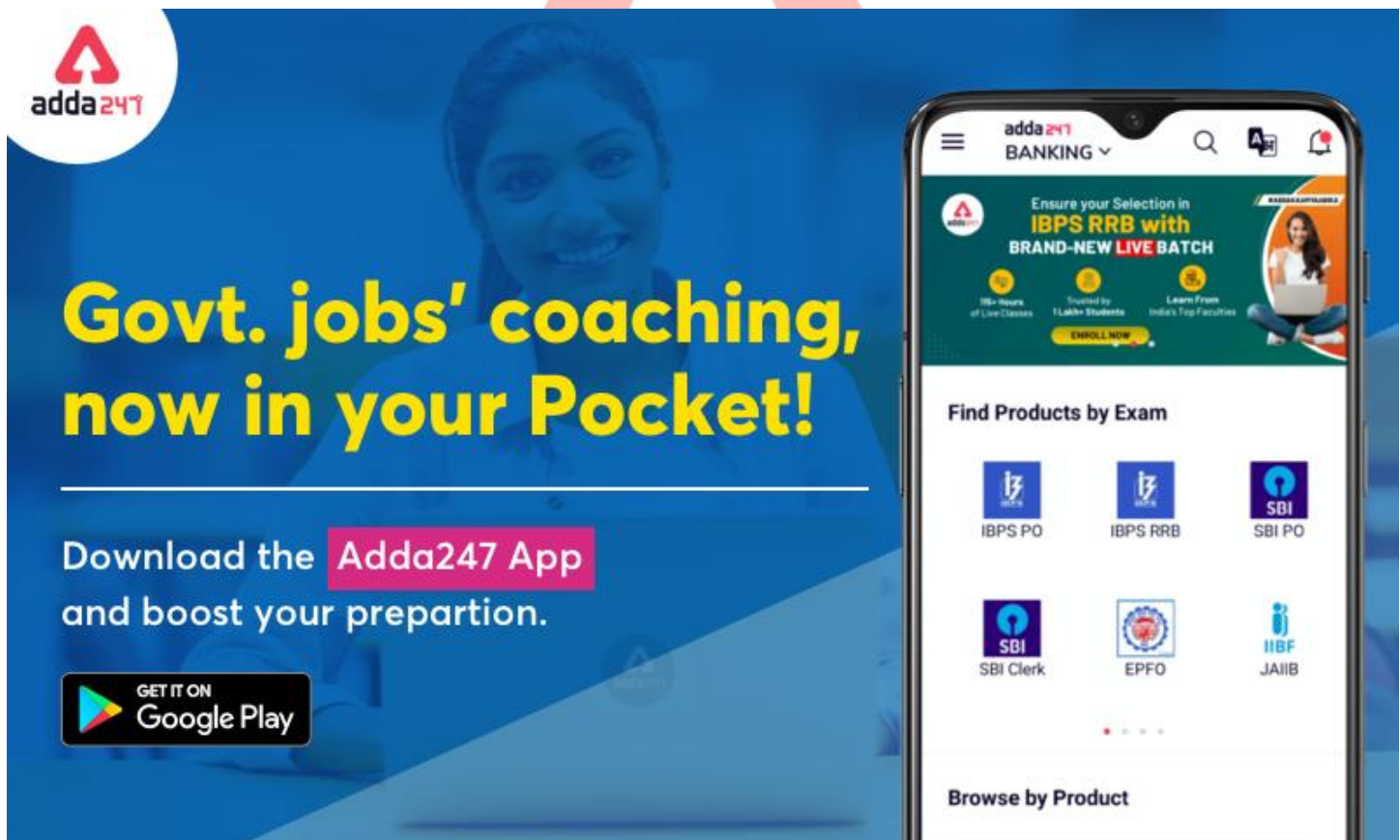
31. (c): Total students who like all three fruits = 4% of 350
 $= \frac{4}{100} \times 350 = 14$

32. (a): For maximum value of students who like Apple, Orange but not Grapes, value of Y should be 30%
 So, required number = $350 \times \frac{30}{100} = 105$

- 33. (d):** For minimum difference between total students like Orange and Grapes but not Apple and total students like Apple and Grapes but not Orange
 When, $X = 10\%$ then $Z = 20\%$
 $X = 30\%$ then $Z = 20\%$
 Difference = 10%
 Similarly, when $Z = 10\%$ then $X = 20\%$
 $Z = 30\%$ then $X = 20\%$

Difference = 10%

So, minimum difference between total students like Orange and Grapes but not Apple and total students like Apple and Grapes but not Orange = 10% of 350
 $= \frac{10}{100} \times 350 = 35$



The advertisement features a blue background with a woman's face. On the left, the Adda247 logo is in the top left corner. Below it, the text "Govt. jobs' coaching, now in your Pocket!" is written in large yellow font. Underneath, it says "Download the Adda247 App and boost your preparation." with a pink box around "Adda247 App". At the bottom left is a "GET IT ON Google Play" button. On the right, a smartphone displays the app's interface, which includes a "BANKING" header, a banner for "IBPS RRB with BRAND-NEW LIVE BATCH", and a section titled "Find Products by Exam" with icons for IBPS PO, IBPS RRB, SBI PO, SBI Clerk, EPFO, and IIBF JAIIB. At the bottom of the phone screen is a "Browse by Product" section.

Arithmetic and Filler Caselet – (DI-III)

(iii) Arithmetic Based & Filler Based Caselet DI - Nowadays Caselet DI is asked, in which data is provided from the topics based on arithmetic. To solve these Caselets one has to be well versed in arithmetic topics and their respective concepts. Also, some times in these arithmetic DI which has fillers or blanks are given and these filler or blanks contains certain data which we find with the help of given data in paragraph of with the help of questions associated with Caselet.

Before start solving Arithmetic Based & Filler Based Caselet DI, you must have knowledge of following things.

- (a) Basic concept of addition, multiplication, percentage, average, ratio & proportion, fractions etc.
- (ii) Basic concept of all arithmetic topics, i.e., Time and Work, Simple & Compound Interest, Speed Time Distance, Profit and Loss, partnership, Train, Boat and stream & Mensuration etc.



Arithmetic Based & Filler Based Caselet DI contains:

- Concept with Solved Examples
- Practice MCQs for Prelims
- Practice MCQs for Mains
- Previous Years' Questions of Prelims
- Previous Years' Questions of Mains

Solved Example

Directions (1-5): Read the data given below carefully and answer the following questions.

Veer alone can complete a work in 36 days and Ayush alone can complete the same work in 54 days. The efficiency of Shivam is 50% less than the efficiency of Veer and the time taken by Anurag to complete the same work alone is 45 days less than the time taken by Shivam to complete the same work alone.

- In how many days Shivam alone can complete the same work?
(a) 64 days (b) 72 days (c) 74 days (d) 60 days (e) 54 days
- Find out the number of days taken by Anurag and Ayush together to complete the same work?
(a) 14 days (b) 12 days (c) 16 days (d) 18 days (e) 20 days
- Find the ratio of the efficiency of Veer to that of Anurag respectively to complete the same work?
(a) 5:4 (b) 3:4 (c) 5:3 (d) 4:3 (e) 1:1
- The total wage given for the work is Rs. 21000 and all four worked together, then find the wage share of Anurag?
(a) Rs. 6400 (b) Rs. 7200 (c) Rs. 6600 (d) Rs. 8400 (e) Rs. 8000
- If Deepak is 25% less efficient than Anurag, then find in how many days Deepak can complete twice of the same work?
(a) 64 days (b) 72 days (c) 74 days (d) 60 days (e) 54 days

Sol. (1-5)

Let the total work = 108 unit (LCM of 36 & 54)

So, the efficiency of Veer = $\frac{108}{36} = 3 \text{ unit/day}$

The efficiency of Ayush = $\frac{108}{54} = 2 \text{ unit/day}$

Now, the efficiency of Shivam = $3 \times \frac{100-50}{100} = 1.5 \text{ unit/day}$

So, time taken by Shivam to complete same work alone = $\frac{108}{1.5} = 72 \text{ days}$

So, time taken by Anurag to complete same work alone = $72 - 45 = 27 \text{ days}$.

Efficiency of Anurag = $\frac{108}{27} = 4 \text{ unit/day}$

- (b):** Required days = 72 days.
- (d):** Required days = $\frac{108}{(4+2)} = 18 \text{ days}$.
- (b):** Required ratio = 3 : 4
- (e):** We know wage are given in the ratio of their efficiency.
So, wage share of Anurag = $21000 \times \frac{4}{3+2+1.5+4} = \text{Rs.}8000$
- (b):** Efficiency of Deepak = $\frac{75}{100} \times 4 = 3 \text{ unit/day}$
Required days = $\frac{2 \times 108}{3} = 72 \text{ days}$.

Directions (6-10) paragraph given below gives information about three users of Adda247.

Adda247 publication sells books whose marked price varies with time. Deepak, Shivam and Dharam bought 3 books of each type i.e. X, Y and Z at different time. So, sum of marked price of all three types for each i.e. Deepak, Shivam and Dharam are in ratio 3:4:2 respectively. Marked price of all three type of books for each individual is same. Deepak and Shivam each spent 80% and Dharam spent 60% of total money they have initially on book purchasing. There is a discount of 20% on each book and Dharam spent total of Rs. 1920. As Deepak is prime member so he will get additional discount of 20% on X and Z book. Shivam had a voucher so he got an additional discount on book Y due to which cost of book Y for Deepak and Shivam become equal.

- What was the additional discount percentage on book Y for Shivam?
(a) 20% (b) 25% (c) 15% (d) 10% (e) 30%
- What was the total amount spent by Deepak on purchasing all three books?
(a) Rs. 2400 (b) Rs. 2480 (c) Rs. 2580 (d) Rs. 2800 (e) Rs. 2496

8. What is the ratio of total money Shivam and Dharam have initially?
 (a) 10:9 (b) 11:6 (c) 11:9 (d) 11:8 (e) 9:8
9. Amount spent by Shivam on purchasing of book X and Y is how much percent less than amount spent by Deepak on purchasing all three books? (approx.)
 (a) 10% (b) 12% (c) 8% (d) 17% (e) 14%
10. What is the ratio of total amount spent by Deepak, Shivam and Dharam on book Y to total money Deepak has initially?
 (a) 31:32 (b) 32:39 (c) 37:41 (d) 31:37 (e) 31:41

Sol. (6-10)

Let M.R.P. of each book of each type for Deepak, Shivam and Dharam are $3x$, $4x$ and $2x$ respectively.

Price for book X, Y and Z for Dharam is $= \frac{1920}{3} = \text{Rs. } 640$

ATQ

$$2x \times \frac{80}{100} = \text{Rs. } 640$$

$$x = \text{Rs. } 400$$

$$2x = \text{Rs. } 800$$

$$3x = \text{Rs. } 1200$$

$$4x = \text{Rs. } 1600$$

$$\text{Price of book X and Z for Deepak} = 1200 \times \frac{80}{100} \times \frac{80}{100} = \text{Rs. } 768$$

$$\text{Price for book Y for Deepak} = 1200 \times \frac{80}{100} = \text{Rs. } 960$$

$$\text{Price for book X and Z for Shivam} = 1600 \times \frac{80}{100} = \text{Rs. } 1280$$

$$\text{Price for book Y for shivam} = 960 \text{ Rs.}$$

6. (b): C.P for book Y for Shivam = Rs. 960

M.R.P. for Shivam of book Y = Rs. 1600

Let additional discount is $a\%$

ATQ

$$1600 \times \frac{80}{100} \times \frac{100-a}{100} = 960$$

$$a = 25\%$$

7. (e): Required amount $= 2 \times 768 + 960 = \text{Rs. } 2496$

8. (d): total money Shivam have initially $= \frac{1280+960+1280}{80} \times 100 = \text{Rs. } 4400$

$$\text{Total money Dharam have initially} = \frac{1920}{60} \times 100 = \text{Rs. } 3200$$

$$\text{Required ratio} = \frac{4400}{3200} = 11:8$$

9. (a): amount spent by Shivam on purchasing of book X and Y $= 1280 + 960 = \text{Rs. } 2240$

$$\text{amount spent by Deepak on purchasing of books} = 768 + 960 + 768 = \text{Rs. } 2496$$

$$\text{required percentage} = \frac{2496-2240}{2496} \times 100 \approx 10\%$$

10. (b): total amount spent by Deepak, Shivam and Dharam on book Y $= 960 + 960 + 640 = \text{Rs. } 2560$

$$\text{Total money initially Deepak have} = \frac{768+960+768}{80} \times 100 = \text{Rs. } 3120$$

$$\text{Required ratio} = \frac{2560}{3120} = 32:39$$

Direction (11-15): Study the passage and answer the following question.

Management team of Adda247 has 12 employees - 4 in each of Marketing, Finance and HR team. Oldest employee is 62 years old and is employee of HR team, while youngest employee is 28 years old and he/she is employee of marketing team. Average age of whole marketing team is same as the individual age of two of its employees, two employees from HR team and one employee from Finance team. Average age of Finance team is 12.5% more than that of HR team. One employee of HR team is 8 years older than other two. Two employees of finance team have same age as the average of youngest and eldest employee of Adda247. Average age of Finance team is 50% more than that of Marketing team. All units are given in years unless mentioned.

11. What is the average age of 3 eldest employees in Management team?
 (a) $48\frac{2}{3}$ (b) $47\frac{1}{3}$ (c) $50\frac{1}{3}$ (d) $51\frac{1}{3}$ (e) None of these
12. If youngest employee of HR team replaces eldest employee of Finance team, what will be the new average age of Finance team?
 (a) 37.5 (b) 40.5 (c) 32.5 (d) 40 (e) None of these
13. If a new employee of age 60 years joins Marketing team, what will be the new average of Marketing team?
 (a) 30 (b) 32 (c) 34 (d) 36 (e) 38
14. What is difference between overall average age of Management team and average age of Finance team?
 (a) $1\frac{2}{3}$ (b) $7\frac{1}{3}$ (c) $7\frac{2}{3}$ (d) $6\frac{2}{3}$ (e) None of these
15. Two employees with their age ratio 9 : 7 joins the HR team, and average age of HR team remains same, what is difference between age of eldest and second eldest employee of Management team?
 (a) 27 (b) 02 (c) 05 (d) 17 (e) None of these

Sol (11-15)

From the information, average age of Marketing team is same as individual age of 5 employees.

Let us consider average age of Marketing team is x ... (i)

\therefore age of 2 employees of HR team is also x .

and age of 1 employee of Finance team is also x .

and age of 2 employee of Marketing team is also x .

Let the average age of HR team is $8y$... (ii)

Therefore, average age of Finance team is $\left(\frac{100+12.5}{100}\right) 8y = 9y$... (iii)

Till now we have the information, that age of 3 employees of HR team is 62, x and x .

Therefore, from the condition, that one employee of HR team is 8 years older than other two. So, age of 4th employee from HR team is $(x + 8)$ [As age 62 was highest]

Now we can say that

$$\frac{62+x+x+x+8}{4} = 8y$$

$$\Rightarrow \frac{70+3x}{4} = 8y \text{ ... (iv)}$$

Age of two employees of Finance team is $\frac{62+28}{2} = 45$ years.

From the last statement,

$$\text{Average age of Finance team} = \left(\frac{100+50}{100}\right) x = \frac{3}{2}x \text{ ... (v)}$$

From eqn. (v) and eqn. (iii)

$$9y = \frac{3}{2}x$$

$$\Rightarrow x = 6y \text{ or } y = \frac{x}{6}$$

Put this value in eqn. (iv)

$$\Rightarrow \frac{70+3x}{4} = 8 \times \frac{x}{6}$$

$$\Rightarrow 70 + 3x = \frac{16}{3}x$$

$$\frac{7x}{3} = 70 \Rightarrow x = 30$$

Therefore, age of 4 persons of HR team is

62, 38, 30 and 30.

$$\text{Now average age of Finance team} \Rightarrow \frac{3}{2}x = 45$$

$$\text{Total age} = 45 \times 4 = 180$$

2 employees of finance team have age of 45 and 1 employee of finance team have age of 30, then the 4th employee's age of finance team = $180 - (45 + 45 + 30)$

$$= 60$$

Therefore, age of 4 employees of Finance team is 45, 45, 60 30.

Similarly, age of 4th employee of Marketing team = $30 \times 4 - (30 + 30 + 28)$

$$= 32 \text{ years.}$$

Therefore,

HR	62	38	30	30
Marketing	32	30	30	28
Finance	60	45	45	30

11. (e): Required average = $\frac{62+60+45}{3} = \frac{167}{3} = 55\frac{2}{3}$

Hence none of these

12. (a): Required average = $\frac{30+45+45+30}{4}$
 $= \frac{150}{4} = 37.5$ year

13. (d): Required average = $\frac{32+30+30+28+60}{5}$
 $= \frac{180}{5} = 36$ years

14. (d): Overall average age of Adda247 = $\frac{62+38+30+30+32+30+30+28+60+45+45+30}{12} = \frac{460}{12} = 38\frac{1}{3}$

Average age of Finance = $\frac{60+45+45+30}{4} = 45$ years

Required difference = $45 - 38\frac{1}{3} = 6\frac{2}{3}$ years

15. (b): Let their age be $9x$ and $7x$.

So, $\frac{62+38+30+30+9x+7x}{6} = 40$

$16x = 240 - 160$

$16x = 80$

$x = 5$

therefore, their age are 45 and 35 years.

But still highest two age in Adda247 are 62 and 60.

So, required difference is 2 years.

Directions (21 – 25): Veer left Delhi at 11:00 A.M. for Lucknow by bus. Lucknow is (P) km away from Delhi. Speed of bus is (Q) km/hr. At 12:12 P.M. or after $\left(\frac{2}{15}\right)^{\text{th}}$ of P, bus stopped due to some technical issues. Veer starts walking at 12 km/hr in the direction of Lucknow to eat something and he stopped at a Dhaba which is 6 kms away from the point where bus stopped. Veer finished eating in 5 minutes. After eating, Veer took the same bus which is moving at 125% of Q and he met his friend Sameer at 5:47 P.M. when he was just 118 km away from Lucknow at a road side shop. Both talked for 30 minutes and decided that they will have a race to find who reaches Lucknow first. Sameer is running at a speed of (R) km/hr, while Veer is running with $133\frac{1}{3}\%$ of his walking speed. Sameer reached Lucknow 88.5 minutes earlier than Veer.

After reaching Lucknow, Sameer and Veer starts working on a task, Veer alone can complete the task in 20 hours and Sameer alone takes 20% more time than Veer to complete the same task. With the help of Ayush (who is $33\frac{1}{3}\%$ less efficient than Veer), they completed the same task together in (S) hours and they earned Rs. 21,600 as their wages on completion of the task. All three have invested their wages in a partnership business for two years and profit share of Veer is (T) out of total profit of Rs. 27,900.

21. What is the ratio of value of Q to that of the value of P?

(a) 1:8

(b) 1:9

(c) 2:15

(d) 2:21

(e) 3: 25

22. Value of Q is what times of value of R?

(a) 3 times

(b) 2 times

(c) 8 times

(d) 4 times

(e) 6 times

23. What is the value of S?

(a) 5 hours

(b) 10 hours

(c) 9 hours

(d) 6 hours

(e) 8 hours

24. What is the value of T?

(a) Rs 11750

(b) Rs 12250

(c) Rs 11160

(d) Rs 13750

(e) Rs 12950

25. Veer invested his profit share in a scheme for two years which offers CI at 20% per annum. Find the compound interest received in 2nd year?

(a) Rs 8490

(b) Rs 8370

(c) Rs 8600

(d) Rs 8210

(e) Rs 8420

Sol. (21 – 92):

Time taken to cover $\frac{2}{15}$ th of total distance between Delhi to Lucknow = 1 hour 12 minutes = $\frac{6}{5}$ hours

$$\text{Also, } \frac{2P}{15} = \frac{6Q}{5}$$

$$P = 9Q$$

Time taken by Veer to reach 'Dhaba' = $\frac{6}{12} = 30$ minutes

Time at Veer again took bus = 12:47 pm

Distance travel at the speed of $1.25Q = (P - \frac{2P}{15} - 6 - 118) = \frac{(13P-1860)}{15}$ km

Time taken to travel the distance at $1.25Q = 17.47$ pm - 12.47 pm = 5 hours

$$\frac{(13P-1860)}{15} = 1.25Q \times 5$$

$$13P - 1860 = 93.75Q$$

$$117Q - 1860 = 93.75Q$$

$$23.25Q = 1860$$

$$Q = 80 \text{ km/hr}$$

$$P = 9 \times 80 = 720 \text{ km}$$

Since, Lucknow is 118 km away where Veer met to Sameer

$$\text{Speed of Veer} = 12 \times \frac{4}{3} = 16 \text{ km/hr}$$

So, time taken by Veer to reach Lucknow at usual speed = $\frac{118}{16} = 442.5$ minutes

ATQ –

$$(442.5 - \frac{118 \times 60}{R}) = 88.5$$

$$354R = 7080$$

$$R = 20 \text{ km/hr}$$

Time taken by Veer = 20 hours

So, time taken by Sameer = $20 \times 1.2 = 24$ hours

Total work = 120 units (LCM of time taken by Veer & Sameer)

Efficiency of Veer = $120/20 = 6$ units/hour

Efficiency of Sameer = $120/24 = 5$ units/hour

Efficiency of Ayush = 4 units/hour

Time taken by Veer, Sameer & Ayush together (S) = $120/15 = 8$ hours

$$\text{Wage share of Veer} = 21600 \times \frac{6}{15} = 8640 \text{ Rs.}$$

$$\text{Wage share of Sameer} = 21600 \times \frac{5}{15} = 7200 \text{ Rs.}$$

$$\text{Wage share of Ayush} = 21600 \times \frac{4}{15} = 5760 \text{ Rs.}$$

Profit ratio of Veer, Sameer & Ayush = $(8640 \times 2) : (7200 \times 2) : (5760 \times 2) = 6 : 5 : 4$

$$\text{Profit share of Veer (T)} = 27900 \times \frac{6}{15} = \text{Rs } 11160$$

$$\text{21. (b): Required ratio} = \frac{80}{720} = 1:9$$

$$\text{22. (d): Q is 4 times of the value of R.}$$

$$\text{23. (e): S} = 8 \text{ hours}$$

$$\text{24. (c): T} = \text{Rs } 11160$$

$$\text{25. (b): CI received in two years} = \left(11160 \times \frac{150}{100} \times \frac{150}{100}\right) - 11160 = \text{Rs } 13950$$

$$\text{CI received in first year} = 11160 \times \frac{50}{100} = \text{Rs } 5580$$

$$\text{CI received in second year} = \text{Rs } 8370$$

Practice MCQs for Prelims

Directions (1-5): Study the given passage carefully and answer the questions.

A shopkeeper bought a pen & a book for Rs 500. He marked pen by 20% above cost price which is same as discount percentage given on book. He gained 8% & 12% on pen & book respectively. his gain amount in entire transaction is equal to 10% of marked price of book.

- What is cost price of book? (in Rs)
(a) 420 (b) 350 (c) 430 (d) 380 (e) 400
- Marked price of book is how much more than the selling price of pen? (in Rs)
(a) 440 (b) 452 (c) 460 (d) 456 (e) 444
- What is ratio of selling price of pen to that of book?
(a) 27 : 140 (b) 15 : 56 (c) 27 : 112 (d) 27 : 100 (e) 25 : 112
- What is average of marked price of pen & book?
(a) 340 (b) 334 (c) 330 (d) 284 (e) 278
- If no discount was offered on both then his overall gain percent is approximately what percent more than his actual gain percent?
(a) 100% (b) 167% (c) 150% (d) 220% (e) 200%

Directions (6-10): Study the given passage carefully and answer the questions.

Chiku can complete a work in X days while Mahi takes 'X+5' days to complete same work. If Chiku & Gabbar work together, they take 7.5 days to complete the work. If all three work together they take $\frac{X}{2}$ days to finish the work.

- In how many days Gabbar alone can complete the work?
(a) 35 (b) 30 (c) 20 (d) 25 (e) 15
- What is value of Y if $Y = X^3 - 10X^2 + 12X - 12$?
(a) 2108 (b) 1032 (c) 1008 (d) 132 (e) 108
- What is ratio of time taken by Chiku & Mahi together to complete the work to time taken by Gabbar to complete the work with double of his efficiency?
(a) 1 : 5 (b) 5 : 2 (c) 2 : 5 (d) 5 : 1 (e) 5 : 3
- Time taken by Mahi alone to finish the work is what percent of time taken by Chiku & Gabbar together to finish double the actual work?
(a) 110% (b) 75% (c) 98% (d) 100% (e) 105%
- Chiku work on first day, Mahi work for next 2 days and then Gabbar work for next 3 days. This pattern continues till the work is finished. Find the total time taken.
(a) 18 days (b) 17.5 days (c) 18.5 days
(d) 19 days (e) None of the given options

Direction (11-15): Read the given information carefully and answer the following question.

Ramu bought three articles TV, Washing Machine and AC he paid total of Rs. 51,000 to the shopkeeper. The cost price of Washing Machine is 20% less than that of AC and the ratio of CP of TV and AC is 3:4. Ramu made a profit of 18% on selling TV, 35% profit on washing machine and 22.5% of profit on selling AC.

- Find the average of the selling price of TV and AC?
(a) Rs. 20,600 (b) Rs. 21,100 (c) Rs. 20,100 (d) Rs. 21,600 (e) Rs. 21,800
- The total profit earned on TV and AC together is what percent more or less than the profit earned on washing machine?
(a) 25% (b) $22\frac{1}{2}\%$ (c) $27\frac{1}{7}\%$ (d) $28\frac{4}{7}\%$ (e) 30%
- Ramu gave a discount of 20% on AC while selling it. in order to gain the same profit on AC, how much percent above the cost price, he should marked it.
(a) $53\frac{1}{8}\%$ (b) $50\frac{1}{4}\%$ (c) 55% (d) $54\frac{3}{8}\%$ (e) $56\frac{5}{8}\%$

14. Find the total profit earned by Ramu on selling all the three articles?
 (a) Rs. 11,800 (b) Rs. 12,600 (c) Rs. 12,800 (d) Rs. 13,200 (e) Rs. 13,800
15. Ramu purchased a Laptop at a price 115% higher than the SP of washing machine. Then find the difference between the CP of Laptop alone and CP of TV, washing machine and AC together?
 (a) Rs. 4400 (b) Rs. 4900 (c) Rs. 4500 (d) Rs. 4800 (e) Rs. 4560

Directions (16-20): Read the paragraph carefully and answer the questions

Mr. DK started telecommunications and he need to purchase some item for this. He purchased X no of chairs, Y no. of tables. He also purchased mobiles and laptops. No. of mobiles are 9 less than no. of chairs and total cost of purchasing chairs are Rs. 200 less than that of tables. M.R.P. of chair and table is same; Mr. DK purchased these two items at $16\frac{2}{3}\%$ and $33\frac{1}{3}\%$ discount respectively. Total cost of purchasing laptop and mobiles are Rs. 65000 and no. of laptop are 4 more than no. mobiles and 3.5% of purchasing cost of a table. Cost of a laptop is 8000 which is $33\frac{1}{3}\%$ more than twice of cost of a mobile.

16. If Mr. DK had purchased mobile and laptop at 40% and 11.11% discounts respectively, then find difference between their M.R.P.?
 (a) Rs. 5000 (b) RS. 8000 (c) Rs.2000 (d) Rs. 4000 (e) Rs. 9000
17. Find total amount spent on purchasing 10 chairs and 8 table?
 (a) Rs. 4100 (b) Rs. 4000 (c) Rs. 6100 (d) Rs. 3100 (e) Rs. 6500
18. No. of laptops are how much percent more than no. of mobiles purchased?
 (a) 137.5% (b) 133.33% (c) 114.28% (d) 112.5% (e) None of these.
19. Find average money spent by Mr. DK on purchasing of all items? (approx.)
 (a) Rs.1800 (b) Rs. 1754 (c) Rs. 1874 (d) Rs. 1990 (e) Rs. 2109
20. If X men can do a work in 2 days and Y women can do the same work in 4 days find ratio of efficiency of men to women?
 (a) 8:3 (b) 3:4 (c) 1:2 (d) 2:1 (e) 4:3

Directions (21-25): Read the given information carefully and answer the following questions.

Aayush has two daughters (Sneha and Neha) and two sons (Vivek and Vikash). Present age of Aayush is equal to the sum of present age of both the sons and 125% of the sum of present age of both the daughters. 8 years ago, Vikash was 20 years elder to Sneha who was that time 16 years younger to her sister. 10 years ago, ratio of age of Aayush to that of Vivek at that time was 3:1.

21. Find the ratio of age of Neha four years later to that of age of Vivek ten years later?
 (a) 2 : 1 (b) 1 : 2 (c) 1 : 1 (d) 3 : 2 (e) 2 : 3
22. Find the average of present age of all the five members?
 (a) 39.6 years (b) 39.4 years (c) 38.8 years (d) 38.4 years (e) 39.2 years
23. Find the difference between sum of present age of Vivek and Vikash together and the sum of present age of Sneha and Neha together?
 (a) 14 years (b) 21 years (c) 18 years (d) 20 years (e) 12 years
24. Difference between the age of the eldest child and that of the youngest child is what percent of the present age of Neha?
 (a) $44\frac{4}{9}\%$ (b) $55\frac{5}{9}\%$ (c) $57\frac{1}{2}\%$ (d) $66\frac{2}{3}\%$ (e) 60%
25. If ratio of age of Aayush's wife four years ago to that of her eldest child four years ago was 5: 3 then find the difference between age of Aayush and that of his wife 15 years hence?
 (a) 4 years (b) 10 years (c) 5 years (d) 6 years (e) 8 years

Directions (26-30): Paragraph gives information about cost price, selling price and profit or loss percentage of five different articles (A, B, C, D and E) manufactured by the company. Read the paragraph and give answer based on it.

Total cost price of five article is Rs 43200. Ratio of cost price of article B, C and E is 7:6:9 respectively. Company earns 10%, 15% and 20% profit on article A, D and E and 15%, 22% loss on article B and C respectively. Cost price of article A is Rs. 8160. Ratio of selling price of article D to E is 23:30.

26. What is the ratio of average selling price of article A and B to average cost price of article C and D?
 (a) 1294: 1333 (b) 1343: 1320 (c) 1211: 1343 (d) None of these (e) 1296: 1333
27. What is the difference between profit earned on article E and loss incurred on article B?
 (a) Rs.800 (b) Rs. 850 (c) Rs.925 (d) Rs.900 (e) Rs.875
28. If company want to sell article C at 17% profit, then new selling price will be how much percent more than previous selling price of that article?
 (a) 50% (b) 25% (c) 20% (d) 22% (e) 54%
29. Difference between maximum selling price and second minimum cost price among these five articles is what part of cost price of article C?
 (a) $\frac{3}{4}$ (b) $\frac{1}{4}$ (c) $\frac{1}{3}$ (d) $\frac{5}{6}$ (e) $\frac{2}{3}$
30. If company marks Rs. 13440 for article B and sold it at 25% discount, then find new profit earned is how much more or less than the previous loss for article B?
 (a) Rs.580 (b) Rs.420 (c) Rs.480 (d) Rs.540 (e) None of these.

Directions (31-35): Read the data carefully and answer the question.

On a store there are three items available i.e. (book, bat and calculator). Bat and calculator are available in three size i.e. small, medium and large. Shopkeeper sold a book for Rs. 540 after giving 10% discount and earn 20% profit. Cost price of a small size bat or a large calculator is equal to selling price of book and small size of each item is 25% cheaper than its medium size and medium size is $\frac{8}{9}$ times of large size of its respective item.

31. What is the ratio between cost price of small size calculator to cost price of small size bat?
 (a) 3:4 (b) 2:3 (c) 1:3 (d) 1:2 (e) 3:5
32. Average cost price of all size of bat is how much percent more than M.R.P. of a book?
 (a) 10% less (b) 25% less (c) 25% more (d) 15% more (e) None of these.
33. If a large size calculator is sold at 10% profit, find difference between profit earned on selling such two calculators and 2 books?
 (a) Rs. 36 (b) Rs. 108 (c) Rs. 18 (d) Rs. 54 (e) Rs. 72
34. Cost price of a book is what percent of $\frac{5}{4}$ of cost price of a medium size bat?
 (a) 25% (b) 50% (c) 20% (d) 15% (e) 60%
35. If all large items are sold at 25% profit, find average profit earned on selling three large size calculator and 2 large bats?
 (a) 162 (b) 172 (c) 180 (d) 200 (e) 210

Directions (36-40): Dharam invest some amount in ICICI bank at 10% per annum at C.I. for two years and get Rs. 420 as total interest. If he withdrew his sum one year after from ICICI and invested in HDFC bank at R% per annum at C.I for two years, the sum would become Rs.3168. Rate of interest for SBI is 25% more than that of HDFC.

36. If amount invested in HDFC or SBI bank is equal to amount invested in ICICI initially, find ratio of simple interest earned in two years for HDFC to S.I. earned for SBI in two years?
 (a) 4:5 (b) 2:3 (c) 1:3 (d) 1:2 (e) None of these.
37. Rate of ICICI bank is how much percent more/less than rate of interest of HDFC bank?
 (a) 50% more (b) 25% more (c) 50% less (d) 25% less (e) 20% less
38. What is the difference between total amount incurred in two year from HDFC bank and ICICI bank at C.I.?
 (a) Rs. 608 (b) Rs. 748 (c) Rs. 760 (d) Rs. 560 (e) Rs. 768

39. If Rs. 5000 is invested for three years at rate of interest of ICICI, HDFC and SBI for 1st, 2nd and 3rd year respectively. Find total interest earned at simple interest?
 (a) Rs. 1500 (b) Rs. 3000 (c) Rs. 2075 (d) Rs. 2725 (e) Rs. 2750
40. What is the ratio between second year C.I. of ICICI and HDFC bank?
 (a) 5:11 (b) 7:13 (c) 2:5 (d) 5:12 (e) 12:13

Directions (41-45): Study the passage given below carefully and answer the following questions.

There are 5 persons – Deepak, Shivam, Dharam, Harish & Ankit. Amount of Deepak is 40% less than amount of Shivam. Amount of Dharam is equal to average of amount of Deepak and Shivam. Harish amount is Rs.3000 more than Shivam's amount. Ratio of amount of Ankit to that of Harish is 7 : 3 and Harish's amount is 137.5% of Dharam's amount.

41. If Ankit invested his amount in a scheme offering 20% p.a. at CI for 2 years, then find interest received by Ankit from the scheme.
 (a) Rs.13,200 (b) Rs.7,920 (c) Rs.33,880 (d) Rs.10,560 (e) Rs.14,520
42. If Shivam and Dharam invested their respective amounts in a partnership for 9 months and 12 months respectively and total profit after the end of 12 months is Rs.37200, then find profit share of Dharam.
 (a) Rs.21,600 (b) Rs.28,800 (c) Rs.24,000 (d) Rs.19,200 (e) Rs.12,800
43. If Harish invested his amount across two schemes for 3 years – one scheme offering 15% p.a. at SI and other one offering 18% p.a. at SI and he received total interest of Rs.16,650 from both schemes together, then find amount invested by Harish at 15% p.a.
 (a) Rs.13,000 (b) Rs.16,000 (c) Rs.15,000 (d) Rs.20,000 (e) Rs.11,000
44. If Deepak invested a fraction of his amount at 16% p.a. for 5 years at SI and total interest received by him from his investment is Rs.12,800, then find amount invested by Deepak is what percent of amount of Dharam?
 (a) 50% (b) $66\frac{2}{3}\%$ (c) 100% (d) $33\frac{1}{3}\%$ (e) None of the above.
45. Find average of amount of Deepak, Dharam, Shivam, Harish and Ankit.
 (a) Rs.38,000 (b) Rs.37,000 (c) Rs.37,600 (d) Rs.38,200 (e) Rs.36,400

Directions (46-50): Read the given information carefully and answer the following questions.

A boat covers certain distance in three parts i.e. upstream, downstream and in still water. Ratio of distance covered in downstream to upstream is 7:3 and total distance covered is 375 km. When boat goes downstream it consume 25% less fuel per km and while moving in upstream it consumes $12\frac{1}{2}\%$ more fuel per km than that of in still water and it cover 175km in still water. Now, after reaching its destination, boat returns to initial point covering the same path and it takes $\frac{10}{3}$ lit more fuel in return journey.

46. If in return journey boat takes 5hr 30 min more to cover upstream than downstream and speed of boat in downstream is 40km/h, then find speed of boat in upstream?
 (a) 10 km/h (b) 15 km/h (c) 20 km/h (d) 25 km/h (e) None of these.
47. How much fuel is consumed in covering downstream distance in whole journey? (approx.)
 (a) 15 lit (b) 17 lit (c) 18 lit (d) 12 lit (e) 10 lit
48. Total Distance covered in still water is how much percent more or less than total distance covered in upstream in whole journey?
 (a) 50% (b) 100% (c) 150% (d) 75% (e) 125%
49. What is the rate of consumption of fuel of boat in upstream?
 (a) 7 km in 1 lit (b) 8 km in 1 lit (c) 10 km in 1 lit (d) 12 km in 1 lit (e) 9 km in 1 lit
50. If fuel costs 81 rupee per liter, then find money spent on fuel to cover distance still water in return journey?
 (a) Rs. 1550 (b) Rs. 1575 (c) Rs. 1350 (d) Rs. 1275 (e) Rs. 1250

Directions (51-55): Study the following data carefully to answer the questions that follow:

There are 5 pipes (A,B,C,D,E) connected to a tank of capacity 60l in which pipe A and pipe E are emptying and the rest are filling the tank. The pipe A and pipe B are opened together then they can fill the tank in 30 hrs. The efficiency (magnitude only) of pipe D and pipe C is twice the efficiency of pipe B and pipe E respectively. The pipe B and pipe D together can fill the tank in $3\frac{1}{3}$ hrs and with the help of pipe C, they can fill the tank in $2\frac{1}{7}$ hr.

51. In how much time pipe A, B & C (opened simultaneously) can fill the tank completely if the tank is initially emptied? (in hrs)
 (a) none of these (b) 4.5 (c) 5.5 (d) 5 (e) 3.5
52. In how much time the emptying pipes (opened simultaneously) can empty the tank if the tank is initially half-filled?(in hrs)
 (a) $3\frac{1}{3}$ (b) $3\frac{2}{3}$ (c) $2\frac{1}{3}$ (d) $1\frac{1}{3}$ (e) $1\frac{2}{3}$
53. If pipe B doubles its efficiency then in how much time pipe A, B & D (opened simultaneously) can fill the empty tank completely? (in hrs)
 (a) 6 (b) 4 (c) $4\frac{2}{7}$ (d) 5 (e) 3
54. Find the difference between the time taken by pipe C & E together to fill the empty tank completely to time taken by pipe A & B together to fill $\frac{3}{4}$ th of the tank?(in hrs)
 (a) 10 (b) 10.5 (c) 12 (d) 14.5 (e) 14
55. Starting with Pipe A and following the sequence of opening ABCDE for one hour individually, then find in how much time the tank can be filled completely if tank is initially half filled.(in hrs)
 (a) $9\frac{3}{4}$ (b) $8\frac{1}{2}$ (c) $7\frac{9}{10}$ (d) $6\frac{7}{11}$ (e) $6\frac{2}{5}$

Directions (56-60): Read the given information carefully and answer the following questions.

There are five friends A, B, C, D and E. Ratio of monthly income of B to that of D is 4: 5 and that of A to E is 4: 3. When $33\frac{1}{3}\%$ of the monthly income of C is added to the total monthly income of A and E together it becomes equal to twice of monthly income of C. 25% of the total monthly income of A and B together is Rs 19,000 and average monthly income of all the friends is Rs 38,600. Saving of A is 50% of his income while expenditure of D is Rs 24,000. Expenditure of E is 75% of that of A.

56. Find the ratio of difference between monthly income of B and that of D to the difference between monthly expenditure of D and that of E.
 (a) 2 : 1 (b) 1 : 2 (c) 1 : 1 (d) 3 : 2 (e) 2 : 3
57. After a donation of $21\frac{3}{7}\%$ of the monthly income, ratio of expenditure to the saving of C is 9:13. Find difference between monthly saving and expenditure of C is what percent of the monthly income of E?
 (a) 25% (b) 20% (c) 22.5% (d) $33\frac{1}{3}\%$ (e) 17.5%
58. If saving of B and expenditure C is 47.5% and 55% of the monthly income of A respectively. Find the average of savings of A, B and C?
 (a) Rs $\frac{55000}{3}$ (b) Rs $\frac{56000}{3}$ (c) Rs $\frac{64000}{3}$ (d) Rs $\frac{61000}{3}$ (e) Rs $\frac{59000}{3}$
59. Each one spends 12.5% of his monthly income on clothing, then find total expenditure excluding expenditure on clothing of A, D and E?
 (a) Rs 42,825 (b) Rs 43,045 (c) Rs 42,025 (d) Rs 44,625 (e) Rs 43,915
60. Monthly income of C and D together is approximately what percent of the total monthly income of all the three remaining friends together?
 (a) 80% (b) 82% (c) 85% (d) 78% (e) 86%

Practice MCQs for Prelims_(Solutions)

Sol (1-5):

Let cost price of pen & book be Rs x & Rs y respectively.

$$\text{MP (pen)} = \frac{120}{100} \times x = \text{Rs } 1.2x$$

$$\text{SP (pen)} = \frac{108}{100} \times x = \text{Rs } 1.08x$$

$$\text{SP (book)} = \frac{112}{100} \times y = \text{Rs } 1.12y$$

$$\text{MP (book)} = \frac{100}{80} \times 1.12y = \text{Rs } 1.4y$$

$$x + y = 500 \dots\dots\dots (i)$$

$$(1.08x - x) + (1.12y - y) = \frac{10}{100} \times 1.4y = 0.14y$$

$$0.08x = 0.02y$$

$$x : y = 1 : 4 \dots\dots\dots (ii)$$

from (i) & (ii)

$$x = \text{Rs } 100,$$

$$y = \text{Rs } 400$$

	Pen	Book
CP (Rs)	100	400
MP (Rs)	120	560
SP (Rs)	108	448

1. (e): cost price of book = Rs 400

2. (b): required answer = $560 - 108 = \text{Rs } 452$

3. (c): required ratio = $108 : 448 = 27 : 112$

4. (a): required average = $\frac{120+560}{2} = 340$

5. (d): total CP = Rs 500

$$\text{Total SP (actual)} = 108 + 448 = \text{Rs } 556$$

$$\text{Actual gain \%} = \frac{556-500}{500} \times 100 = 11.2\%$$

$$\text{Total SP (when no discount was offered)} = 120 + 560 = \text{Rs } 680$$

$$\text{New gain \%} = \frac{680-500}{500} \times 100 = 36\%$$

$$\text{Required \%} = \frac{36-11.2}{11.2} \times 100 = 221.42\%$$

$$= 220\% (\text{Approx.})$$

Sol (6-10):

1 day work of Mahi = 1 day work of all three - 1 day work Chiku & Gabbar

$$\frac{2}{x} - \frac{1}{7.5} = \frac{1}{x+5}$$

$$2x^2 + 10x = 15x + 150$$

$$x = 10 \text{ \& -7.5 (neglecting negative value)}$$

$$x = 10 \text{ days (time taken by Chiku)}$$

$$\text{Time taken by Mahi} = x + 5 = 15 \text{ days}$$

$$1 \text{ day work of Gabbar} = \frac{1}{7.5} - \frac{1}{x} = \frac{1}{30} \text{ units}$$

	Time (days)	Work (units)	Efficiency (units/day)
Chiku	10	60	6
Mahi	15	60	4
Gabbar	30	60	2

6. (b): required time = 30 days

$$7. (e): Y = 10^3 - 10(10)^2 + 12(10) - 12 = 120 - 12 = 108$$

8. (c): required ratio = $\frac{60}{6+4} : \frac{60}{4} = 2 : 5$

9. (d): time taken by Chiku & Gabbar to finish double the

$$\text{work} = \frac{120}{6+2} = 15 \text{ days}$$

$$\text{Required \%} = \frac{15}{15} \times 100 = 100\%$$

10. (a): work completed in 6 days = $6 \times 1 + 4 \times 2 + 2 \times 3 = 20 \text{ units}$

$$\text{Time required} = \frac{6}{20} \times 60 = 18 \text{ days}$$

Sol. (11-15): Let the CP of AC be Rs. 100x

Then, CP of washing machine be Rs. 80x.

CP of TV = Rs. 75x

ATQ,

$$100x + 80x + 75x = 51,000$$

$$\Rightarrow 255x = 51,000$$

$$\Rightarrow x = 200.$$

Articles	TV	Washing Machine	AC
CP	15,000	16,000	20,000
SP	17,700	21,600	24,500

11. (b): Required average = $\frac{17,700+24,500}{2} = \text{Rs. } 21,100$

12. (d): Total profit earned on selling TV and AC

$$= 2700 + 4500 = \text{Rs. } 7200$$

Profit earned on selling washing machine = 5600

$$\text{Required \%} = \frac{7200-5600}{5600} \times 100\%$$

$$= \frac{200}{7} \% = 28 \frac{4}{7} \%$$

13. (a): Marked price of AC = $\frac{24500}{80} \times 100 = \text{Rs. } 30,625$

$$\text{Required \%} = \frac{30,625-20,000}{20,000} \times 100\%$$

$$= \frac{425}{8} \% = 53 \frac{1}{8} \%$$

14. (c): Total profit = Rs. $(17,700-15,000) + (21,600-16,000) + (24,500-20,000)$
= Rs. 12,800.

15. (e): Cost price of Laptop = $\frac{215}{100} \times 21,600 = \text{Rs. } 46,440$

$$\text{Required difference} = 51,000 - 46,440 = \text{Rs. } 4560$$

Sol (16-20):

No. of mobiles = $x - 9$

No. of laptops = $x - 9 + 4 = x - 5$

Let M.R.P. of each chair and table = Rs. 6a

$$\text{Cost of a chair} = 6a \times \frac{5}{6} = \text{Rs. } 5a$$

$$\text{Cost of a table} = 6a \times \frac{2}{3} = \text{Rs. } 4a$$

ATQ

$$4aY - 5aX = 200 \dots \dots (i)$$

Let cost of a mobile = Rs. m

ATQ

$$2m \times 133\frac{1}{3}\% = 8000$$

$$2m \times \frac{4}{3} = 8000$$

$$m = \text{Rs. } 3000$$

$$\text{And } (X - 9) \times 3000 + (X - 5) \times 8000 = 65000$$

$$11000X = 132000$$

$$X = 12$$

$$\text{No. of laptop} = 12 - 5 = 7$$

$$\text{Now, } 4a \times \frac{3.5}{100} = 7$$

$$a = 50$$

Put $a = 50$ and $X = 12$ in equations (i)

$$4 \times 50 \times Y - 5 \times 50 \times 12 = 200$$

$$200Y = 3200$$

$$Y = 16$$

$$16. (d): \text{MRP for a mobile} = \frac{3000}{60} \times 100 = \text{Rs. } 5000$$

$$\text{MRP for a laptop} = \frac{8000}{8} \times 9 = \text{Rs. } 9000$$

$$\text{Required difference} = 9000 - 5000 = \text{Rs. } 4000$$

17. (a): required amount

$$= 10 \times 250 + 8 \times 200 = \text{Rs. } 4100$$

$$18. (b): \text{required percentage} = \frac{7-3}{3} \times 100 = 133.33\%$$

19. (c): total amount spent on purchasing all items

$$= 12 \times 250 + 16 \times 200 + 3 \times 3000 + 7 \times 8000$$

$$= \text{Rs. } 71200$$

$$\text{Required average} = \frac{71200}{12+16+3+7} \approx \text{Rs. } 1874$$

20. (a): let efficiency of a man and a woman is M and W respectively

ATQ

$$X \times M \times 2 = Y \times W \times 4$$

$$12 \times M \times 2 = 16 \times W \times 4$$

$$M:W = 8:3$$

Sol (21-25):Let the present age of Aayush be $5x$ yearsSum of present age of Vivek and Vikash = $5x$ years

And sum of present age of Sneha and Neha

$$= 5x \times \frac{100}{125} = 4x \text{ years}$$

Let the present age of Sneha be y yearsThen the present age of Vikash = $(y+20)$ yearsPresent age of Neha = $(y+16)$ years

ATQ

$$y + 16 + y = 4x$$

$$y = 2x - 8 \dots \dots (i)$$

Present age of Vivek = $5x - (y+20) = (3x-12)$ years.....
using (i)

And

$$\frac{5x-10}{3x-12-10} = \frac{3}{1}$$

$$x = 14$$

Present age of Aayush = 70 years

Present age of Sneha = 20 years

Present age of Neha = 36 years

Present age of Vivek = 30 years

Present age of Vikash = 40 years

$$21. (c): \text{Required ratio} = \frac{36+4}{30+10} = \frac{40}{40} = 1:1$$

$$22. (e): \text{Required average} = \frac{70+20+36+30+40}{5} = \frac{196}{5} = 39.2 \text{ yrs}$$

23. (a): Required difference

$$= (30 + 40) - (20 + 36) = 14 \text{ yrs}$$

24. (b): Difference = $40 - 20 = 20$ yrs

$$\text{Required } \% = \frac{20}{36} \times 100 = \frac{500}{9} \% = 55\frac{5}{9} \%$$

25. (d): Let the present age of his wife be z years

Atq,

$$\frac{z-4}{40-4} = \frac{5}{3} \Rightarrow z = 64 \text{ yrs}$$

$$\text{Required difference} = 6 \text{ yrs}$$

Sol (26-30):let cost price of article B, C and E = Rs. $7x$, $6x$ and $9x$ respectivelyCost price of article D = $43200 - 8160 - 22x$

$$= \text{Rs. } 35040 - 22x$$

ATQ

$$\frac{(35040-22x)1.15}{9x \times 1.20} = \frac{23}{30}$$

$$175200 - 110x = 36x$$

$$146x = 175200$$

$$x = 1200$$

Cost price of article B = $1200 \times 7 = \text{Rs. } 8400$ Cost price of article C = $1200 \times 6 = \text{Rs. } 7200$ Cost price of article D = $35040 - 1200 \times 22 = \text{Rs. } 8640$ Cost price of article E = $1200 \times 9 = \text{Rs. } 10800$ Selling price of article A = $8160 \times 1.1 = \text{Rs. } 8976$ Selling price of article B = $8400 \times 0.85 = \text{Rs. } 7140$ Selling price of article C = $7200 \times 0.78 = \text{Rs. } 5616$ Selling price of article D = $8640 \times 1.15 = \text{Rs. } 9936$ Selling price of article E = $10800 \times 1.2 = \text{Rs. } 12960$

$$26. (b): \text{required ratio} = (8976 + 7140) : (7200 + 8640) = 1343 : 1320$$

$$27. (d): \text{loss incurred on article B} = 8400 \times \frac{15}{100} = \text{Rs. } 1260$$

Profit earned on article E

$$= 10800 \times \frac{20}{100} = \text{Rs. } 2160$$

$$\text{Required difference} = 2160 - 1260 = \text{Rs. } 900$$

68. (a): new selling price of article C

$$= 7200 \times 1.17 = \text{Rs. } 8424$$

$$\text{Required percentage} = \frac{8424-5616}{5616} \times 100 = 50\%$$

29. (e): maximum selling price is of article E = Rs. 12960
Second minimum cost price is of article A = Rs. 8160

$$\text{Required part} = \frac{12960-8160}{7200} \\ = \frac{4800}{7200} = \frac{2}{3}$$

30. (b): M.R.P. of article B = Rs. 13440

$$\text{New S.P. of article of B} = \frac{13440}{100} \times 75 = \text{Rs. } 10080$$

$$\text{Profit} = 10080 - 8400 = \text{Rs. } 1680$$

$$\text{Loss} = 8400 \times \frac{15}{100} = 1260$$

$$\text{Required difference} = 1680 - 1260 = \text{Rs. } 420$$

31. (b): required ratio = $\frac{360}{540} = 2 : 3$

32. (d): average cost price of all size of bat
 $= \frac{540+720+810}{3} = \text{Rs. } 690$

Required percentage

$$= \frac{690-600}{600} \times 100 = 15\% \text{ more}$$

33. (e): profit earned on a large size calculator

$$= 540 \times \frac{10}{100} = \text{Rs. } 54$$

$$\text{Profit earned on a book} = 540 - 450 = \text{Rs. } 90$$

$$\text{Required difference} = 2 \times 90 - 2 \times 54 = \text{Rs. } 72$$

34. (b): required percentage = $\frac{450}{720 \times \frac{5}{4}} \times 100 = 50\%$

35. (a): required average = $\frac{540 \times \frac{25}{100} \times 3 + 810 \times \frac{25}{100} \times 2}{3+2}$
 $= \frac{405+405}{5} = 162$

Sol (36-40):

For ICICI bank

Let sum invested in ICICI bank = Rs. P

$$\text{Equivalent rate of interest for } 10\% \text{ at C.I. for two years} \\ = 10 + 10 + \frac{10 \times 10}{100} = 21\%$$

ATQ

$$P \times \frac{21}{100} = 420$$

$$P = \text{Rs. } 2000$$

For HDFC bank

Sum invested in HDFC bank at R% per annum

$$= 2000 + 2000 \times \frac{10}{100} = \text{Rs. } 2200$$

ATQ

$$3168 = 2200 \left(1 + \frac{R}{100}\right)^2$$

$$\frac{3168}{2200} = \left(1 + \frac{R}{100}\right)^2$$

$$\sqrt{\frac{36}{25}} = 1 + \frac{R}{100}$$

$$\frac{6}{5} - 1 = \frac{R}{100}$$

$$R = 20$$

Rate = 20% per annum

For SBI bank

$$\text{Rate percent} = 20 \times \frac{125}{100} = 25\% \text{ per annum}$$

36. (a): required ratio = $2000 \times 2 \times \frac{20}{100} : 2000 \times 2 \times \frac{25}{100}$
 $= 4:5$

37. (c): required percentage = $\frac{20-10}{20} \times 100 = 50\% \text{ less}$

38. (b): amount incurred from ICICI bank in two years =
 $2000 \times \frac{110}{100} \times \frac{110}{100} = \text{Rs. } 2420$

$$\text{Required difference} = 3168 - 2420 = \text{Rs. } 748$$

39. (e): required interest = $5000 \times \frac{10+20+25}{100} = \text{Rs. } 2750$

40. (d): first year interest of ICICI bank = $2000 \times \frac{10}{100} =$
Rs. 200

Second year C.I. for ICICI bank

$$= 200 \times \frac{110}{100} = \text{Rs. } 220$$

First year interest for HDFC

$$= 2200 \times \frac{20}{100} = \text{Rs. } 440$$

$$\text{Second year C.I. for HDFC} = 440 \times \frac{120}{100} = \text{Rs. } 528$$

$$\text{Required ratio} = 220:528 = 5:12$$

Sol (41-45):

Let amount of Shivam be Rs. 5x.

$$\text{So, amount of Deepak} = 5x \times \frac{60}{100} = \text{Rs. } 3x$$

$$\text{Now, amount of Dharam} = \frac{3x+5x}{2} = \text{Rs. } 4x$$

$$\text{And, amount of Harish} = \frac{137.5}{100} \times 4x = \text{Rs. } 5.5x$$

$$\text{Now, amount of Ankit} = 5.5x \times \frac{7}{3} = \text{Rs. } \frac{38.5x}{3}$$

ATQ,

$$5.5x - 5x = 3000$$

$$x = 6000$$

Persons	Amount (in Rs.)
Deepak	18,000
Shivam	30,000
Dharam	24,000
Harish	33,000
Ankit	77,000

41. (c): Required interest = $77000 \left(\left(1 + \frac{20}{100}\right)^2 - 1 \right)$
 $= \text{Rs. } 33,880$

42. (d): Profit sharing ratio of Shivam and Dharam
 $= (30000 \times 9) : (24000 \times 12)$
 $= 15 : 16$

$$\text{Required profit share} = 37200 \times \frac{16}{16+15} \\ = \text{Rs. } 19,200$$

43. (a): Let amount invested by Harish at 15% p.a. be Rs. x.
So, amount invested by Harish at 18% p.a. =
Rs. (33,000 - x)

ATQ,

$$\frac{x \times 15 \times 3}{100} + \frac{(33,000 - x) \times 18 \times 3}{100} = 16,650$$

$$\Rightarrow x = 13,000$$

$$\text{Hence, required amount} = \text{Rs. } 13,000$$

44. (b): Let Deepak invested Rs.x.

ATQ,

$$\frac{x \times 16 \times 5}{100} = 12,800$$

$$\Rightarrow x = 16,000$$

$$\text{Required \%} = \frac{16,000}{24,000} \times 100$$

$$= 66\frac{2}{3}\%$$

45. (e): Required average

$$= \frac{18,000 + 24,000 + 30,000 + 33,000 + 77,000}{5}$$

$$= \frac{1,82,000}{5} = \text{Rs.}36,400$$

Sol (46-50):

Distance covered in still water between initial point and destination point = 175 km

Distance covered in upstream between initial point and destination point = $\frac{375-175}{10} \times 3 = 60\text{ km}$

Distance covered in downstream between initial point and destination point = $200 - 60 = 140$

Let fuel consumption in still water = $8x$ lit per km

Then, fuel consumption in upstream

$$= 8x \times \frac{9}{8} = 9x \text{ lit per km}$$

And fuel consumption in downstream

$$= 8x \times \frac{75}{100} = 6x \text{ lit per km}$$

ATQ

In return journey downstream distance will become upstream distance and vice-versa

$$175 \times 8x + 140 \times 9x + 60 \times 6x - 175 \times 8x - 140 \times$$

$$6x - 60 \times 9x = \frac{10}{3}$$

$$1620x - 1380x = \frac{10}{3}$$

$$x = \frac{1}{72}$$

46. (c): In return journey downstream distance will become upstream distance and vice-versa

Let speed of boat in upstream = S km/h

ATQ

$$\frac{140}{S} - \frac{60}{40} = \frac{11}{2}$$

$$\frac{140}{S} = 7$$

$$S = 20 \text{ km/h}$$

47. (b): total distance covered in downstream = $140 + 60 = 200\text{ km}$

$$\text{Rate of fuel consumption} = 6x = 6 \times \frac{1}{72} = \frac{1}{12}$$

$$\text{Fuel required} = \frac{200}{12} = 16.67 \approx 17 \text{ lit.}$$

48. (d): total distance covered in still water = $175 + 175 = 350\text{ km}$

Total distance covered in upstream = $140 + 60 = 200\text{ km}$

$$\text{Required percentage} = \frac{350-200}{200} \times 100 = 75\%$$

49. (b): rate of fuel consumption in upstream

$$= 9x = 9 \times \frac{1}{72} = \frac{1}{8}$$

8 km in 1 lit

50. (b): distance covered in still water in return journey = 175 km

$$\text{Required sum} = 175 \times 8 \times \frac{1}{72} \times 81 = \text{Rs.}1575$$

Sol (51-55):

Let the efficiency of pipes A, B, C, D & E be 'a', 'b', 'c', 'd' & 'e' (l/hrs) respectively

Then ATQ

$$a + b = \frac{60}{30} = 2 \frac{\text{l}}{\text{hrs}} \dots \dots (i)$$

$$\text{Given } 2b = d; 2e = c$$

$$b + d = 60 \times \frac{3}{10} = 18 \frac{\text{l}}{\text{hrs}}$$

$$3b = 18$$

$$b = 6 \frac{\text{l}}{\text{hrs}}$$

$$\text{So } d = 12 \frac{\text{l}}{\text{hr}}$$

$$\text{Again } b + d + c = 60 \times \frac{7}{15} = 28 \frac{\text{l}}{\text{hrs}};$$

$$c = 10 \frac{\text{l}}{\text{hr}}$$

Since pipe E is emptying the tank so $e = -5 \frac{\text{l}}{\text{hrs}}$

Putting the value of b in eq (i) we get a

$$= -4 \frac{\text{l}}{\text{hrs}} \text{ (since pipe A is emptying pipe)}$$

$$\textbf{51. (d):} \text{ Required time} = \frac{60}{10+6-4} = 5 \text{ hrs.}$$

$$\textbf{52. (a):} \text{ Required time} = \frac{30}{-4-5} = 3\frac{1}{3} \text{ hrs (negative signs for emptying pipes)}$$

53. (e): Given pipe B doubles its efficiency

$$\text{So } b = 12 \frac{\text{l}}{\text{hrs}}$$

$$\text{Required time} = \frac{60}{12+12-4} = 3 \text{ hrs}$$

54. (b): Time taken by pipe A & B together to fill $\frac{3}{4}$ th of the

$$\text{tank} = \frac{3 \times \frac{60}{4}}{6-4} = 22.5 \text{ hrs}$$

Time taken by pipe C & E together to fill the empty

$$\text{tank} = \frac{60}{10-5} = 12 \text{ hrs}$$

$$\text{Required difference} = (22.5 - 12) \text{ hrs} = 10.5 \text{ hrs}$$

55. (c): Given the tank is initially half filled (30l is already filled)

In 1 hr Pipe A can empty 4 l

In 1 hr Pipe B can fill 6 l

In 1 hr Pipe C can fill 10 l

In 1 hr Pipe D can fill 12 l

In 1 hr Pipe E can empty 5 l

Following the sequence the tank get filled by 19 l at the end of first 5 hrs

$$\text{In 6th hour} = -4\text{l} \Rightarrow 19 - 4 = 15\text{l filled}$$

$$\text{In 7th hour} = +6\text{l} \Rightarrow 15 + 6 = 21\text{l}$$

$$\text{Remaining 9 l filled by C in } \frac{9}{10} \text{ hr}$$

$$\text{Total time} = 5 + 1 + 1 + \frac{9}{10} = 7\frac{9}{10} \text{ hr}$$

Sol (56-60):

Let monthly income of B and D be Rs $4x$ and Rs $5x$ respectively and that of C be Rs z .

And let the monthly income of A and E be Rs $4y$ and Rs $3y$ respectively

ATQ

$$2z = \frac{1}{3}z + (4y + 3y)$$

$$z = \frac{21}{5}y$$

$$\text{and, } \frac{1}{4}(4x + 4y) = 19000$$

$$(x + y) = 19000 \dots\dots\dots (i)$$

Now,

$$4x + 4y + \frac{21}{5}y + 5x + 3y = 1,93,000$$

$$4(x + y) + 3(x + y) + 2(x + y) + \frac{11}{5}y = 1,93,000 \dots\dots\dots (ii)$$

From (i) and (ii),

$$y = 10,000$$

$$\text{and } x = 9000$$

Person	Income	Saving	Expenditure
A	40,000	20,000	20,000
B	36,000		
C	42,000		
D	45,000	21,000	24,000
E	30,000	15,000	15,000

$$56. (c): \text{Required ratio} = \frac{(45,000 - 36,000)}{(24,000 - 15,000)} = 1:1$$

$$57. (b): \text{Remaining amount of C after a donation} = 42000 \times \frac{11}{14} = \text{Rs } 33000$$

$$\text{Difference between expenditure and saving of C} = \frac{4}{22} \times 33000 = \text{Rs } 6000$$

$$\text{Required \%} = \frac{6000}{30000} \times 100 = 20\%$$

$$58. (e): \text{Saving of A} = \text{Rs } 20,000$$

$$\text{Saving of B} = \text{Rs } 19,000$$

$$\text{Saving of C} = \text{Rs } 20,000$$

$$\text{Required average} = \text{Rs } \frac{59000}{3}$$

$$59. (d): \text{Expenditure of A (excluding clothing expenditure)} = 20,000 - \frac{1}{8} \times 40,000 = \text{Rs } 15,000$$

$$\text{Expenditure of D (excluding clothing expenditure)} = 24,000 - \frac{1}{8} \times 45,000 = \text{Rs } 18,375$$

$$\text{Expenditure of E (excluding clothing expenditure)} = 15,000 - \frac{1}{8} \times 30,000 = \text{Rs } 11,250$$

$$\text{Required total expenditure} = \text{Rs } 44,625$$

$$60. (b): \text{Total monthly income of A, B and E together} = \text{Rs } 1,06,000$$

$$\text{Total monthly income of C and D together} = \text{Rs } 87,000$$

$$\text{Required \%} = \frac{87,000}{1,06,000} \times 100 = 82\%$$

Practice MCQs for Mains

Directions (1 – 3): A bridge 'AB' has a single railway track spanning its entire width. A dog is standing on the bridge 20 m away from the center of the bridge towards A. The dog sees a train coming at a constant speed of 72 km/hr. The distance of the train (assumed as a point object) from the nearer end (point A) of the bridge is twice the length of the bridge. If the dog runs towards the train at a constant speed, it will get off the bridge safely when the train is still 50 m away from the bridge. If it runs away from the train at the same constant speed, the train will hit it when it is still 12.5 m from the end of the bridge. A cow is also standing on the same bridge at a distance 'd' from point A. Length of bridge AB is an integral value.

- What would be value of 'd' (in m) in which train hit the cow at A, if it starts running (with the same speed of dog) towards the train?
(a) 20 (b) 30 (c) 40 (d) 50 (e) 60
- Length of 'AB'?
(a) 100 m (b) 120 m (c) 150 m (d) 200 m (e) None of these
- If 160 meters long train running with speed of 108 km/hr crosses a tunnel in $13\frac{1}{3}$ sec, then find length of tunnel?
(a) 200 m (b) 220 m (c) 240 m (d) 280 m (e) None of these

Directions (4 – 8): Read the following information carefully and answer the questions.

x women can complete a piece of work in $2y$ days. $1.5x$ men can complete the same work in y days while $2x$ children can complete the same work in $3y$ days. 8 women, 8 children and 8 men together can complete a work in $22\frac{1}{2}$ days. 9 men can complete the same work in $(y + 20)$ days.

- What is the value of y .
(a) 14 (b) 18 (c) 20 (d) 16 (e) 24

5. If 36 women started the work and after 4 days 30 women are replaced by 8 men then, find the total time in which work will be completed.
 (a) $20\frac{4}{25}$ days (b) $22\frac{3}{25}$ days (c) 12 days (d) 12.5 days (e) $24\frac{4}{25}$ days
6. Find the value of x.
 (a) 12 (b) 14 (c) 10 (d) 15 (e) 11
7. When 8 women, 8 children and 8 men work together and completed the work than what percentage of total work is completed by children.
 (a) 16% (b) 10% (c) 15% (d) 8.33% (e) 12.5%
8. (x – 6) women worked for (y – 6) days and (x – 6) man worked for (y – 10) days then in what time remaining work will be completed by (x – 6) children
 (a) $152\frac{2}{3}$ days (b) $148\frac{1}{3}$ days (c) 145 days (d) 154 days (e) 158 days

Directions (9-13): Read the given information carefully and answer the following questions.

Arun & Veer invested Rs. 60,000 and Rs. 90,000 respectively. Arun invested for 15 months while Veer invested for 8 months and the difference between profit share of Arun and Veer is Rs.10000. Arun invested his profit share at 20% p.a on CI for 1.5 years and he bought a bike from the amount he received. Veer bought two laptops L_1 & L_2 (both laptops have equal price) from the amount which he received after investing his profit share at 15% p.a on SI for 2 years. Veer sold L_1 & L_2 at 10% and 15% profit respectively while Arun sold his bike at 5% loss.

9. Veer invested money (which he gets from the profit of that two laptops) in a scheme at the rate of 10% p.a on simple interest for 4 years. What is the interest he received?
 (a) Rs. 2800 (b) Rs. 2600 (c) Rs. 2500 (d) Rs. 2750 (e) Rs. 3000
10. If the price of Bike depreciates 15% every year, then what will be the price of bike after 2 years?
 (a) Rs. 47,685 (b) Rs. 49,675 (c) Rs. 48,025 (d) Rs. 47,515 (e) Rs. 48,195
11. If the marked price of laptop L_1 is 40% more than its cost price and the selling price of L_1 is Rs. 2600 more than its earlier selling price, then what is the discount percentage given on L_1 ?
 (a) $8\frac{4}{7}\%$ (b) $11\frac{3}{7}\%$ (c) 10% (d) $14\frac{2}{7}\%$ (e) $7\frac{9}{13}\%$
12. The total amount received by Arun on selling that bike and the total amount received by veer on selling both the laptops together is how much more or less than the 108% of total cost price of all the three items together?
 (a) Rs. 6040 (b) Rs. 6180 (c) Rs. 6240 (d) Rs. 6340 (e) Rs. 6380
13. In the above passage, if the difference between profit share of Arun and Veer is Rs. 11000 instead of Rs. 10000, then what will be the change in the net profit earned on all the three items together? (Rest all information remains same)
 (a) Rs. 120 (b) Rs. 320 (c) Rs. 220 (d) Rs. 520 (e) Rs. 420

Direction (14-18): Read the data carefully and answer the questions.

On Sunday, daily passengers traveling from Delhi to Lucknow increased by '2R%' as compared to other days of week and difference between passengers traveling from Delhi to Lucknow on Sunday and other days of week is 960. If number of passengers traveling from Delhi to Lucknow on Sunday decreased by 'R' %, then difference between passengers traveling from Delhi to Lucknow on Sunday now and passengers travelling from Delhi to Lucknow on Sunday earlier is Rs. 624. Each passenger traveling from Delhi to Lucknow on other days of week likes either tea or coffee or both. (55% of passengers like coffee and 70% passengers like tea).

14. Find value of 6R%
 (a) 120% (b) 60% (c) 75% (d) 90% (e) None of these
15. Find number of passengers travelling from Delhi to Lucknow on other days of week who like either coffee or tea but not both?
 (a) 1920 (b) 2400 (c) 2000 (d) 1600 (e) 2080
16. If Rs. 3600 invested for two years at the rate of R% p.a. on CI compounding annually, then find amount received after two years?
 (a) 4761 Rs. (b) 4741 Rs. (c) 4361 Rs. (d) 4961 Rs. (e) 4785 Rs.

17. If 37.5% passengers traveling from Delhi to Lucknow on Sunday belongs to rural area, then find number of passengers traveling from Delhi to Lucknow on Sunday belongs to urban area?
 (a) 1920 (b) 2600 (c) 2000 (d) 1600 (e) 2080
18. Find the difference between passengers travelling from Delhi to Lucknow on other days of week who like only tea and who like only coffee?
 (a) 360 (b) 400 (c) 620 (d) 550 (e) 480

Direction (19 – 23): Read the data carefully and answer the questions.

Anurag invested Rs. (P) at the rate of (R)% for four years and get Rs. 600 as interest. Anurag by investing all the amount he received in a business with Ayush, who invested capital of Rs. 64R (Ratio for time period for Anurag & Ayush invested is 3 : 4) and Ayush gets total Rs. 3200 as profit share out of total profit of Rs. 8600. Veer sold an article at Rs. 72R after allowing a discount of (d)% on its marked price (M), instead of (M), if allowed same discount on (P), then he sold the article at 80R and made a profit of $33\frac{1}{3}\%$.

19. Find the value of $(12R + 3P)$?
 (a) 4950 (b) 4450 (c) 2750 (d) 3250 (e) 3750
20. Find value of d% of $(566 + 1234)$?
 (a) 300 (b) 200 (c) 250 (d) 275 (e) 240
21. In the given question, two quantities are given, one as 'Quantity I' and another as 'Quantity II'. You have to determine relationship between two quantities and choose the appropriate option:
Quantity I – 300% of M
Quantity II – 270% of P
 (a) Quantity I \geq Quantity II (b) Quantity I = Quantity II or No relation
 (c) Quantity I > Quantity II (d) Quantity I < Quantity II
 (e) Quantity I \leq Quantity II
22. Find the value of $\frac{M}{R}$?
 (a) 84.5 (b) 88.5 (c) 86.4 (d) 90.6 (e) 80.4
23. If selling price of an article is Rs. (M + P) after allowing two successive discounts on Rs. 3800 of 'X%' and $(X - 5)\%$, then find value of 2X? (some profit is earned on selling)
 (a) 40 (b) 50 (c) 25 (d) 30 (e) None of these

Directions (24 – 28): Read the given information carefully and answer the questions.

There are 10 red balls and X yellow balls in a bag. When two balls are drawn from the bag without replacement, then probability of getting at least one yellow ball is $\frac{29}{38}$. Veer invested Rs 100X in a scheme offering simple interest at 18% p.a. After 3 years, Veer gifted Y% of what he received in total from the scheme to Ayush which he distributed between Anurag & Amit in ratio $(X + Y) : X$ respectively. Amount received by Amit is Rs 110. Amit mixed Y lit of pure milk with 40 lit of water from which Deepak took Z lit of mixture, due to which Amit is left with $(Y - X)$ lit of milk.

24. which of the following is true?
 (a) $X < Y < Z$ (b) $X < Y > Z$ (c) $X > Y > Z$ (d) $X > Y < Z$ (e) $X = Y = Z$
25. If Veer has gifted all the amount he received from the scheme to Ayush and Ayush further distributed it in ratio of 7 : 4 to Anurag & Amit respectively, then how much Amit would have received more?
 (a) Rs 320 (b) Rs 340 (c) Rs 220 (d) Rs 450 (e) Rs 420
26. What is difference between quantity of milk & water in the mixture Deepak has?
 (a) 2 lit (b) 4 lit (c) 0 lit (d) 6 lit (e) 8 lit
27. If Amit replaced quantity of mixture taken by Deepak with equal quantity of milk, then what is ratio of milk to water in the mixture that Amit has after replacement?
 (a) 59 : 31 (b) none of these (c) 17 : 10 (d) 4 : 5 (e) 29 : 16

28. Quantity I: in how many ways can 3 yellow balls be picked from the bag, when 3 balls are drawn from the bag?

Quantity II: Numerical value of $\frac{XYZ}{X+Y+Z}$.

- (a) Quantity I < Quantity II
(b) Quantity I = Quantity II or no relation
(c) Quantity I > Quantity II
(d) Quantity I \geq Quantity II
(e) Quantity I \leq Quantity II

Direction (29-32): Read the data carefully and answer the questions.

The following data given about sales and revenue of two stationary shops P & Q and both shops sold only two types of pen gel & dot.

Shop P – Cost price of per unit gel pen was Rs. 36 per units and revenue generated on selling per units at Rs. 48 was Rs. 3600. Profit made on selling of gel pen was Rs. 360. Cost of per unit of dot pen was $22\frac{2}{9}\%$ more than per unit cost price of gel pen. Profit on selling 60% of total dot pens was Rs. 480 and thereby making a profit of $22\frac{8}{11}\%$.

Shop Q – The ratio of gel pens P to Q is 5 : 4 and Profits made on selling all the units is 180%. Profit made on selling all 64 units of dot pens at the rate of Rs. 90 per units was Rs. 960. Profit made on the selling all gel pens was 125% more than that of profit made on selling all dot pens.

29. Number of unsold gel pen by P is what percent of number of unsold dot pen by P?

- (a) $42\frac{7}{8}\%$ (b) $40\frac{7}{8}\%$ (c) $41\frac{7}{8}\%$ (d) $46\frac{7}{8}\%$ (e) $44\frac{7}{8}\%$

30. Find the ratio of selling price of per unit Dot pen for P to selling price of per unit gel pen for Q?

- (a) 81 : 70 (b) 81 : 68 (c) 81 : 64 (d) 18 : 74 (e) None of these

31. If shop Q sold all dot pens at 60% profit, then find total profit of shop Q on selling dot pens?

- (a) 1240 Rs. (b) 1620 Rs. (c) 1400 Rs. (d) 1520 Rs. (e) 2880 Rs.

32. Number of unsold gel pen by shop P is what percent less than number of unsold dot pens by P?

- (a) 44.175% (b) 53.125% (c) 42.75% (d) 46.75% (e) 40.75%

Direction (33-37): Read the data carefully and answer the question.

There are three sitting halls, three pantry, three meeting rooms and one HR & one CEO room in the office of Adda247. All halls, pantry, meeting rooms, HR room & CEO rooms are rectangular in shape and area of each hall is same, each pantry is same, each meeting room is same and area is different for HR & CEO room.

Breadth of hall & pantry are 33 m & 15 m respectively, while ratio of length of hall to that of pantry is 22 : 7. The difference between perimeter of a hall & a pantry is 126 m, while area of a meeting room having breadth of 14 m is 77 m² less than that of area of a pantry room. Ratio of magnitude of perimeter of HR room to area of that room is 19 : 88 and breadth of that room is 16 m. Length & breadth of CEO room is 4 m & 2 m more than that of length and breadth of HR room respectively. (Consider only 2D figure)

33. The radius of a cylindrical vessel is equal to half of the length of a pantry. Its volume is 4158 m³ and cost of polishing it is Rs. 5 per m², then find the total cost of polishing the vessel including its top and bottom surfaces.

- (a) 7225 Rs. (b) 7425 Rs. (c) 7050 Rs. (d) 7825 Rs. (e) 7625 Rs.

34. The ratio of radius of two circular parks is 5: 6 and sum of circumference of both circular parks is 154m more than perimeter of a CEO room. If cost of fencing per meter with wire is Rs. 25, then find the total cost of fencing the smaller circular park?

- (a) 2560 Rs. (b) 2456 Rs. (c) 2226 Rs. (d) 2288 Rs. (e) 2750 Rs.

35. Total perimeter of a meeting room and a hall is what percent of area of a CEO room (consider only its numerical value)?

- (a) 50% (b) $52\frac{2}{9}\%$ (c) $53\frac{8}{9}\%$ (d) $55\frac{5}{9}\%$ (e) $57\frac{2}{9}\%$

36. All three meeting rooms are rebuilt so that breadth of each meeting room is increased by 100% and length is decreased by 10 m. If each meeting room is divided into four square cabins and decorated with wood which costs Rs 12.5 per/m², then find the total cost of decoration of all square cabins built in the three meeting rooms ?

- (a) 7290 Rs. (b) 7230 Rs. (c) 7240 Rs. (d) 7350 Rs. (e) 7560 Rs.

37. Find the difference between perimeter of a HR room & perimeter of a pantry?

- (a) 4 m (b) 8 m (c) 12 m (d) 16 m (e) 18 m

Directions (38-42): Read the information carefully and answer the following questions.

Persons X, Y and Z wish to go from place A to place B, which are separated by a distance of 70 km. All the three persons start off together from A, with X and Y going by bike at a speed of 20 kmph. X drops Y somewhere along the way and return to pick up Z, who has already started walking towards B at a speed of 5 kmph. Y, after being dropped by X starts walking towards B at a speed of 5 kmph. In this manner, all three of them reach B at the same time.

38. How much distance is covered by Z on foot?

- (a) 15 km (b) 10 km (c) 12.5 km (d) 17.5 km (e) None of these

39. After how much time is Y dropped on the way by X?

- (a) 2 hr (b) 2.5 hr (c) 3 hr (d) 3.5 hr (e) $3\frac{1}{3}$ hr

40. Find the distance from B where X meets Z while X was going to pick Z?

- (a) 36 km (b) 40 km (c) 45 km (d) 30 km (e) None of these

41. Find the distance covered by Y in the time when X meets Z in order to pick him?

- (a) 7.2 km (b) 6 km (c) 8 km (d) 7.5 km (e) 9 km

42. Find the total time taken by Z to reach point B?

- (a) 6 hr (b) 7.5 hr (c) 6.5 hr (d) 8 hr (e) 5.5 hr

Directions (43-47): Study the given information carefully and answer the following questions.

The premises of an office are to be renovated in terms of flooring and painting the walls and ceiling. All rooms/halls/pantry are rectangular in shape. Some areas are to be floored with wood flooring while rest with marble. All painting work is to be done with Royal paint. The size of office is 40 m by 40 m. the MD's & CEO's rooms are adjacent & 15 m wide and are equal in length and connected with other rooms only from longer side & floored with wood flooring. HR & Admin room is 12 m long and 13 m in width and both share a common wall with Manager's room which is floored with wood flooring. There is a conference hall of 30 m by 12 m connected to every room. Pantry room & server room are of same size. All walls are 3 m in height. Cost of marble is Rs. 100 per sq.m. while wood flooring is Rs. 120 per sq.m. painting work is done at the rate of Rs. 20 per sq.m.

43. What is the total cost of wooden flooring incurred in the renovation?

- (a) Rs. 90000 (b) Rs. 96960 (c) Rs. 95000 (d) Rs. 97000 (e) Rs. 97548

44. What is the percentage of area of office covered with marble?

- (a) 40% (b) 44.5% (c) 46.5% (d) 49.5% (e) None of these

45. Cost of painting of conference hall's walls is what percent less than cost of painting of MD's, CEO's & Manager's room together?

- (a) 54.54% (b) 53.5% (c) 55.5% (d) 56% (e) 53%

46. If the conference hall is to be painted with another quality of paint costing Rs.30 per sq.m. What will be the total cost of painting the entire area?

- (a) Rs. 20280 (b) Rs. 22420 (c) Rs. 25460 (d) Rs. 28480 (e) Rs. 29280

47. What is the ratio of area of pantry room to HR room?

- (a) 6 : 13 (b) 5 : 13 (c) 10 : 13 (d) 1 : 2 (e) 5 : 6

Directions (48 - 50): Study the following information carefully and answer the given questions. Given information are related and in sequence?

- I. Bag X: There are total 30 red and green balls. Probability of choosing a red and a green ball out of total is $\frac{40}{87}$. Number of Red balls in the bag is (A).
- II. (B) number of green balls are taken and after painting it red, placed back in to the bag X.
- III. Probability of choosing two green balls from the bag X is $\frac{7}{29}$.
- IV. Bag Y: All balls from bag X are taken and placed into bag Y. If (C) number of green balls are withdrawn from the bag and (C-5) number of red balls are added to the bag, then the probability of choosing two red balls from the bag is $\frac{2}{5}$.

48. Find the value of A?

- (a) 10 (b) 15 (c) 12 (d) 18 (e) 20

49. Find the probability of choosing (B-3) green balls from bag X (Consider the initial number of red and green balls in the bag)?
 (a) $\frac{35}{87}$ (b) $\frac{12}{29}$ (c) $\frac{40}{87}$ (d) $\frac{38}{87}$ (e) $\frac{34}{87}$
50. Find value of C?
 (a) 5 (b) 6 (c) 4 (d) 7 (e) 3

Directions (51-54): Study the passage given below and answer the following questions.

A tank whose length, breadth and height is 'a' unit, 'b' unit and 50 unit respectively is open from the top. Cost of painting the outer (ignore thickness of tank) side of the tank at Rs.2 per sq. unit is Rs.22640.

Three pipes – A, B & C are attached to this tank. Pipe – A & B supply water at the rate of 600 lit/min and 300 lit/min respectively. Pipe – A, B & C together can fill this tank in _____ minutes. Pipe – C alone can fill the tank in 7 hours. Water supplied by pipe – C alone in a minute is less than that of by pipe A alone & pipe – B alone. (1 cu. unit = 1 lit.) Each pipe consume 1 unit of electricity in a minute and cost of each unit is Rs.5.

51. If cost of electricity is Rs.1400 when only pipe - B & C together filled the tank, then find total water supplied by pipe – C in the tank.
 (a) 24000 liters (b) 30000 liters (c) 18000 liters
 (d) Cannot be determined (e) None of the above.
52. If length of tank is 70 unit, then find capacity of the tank.
 (a) 46000 liters (b) 60000 liters (c) 63000 liters (d) 42000 liters (e) None of the above.
53. If only A & C together can fill the tank in 60 minutes, then find time taken by A, B & C together to fill the tank.
 (a) 60 minutes (b) 48 minutes (c) 54 minutes (d) 36 minutes (e) 42 minutes
54. Find the approximate cost of electricity, if tank is filled by pipe – A, B & C together and efficiency of pipe – C is 200 lit/min.
 (a) Rs.1643 (b) Rs.1912 (c) Rs.659 (d) Rs.1432 (e) Rs.1145

Direction (55-58): Read the data carefully and answer the questions.

A man and his wife alone can do a task in (D) days and (T) days respectively. With the help of their son, they together complete the task in 12 days. They all together got 3000 \$ as wages for completing that task and then each of them went to buy some shoes and saved rest of the amount. Son likes sneakers shoes, father likes formal shoes and mother likes sport shoes. Total number of sneakers, sport shoes & formal shoes in the shop is 16, (Y) & (X) respectively. If shopkeeper picked up a shoe for showing them, then probability of it being either formal shoes or sport shoes is $\frac{5}{19}$ or $\frac{6}{19}$ and in the shop there are only three type of shoes. Cost price of a sneaker is (P) \$, shopkeeper marked it 40% above the cost price and in place of two successive discounts of 20% and 10%, he allowed only one discount of 20% on it due to this his profit increased by 8.4 \$ on selling a sneaker shoe and in this way saving of son (U) was reduced to 48 \$ on purchasing of 3 pairs of sneaker shoes. Cost price of a formal shoe is (E) % less than that of a sneaker, while selling price of a formal shoe is 15 \$ less than cost price of a sneaker shoe and man save 900 \$ after purchasing (N) formal shoes. Profit of shopkeeper on selling a formal shoe is $33\frac{1}{3}$ % less than the profit on a sneaker shoe and total profit earned by shopkeeper on selling all sneaker shoes is 140% more than profit earned by shopkeeper on selling formal shoe to man. If his wife did not purchase any shoe and man and his wife invested their respective saving in a hen farming business for (A) months and (B) months respectively and got profit in the ratio of 15: 16. Time taken by his wife alone to do that work is twice of (B) days.

55. A person finds that his only son's age after 'X' years will be 37.5% of his age at that time. From which of the following given sentences we can find the difference between age of person and his wife 5 years?
 I. Son is 2(Y-2) years younger than that of his mother.
 II. Ratio of present age of father to that of his son is 6:1.
 III. Ratio of present age of son to present age of his mother is 1:5.
 (a) Any two of the given statements (b) Either (I) or (II) & (III) (c) Only (I)
 (d) None of the these (e) Only (III)

- 56.** Distance covered by boat in downstream is P km which is 25km more than the distance covered by boat in upstream. Check which of the following given statements will help in determining speed of boat in still water which is equal to N.
- Ratio of time taken by the boat in downstream to that of in upstream is 9:10.
 - Ratio of speed of boat in upstream to that of in still water is 4:7 and boat takes 4 hours more to cover above mentioned upstream distance in upstream than to cover above downstream distance.
- (a) None of the above (b) Only (I) (c) Only (II)
(d) Either (I) or (II) (e) All of the above
- 57.** Chiru can do a work in less than 25 days while Binny and Deep together can do that work in more than Z days. Binny and Chiru together can do that work in $16\frac{2}{3}$ days. Find which of the following variables' value can replace Z so that number of days taken by Deep alone is not less than $33\frac{1}{3}$ days.
- I.T II.D III. B IV.E V.X
(a) Only (II) and (IV) (b) Only (I), (III) and (IV)
(c) Only (II), (III) and (V) (d) Only (I), (II) and (IV) (e) All of the above
- 58.** Ayush went to a stationary shop and purchased some pens and some copies and total amount paid by him is Rs 360 and price of each pen is Rs 30 which is (T-5) % less than price of a copy. Check which of the following statements helps in determining the total number of copies and pens bought by him is equal to N.
- Number of copies bought is 2 more than the number of pens.
 - If he had bought as many copies as he bought originally the pens and vice-versa then he would have saved an amount equal to half the price of a pen or of a copy.
- (a) From (I) only (b) Either (I) or (II) (c) None of the above (d) All of the above (e) From (II) only

Directions (59-61): Read the given information carefully and answer the following questions.

Given paragraph shows number of cycles and bikes manufactured by 'Hero' and 'Honda'. (Note: All cycles and bikes manufactured on a certain day may be either sold or not)

Hero:

Cost incurred on manufacturing a cycle was Rs. 1800. Revenue generated on selling each cycle at Rs. 2400 was Rs. 1,80,000. Profit made on selling some cycles was Rs. 18,000.

Ratio of cost incurred on manufacturing a bike to that on a cycle is 110:9. Profit on selling 60% of the total bikes manufactured was Rs. 2,40,000 and thereby making a profit of $22\frac{8}{11}\%$.

Honda:

Number of cycles manufactured by Hero is 25% more than that of manufactured by Honda. Profits earned on selling all cycles manufactured is 180%. Profit earned on selling all 64 bikes manufactured at the rate of Rs. 45,000 per bike was Rs. 4,80,000. Profit earned on selling all cycles manufactured is 22.5% of the profit earned on selling all manufactured bikes.

Note:

I. Revenue = Selling price of a cycle/bike \times number of cycles/bikes sold

II. Profit = Revenue – Cost incurred to produce all the cycles/bikes

III. Profit % = $\frac{\text{profit}}{\text{total cost incurred}} \times 100$

- 59.** Had the cost incurred on manufacturing a cycle by Hero been 25% lesser than the original and had it been able to sell 60 cycles and 60 bikes that day, then what would have been the total profit or loss earned by Hero on selling both the cycles and bikes?
- (a) Rs 1,09,500 (b) Rs 1,07,500 (c) Rs 1,17,500 (d) Rs 1,15,750 (e) Rs 1,21,500
- 60.** Quantity I: Difference between the cost incurred by Hero and Honda in manufacturing a bike?
Quantity II: Sum of profits earned by selling a bike for both Hero and Honda together?
- (a) Quantity I > Quantity II (b) Quantity I < Quantity II
(c) Quantity I \geq Quantity II (d) Quantity I \leq Quantity II
(e) Quantity I = Quantity II or no relation
- 61.** Find the difference between total cost incurred by Hero in manufacturing all bikes and cycles together and the total cost incurred by Honda in manufacturing all cycles and bikes together?
- (a) Rs 5,34,500 (b) Rs 5,32,000 (c) Rs 5,36,000 (d) Rs 5,38,000 (e) Rs 5,39,000

Direction (62-65): Paragraph given below shows initial investment of four person (Veer, Anurag, Dharmendra and Deepak), and additional investment at the end of first quarter, second quarter and after third quarter. Read the data carefully and answer the question.

Anurag invested 50% more than Veer and Dharmendra invest 25% more than Veer, while investment of Deepak is 50% more than Anurag. At the end of first quarter Veer invest additional 75% of his initial investment and ratio of additional investment of Veer, Anurag, Dharmendra and Deepak is 3 : 4 : 3: 6 respectively. Additional investment of Dharmendra at the end of first quarter is 1.5 times of his additional investment at the end of second quarter, while additional investment of Deepak at the end of second quarter is 50% more than additional investment of Dharmendra at the end of second quarter. Additional investment of Veer and Deepak at the end of second quarter is 1.5 times and 0.75 times of additional investment of Anurag at the end of second quarter respectively. Sum of additional investment of all four at the end of third quarter is 1.8 lakhs and additional investment of Anurag at the end of third quarter is 60% of additional investment of Veer at the end of third quarter. Additional investment of Dharmendra and Deepak at the end of third quarter is $33\frac{1}{3}\%$ & 100% more than that of Anurag respectively. Additional investment of Deepak at the end of second quarter is 50% of his additional investment at the end of third quarter.

62. Find the ratio of profit share of Veer, Anurag and Deepak at the end of one year respectively.

- (a) 42 : 47 : 63 (b) 42 : 43 : 65 (c) 42 : 47 : 67 (d) 42 : 47 : 66 (e) None of these

63. Veer, Deepak & Ayush starts a business and Ayush invested Rs. 5x initially. After six months Ayush invested additional Rs. 20000 and profit share of Ayush after one year is Rs. 28000 out of total profit of Rs. 136000, then find the investment of Ayush for second half (Refer above data for investment of Veer and Deepak)?

- (a) 80000 Rs. (b) 84000 Rs. (c) 72000 Rs. (d) 96000 Rs. (e) 78000 Rs.

64. At the end of year, profit of Dharmendra is approximately what percent more or less than the profit of Veer?

- (a) 12% (b) 10% (c) 15% (d) 8% (e) 17%

65. If at the end of fourth quarter additional investment by all four persons is Rs. 10000 more than their respective initial investment and at the end of fifth quarter total profit is Rs. 234400, then find difference between profit share of Veer and Deepak?

- (a) 24000 Rs. (b) 30000 Rs. (c) 28000 Rs. (d) 20000 Rs. (e) 14000 Rs.

Direction (66-70): A, B and C are three persons who each invested some amount in three different schemes (X, Y and Z). Data tells about amount invested and time of investment by them. Study the data carefully & answer the following questions.

Amount invested by A in scheme 'X' is 50% of amount invested by C in the same scheme. B invested Rs 40,000 in scheme 'X' and time for which he invested in scheme 'X' is five months more than time for which A invested in the same scheme. Ratio of amount invested by A and C in Scheme 'Z' is same as ratio of amount invested by A and C in scheme 'X'. B invested 10,000 less in scheme 'Z' than that of amount invested by C in scheme 'Z'.

Time of investment of B and C is same in scheme 'Y'. Amount invested by B in scheme 'Y' is 4% less than amount invested by A in scheme 'Y'. C invested Rs 50000 more than B in scheme 'Y'. A invested 40% less in scheme 'X' than that of amount invested by him in scheme 'Y'. Ratio of amount invested by C in scheme 'X' to scheme 'Y' is 15 : 22.

Out of total profit earned from scheme 'Y', C got 50%. Ratio of profit share of A and B is 3 : 4 in scheme 'Z', while time of investment of A and B in scheme 'Z' is 4 : 3. C invested for ten months in scheme 'Z'.

A got 25% of total profit both in scheme 'Z' as well as in scheme 'X'. Time of investment of A in scheme 'X' is two months less than that of in scheme 'Z'. A invested for sixteen months in scheme 'Y'

66. B and C both invested same amount they invested in scheme 'Y' in two different schemes i.e, P_1 and P_2 respectively. P_1 and P_2 offers 20% p.a at C.I and 25% p.a at S.I respectively. Find the difference between interest earned by both after two years?

- (a) Rs. 28,800 (b) Rs. 28,900 (c) Rs. 28,000 (d) Rs. 28,100 (e) Rs. 28,600

67. If C earned Rs. 14,490 profits from scheme 'Z' and ratio between profit earned by C from scheme Z and X is 9 : 4, then find total profit earned by A from scheme 'X' and 'Z' together?

- (a) Rs. 15674 (b) Rs. 13294 (c) Rs. 14324 (d) Rs. 14966 (e) Rs. 15022

68. If scheme 'Y' offers S.I. at the rate of 15% p.a, then find interest earned by A?
 (a) Rs 13250 (b) Rs 14500 (c) Rs 14000 (d) Rs 12500 (e) Rs 13750
69. Amount invested by C in scheme 'Z' is what percent more than amount invested by A in scheme 'X'?
 (a) 140% (b) 100% (c) 144% (d) 50% (e) 20%
70. If B doubles his investment in scheme 'X', then find what percent of decrement is seen in C profit percentage?
 (a) 20% (b) 40% (c) $28\frac{4}{7}\%$ (d) $42\frac{6}{7}\%$ (e) $57\frac{1}{7}\%$

Direction (71-73): Study the following information given below and answer the following questions.

Mr Kunal Dwivedi wants to buy a motorbike which is priced at Rs 45,500. The bike is also available at Rs 25,000 down payment and monthly installment of Rs 1000 per month for 2 years or Rs 18,000 down payment and monthly installment of Rs 1000 per month for 3 years. Mr Kunal has with him only Rs 12,000. He wants to borrow the balance money for the down payment from a private lender whose terms are:

If Rs 6,000 is borrowed for 12 months, the rate of interest is 20 per cent. The interest will be calculated on the whole amount for the whole year, even though the repayment has to be done in 12 equal monthly installments starting from the first month itself. Thus he will have to repay an amount of Rs 600 per month for 12 months to repay Rs 6000 (Principal) + Rs 1200 (Interest @ 20 per cent). If Rs 10,000 upwards is borrowed for one year, the rate of interest is 30 per cent and is calculated in exactly the same manner as above.

71. If Mr. Kunal is ready to pay either of the down payments then which of the installments schemes is the better option of the two ? (Assume that Mr Kunal will pay the installments out of his own earnings and he keeps his savings with himself and earns no interest on the same.) Also assume for the down payment, he saves the balance before purchase.
 (a) Rs 1000 for 2 years (b) Rs 1000 for 3 years
 (c) Either of two (d) Data inadequate (e) none of these
72. What is the approximate percentage difference in the total amount paid to the bike dealer, between the two installment schemes (with respect to the total payment of the scheme with Rs 25,000 down payment?) (Assume that Mr Kunal will pay the installments out of his own earnings and he keeps his savings with himself and earns no interest on the same) Also assume for the down payment, he saves the balance before purchase.
 (a) 10.2% (b) 13.5% (c) 11.4% (d) 14.3% (e) none of these
73. If kunal can spare only a total of Rs 2000 to be paid to the bike dealer and the money lender from his monthly earnings starting from the first month onwards which scheme should he choose (time taken to pay to the lender is equal to the time to pay all installments)?
 (a) Rs 1000 per month for 2 years (b) Rs 1000 per month for 3 years (c) Either of two
 (d) Data inadequate (e) none of these

Directions (74-78): Ramesh has (P) acres of lands, (Q) horses and (R) cars that he wants to divide among four sons i.e. A, B, C and D. The cost of each horse and each car was Rs. (X) and Rs (Y) respectively while the cost of an acre of land was Rs. (Z).

All the property was shared among the four persons in such a way that A and C got together the same wealth as B and D got together. A got $\frac{1}{3}$ rd of the horses and 20% of the cars while B received 50% of the cars which is equal to the 50% of his total wealth. The no. of horses that A and C got together was 50% more than that of B and D together. C and D got 8 and 7 horses respectively and A and C got equal no. of cars and D got 20 cars less than that of B. D got twice the land than that of C but 20% less than that of B.

Total cost of land of B and D together is Rs 80,000 more than cost of land of A. Wealth of B is Rs 20,000 more than that of A.

74. What is the difference between the wealth of A and wealth of D?
 (a) Rs 1,20,000 (b) Rs 1,00,000 (c) Rs 1,40,000 (d) Rs 1,60,000 (e) none of these
75. If B wanted to exchange all his cars with the horses, then who can exchange his/her horses in terms of wealth?
 (a) A (b) C (c) D (d) can't be determined (e) none of these

76. The wealth of D is what percent less than that of B?
 (a) 42% (b) 45% (c) 35% (d) 48% (e) none of these
77. What is the number of cars for C?
 (a) 8 (b) 10 (c) 5 (d) 12 (e) none of these
78. Find ratio of X to Y?
 (a) 5: 2 (b) 15: 7 (c) 5: 3 (d) 8: 5 (e) none of these

Directions (79-83): Neeraj have some toys which are in the form of different structures. These are cylindrical, conical, spherical. Other than solid conical structure, all two are of both types i.e., hollow as well as solid.

- Volume of a conical toy is three times of the volume of a solid cylindrical toy while radius of a solid spherical toy is half than that the radius of a conical toy. Outer radius of hollow cylindrical toys is same as radius of solid spherical toy while average of outer radius and inner radius of hollow cylindrical toys is equal to radius of solid cylindrical toy. Height of cylindrical, conical and hollow cylindrical toys is same i.e, 14cm
- Number of solid spherical toys is 20% of total number of toys Neeraj have. Number of hollow spherical toys is 150% more than number of conical toys. Ratio between number of solid cylindrical toys to number of conical toys is 3 : 2. Total number of hollow cylindrical toys is 40% of total number of toys Neeraj have and also '20' more than the total number of solid spherical toys Neeraj have.
- Volume of a hollow spherical toy is $33,957 \text{ cm}^3$ whose inner radius is half of its outer radius. Volume of a hollow spherical toy is 5.25 time of volume of conical toy.

79. Find the total space taken by all solid spherical toys? (in cm^3)
 (a) 97020 (b) 48510 (c) 72765 (d) 14553 (e) 24255
80. Find the number of conical toys Neeraj have?
 (a) 40 (b) 20 (c) 15 (d) 12 (e) 8
81. Find the curved surface area of one hollow cylindrical toy? (in cm^2)
 (a) 616 (b) 1232 (c) 924 (d) 462 (e) 1386
82. Find the ratio between outer radius of hollow spherical toy to radius of solid cylindrical toy?
 (a) 4 : 1 (b) 3 : 2 (c) 3 : 1 (d) 4 : 3 (e) 2 : 1
83. Volume of one hollow cylindrical toy is how much more than volume of one cylindrical toy?(in cm^3)
 (a) 4312 (b) 3234 (c) 2696 (d) 2156 (e) 1078

Practice MCQs for Mains_(Solutions)

Sol (1 - 3):



Where, L m is length of bridge

Case (I) when dog is running towards train

Let speed of dog be x m/s

Time taken by train to reach 50m far from A = time taken by dog to get off the bridge (towards train)

$$\frac{2L-50}{20} = \frac{\left(\frac{L}{2}-20\right)}{x} \dots\dots\dots(i)$$

Case (II) when dog start running away from train

Time taken by train to reach 12.5 m far from B = time taken by dog to reach 12.5 m from B

$$\frac{3L-12.5}{20} = \frac{\left(\frac{L}{2}+7.5\right)}{x} \dots\dots\dots(ii)$$

From (i) & (ii)

$$\frac{2L-50}{\frac{L}{2}-20} = \frac{3L-12.5}{\frac{L}{2}+7.5}$$

On solving, L = 100m

Using (i), x = 4 m/s

- (c):** Now, a cow is standing 'd' m far from A on track
 Speed of cow = x = 4 m/s
 Time taken by train to reach A = time taken by cow to get off bridge (towards train)
 $\frac{2L}{20} = \frac{d}{x}$
 On solving, d = 40 m
 Cow is standing 40 m away from point A on track.
- (a):** AB = 100 m
- (c):** Let length of tunnel be 'l' meters
 So, $108 \times \frac{5}{18} = \frac{3 \times (160 + l)}{40}$
 $1200 = 480 + 3l$
 $3l = 720$
 $l = 240$ meters

Sol (4 – 8):

Let one woman, one man and one children can complete w, m and c units of work in one day

From question

$$xw \times 2y = 1.5mx \times y = 2xc \times 3y$$

$$2w = 1.5m = 6c$$

So, or

$$2w = 1.5m = 6c = k$$

So,

$$w : m : c = 3 : 4 : 1$$

$$\text{Total work} = \frac{45}{2} \times 8(1w + 1m + 1c)$$

$$= \frac{45}{2} \times 8 \times 8$$

$$= 1440 \text{ units}$$

According to question

$$9m \times (y + 20) = 1440$$

$$9 \times 4 (y + 20) = 1440$$

$$y = 20$$

$$\text{So, } x \times w \times 2y = 1440$$

$$x \times 3 \times 2 \times 20 = 1440$$

$$x = 12$$

4. (c): $y = 20$

5. (e): work completed by 36 women in 4 days

$$= 36 \times 3 \times 4$$

$$= 432 \text{ units}$$

After 4 days

$$\text{Remaining unit} = 1008$$

Now in one day units completed by 6 women and 8 men = $32 + 18 = 50$ units

$$\text{Required time} = \left(\frac{1008}{50} + 4\right) \text{ days}$$

$$= 24\frac{4}{25} \text{ days}$$

6. (a): Value of $x = 12$

7. (e): Required percentage = $\frac{1}{8} \times 100 = 12.5\%$

8. (e): Total work completed = $6 \times 3 \times 14 + 6 \times 4 \times 10$

$$= 252 + 240$$

$$= 492 \text{ units}$$

$$\text{Remaining work} = 1440 \text{ units} - 492 \text{ units}$$

$$= 948 \text{ units}$$

$$\text{Required time} = \frac{948}{6} \text{ days} \Rightarrow 158 \text{ days}$$

Sol (9-13):

Ratio of profit share

Arun	Veer
60000×15	90000×8
5	4

Let the profit share of Arun & Veer be Rs. 5x & Rs. 4x respectively.

$$\text{ATQ, } x = 10000$$

$$\text{Profit share of Arun} = \text{Rs. } 50,000$$

$$\text{Profit share of Veer} = \text{Rs. } 40,000$$

Amount received by Arun at the end of 1.5 years at 20% p.a

$$\text{CI} = \text{Rs. } 66,000$$

Amount received by Veer at the end of 2 years at 15% p.a

$$\text{SI} = \text{Rs. } 52,000$$

$$\text{Cost price of bike} = \text{Rs. } 66,000$$

$$\text{Selling price of bike} = \text{Rs. } 66,000 \times 0.95 = \text{Rs. } 62,700$$

$$\text{Cost price of laptop } L_1 = \text{Rs. } 26,000$$

$$\text{Cost price of laptop } L_2 = \text{Rs. } 26,000$$

$$\text{Selling price of laptop } L_1 = \text{Rs. } 28,600$$

$$\text{Selling price of laptop } L_2 = \text{Rs. } 29,900$$

9. (b): Profit earned by Veer on selling both laptops = $(28600 + 29900 - 52000) = \text{Rs. } 6500$

$$\text{Required interest received} = \frac{6500 \times 4 \times 10}{100} = \text{Rs. } 2600$$

10. (a): Price of a bike after two years.

$$= 66000 \left(1 - \frac{15}{100}\right)^2 = \text{Rs. } 47,685$$

11. (d): Marked price of laptop $L_1 = 26000 \times 1.4 = \text{Rs. } 36,400$

$$\text{New selling price} = \text{Rs. } 28600 + \text{Rs. } 2600 = \text{Rs. } 31,200$$

$$\text{Then discount \%} = \frac{36400 - 31200}{36400} \times 100 = \frac{5200}{36400} \times 100 = 14\frac{2}{7}\%$$

12. (c): Total selling price of all the three items

$$= \text{Rs. } (62,700 + 28,600 + 29,900)$$

$$= \text{Rs. } 1,21,200$$

$$\text{Total cost price of all the items} = \text{Rs. } (66,000 + 52,000)$$

$$= \text{Rs. } 1,18,000$$

$$108\% \text{ of total CP} = \text{Rs. } 1,27,440$$

$$\text{Required difference} = \text{Rs. } 6240$$

13. (b): Current net profit on all the items together

$$= (62700 + 28600 + 29900) - (66000 + 52000) = \text{Rs. } 3200$$

Let the profit share of Arun and Veer be Rs. 5x & Rs. 4x respectively.

$$\text{ATQ, } x = 11000$$

$$\text{Profit share of Arun} = \text{Rs. } 55,000$$

$$\text{Profit share of Veer} = \text{Rs. } 44,000$$

$$\text{Amount received by Arun at the end of 1.5 yr} = \text{Rs. } 72,600.$$

$$\text{Selling price of bike} = \text{Rs. } 72,600 \times 0.95 = \text{Rs. } 68,970$$

$$\text{Amount received by Veer at the end of 2 years} = \text{Rs. } 57,200$$

$$\text{Cost price of laptop } L_1 = \text{Rs. } 28,600$$

$$\text{Selling price of laptop } L_1 = \text{Rs. } 31,460$$

$$\text{Cost price of laptop } L_2 = \text{Rs. } 28,600$$

$$\text{Selling price of laptop } L_2 = \text{Rs. } 32,890$$

$$\text{New net profit} = (68970 + 31460 + 32890) - (72600 + 57200) = \text{Rs. } 3520$$

$$\text{Required changes} = \text{Rs. } (3520 - 3200) = \text{Rs. } 320$$

Sol (14 - 18):

Let passengers traveling from Delhi to Lucknow on other days of week = x

So, passengers traveling from Delhi to Lucknow on Sunday = $\left(\frac{100+2R}{100}\right)x$

When number of passengers traveling from Delhi to Lucknow on Sunday decreased by 'R'%

$$= \left(\frac{100-R}{100}\right) \left(\frac{100+2R}{100}\right) \times x$$

$$\text{Given, } \left(\frac{100+2R}{100}\right)x - x = 960$$

$$x \left(\frac{100+2R}{100} - 1\right) = 960 \Rightarrow x \times \frac{2R}{100} = 960 \quad \dots(i)$$

And,

$$\left(\frac{100+2R}{100}\right)x - \left(\frac{100-R}{100}\right) \left(\frac{100+2R}{100}\right)x = 624$$

$$\left(\frac{100+2R}{100}\right)x \left[1 - \frac{(100-R)}{100}\right] = 624 \dots(ii)$$

Dividing (i) by (ii)

$$\frac{\frac{2R}{100}x}{x \frac{(100+2R)}{100} \times \frac{R}{100}} = \frac{960}{624}$$

$$\frac{200}{100+2R} = \frac{960}{624}$$

$$R = 15\%$$

Total passenger traveling from Delhi to Lucknow on other days of week = $\left(\frac{100+2 \times 15}{100}\right)x - x = 960$

$$1.3x - x = 960$$

$$x = 3200$$

Total passenger traveling from Delhi to Lucknow on Sunday = $3200 \times \left(\frac{100+2 \times 15}{100}\right) = 4160$

Let number of passengers like only coffee = a

And, number of passengers like both coffee and tea = y

And, number of passengers like only tea = z

Given, $(a + y + z) = 3200$ ----- (i)

$$(a + y) = \frac{55}{100} \times 3200$$

$$(a + y) = 1760 \quad \dots(ii)$$

From equation (i) & (ii):

$$1760 + z = 3200$$

$$z = 1440$$

Also,

$$(y + z) = 70 \times \frac{3200}{100}$$

$$(y + z) = 2240 \quad \dots(iii)$$

From equation (i) & (iii):

$$a + 2240 = 3200$$

$$a = 960$$

$$\text{And, } y = 3200 - (1440 + 960) = 800$$

$$14. (d): 6R\% = 15 \times 6 = 90\%$$

$$15. (b): \text{Required number of passengers} = 960 + 1440 = 2400$$

$$16. (a): \text{Equivalent CI for two years at the rate of } 15\% \text{ p.a.} \\ = 15 + 15 + \frac{15 \times 15}{100} = 32.25\% \\ \text{Required amount} = 3600 + 3600 \times \frac{32.25}{100} \\ = 4761 \text{ Rs.}$$

$$17. (b): \text{Number of passengers traveling from Delhi to Lucknow on Sunday belongs to urban area} \\ = 4160 \times \frac{5}{8} = 2600$$

$$18. (e): \text{Required difference} = 1440 - 960 = 480$$

Sol (19 -23):

ATQ -

$$P + P \times \frac{R \times 4}{100} = (P + 600)$$

$$100P + 4PR = 100P + 60000$$

$$4PR = 60000$$

$$PR = 15000 \text{ ----- (i)}$$

$$\text{Or } R = \frac{15000}{P}$$

Investment of Anurag = $(P + 600)$ Rs.

Investment of Ayush = $64R$ Rs.

Let time for Anurag and Ayush invested be $3t$ & $4t$ respectively

$$\frac{64R \times 4t}{(P+600) \times 3t} = \frac{3200}{(8600-3200)}$$

From (i) putting value of R

$$144R = \frac{15000}{R} + 600$$

$$R = 12.5\%$$

$$\text{So, } P = \frac{15000}{12.5} = 1200 \text{ Rs.}$$

Selling price of article = $72 \times 12.5 = 900$ Rs.

$$M \times \frac{(100-d)}{100} = 900$$

$$100M - Md = 90000 \text{ ----- (ii)}$$

$$\text{Also, } 1200 \times \frac{(100-d)}{100} = 80 \times 12.5 = 1000$$

$$1200 - 12d = 1000$$

$$d = 16\frac{2}{3}\%$$

$$\text{So, Cost price of article} = 1000 \times \frac{3}{4} = 750 \text{ Rs.}$$

Putting value of 'd' in (ii)

$$100M - M \times \frac{50}{3} = 90000$$

$$\frac{250M}{3} = 90000$$

$$M = 1080 \text{ Rs.}$$

$$19. (e): \text{Value of } (12R + 3P) = (12 \times 12.5 + 3 \times 1200) \\ = (150 + 3600) \\ = 3750$$

$$20. (a): \text{Required value} = \frac{50}{3} \times \frac{1}{100} \times (566 + 1234) \\ = \frac{1}{6} \times 1800 = 300$$

$$21. (b): \text{Quantity I} - \frac{300}{100} \times 1080 = 3240 \\ \text{Quantity II} - \frac{270}{100} \times 1200 = 3240 \\ \text{So, Quantity I} = \text{Quantity II}$$

22. (c): Value of $\frac{M}{R} = \frac{1080}{12.5} = 86.4$

23. (b): Selling price of article = $(1080 + 1200) = 2280$ Rs.
ATQ -

$$3800 \times \frac{(100-X)}{100} \times \frac{100-(X-5)}{100} = 2280$$

$$X = 25, 180$$

But some profit is earned so 180% can never be discount

$$\text{So, } 2X = 50$$

24. (b): $X = 10; Y = 50; Z = 18$

Clearly, $X < Y > Z$

25. (d): amount distributed by Ayush = Rs 1540

Amount received by Amit now

$$= \frac{1540}{11} \times 4 = \text{Rs } 560$$

Actual amount received by Amit = Rs 110

Required difference = Rs 450

26. (a): since ratio of milk to water in actual mixture is $Y : 40 = 5 : 4$

This ratio remains same unless further quantity is added

$$\text{Required difference} = \frac{5-4}{5+4} \times 18 = 2 \text{ lit}$$

27. (e): quantity of milk left with Amit = $\frac{5}{9} \times (90 - 18) = 40$ lit

Quantity of water left = 32 lit

Milk added = 18 lit

$$\text{Required ratio} = (40 + 18) : 32 = 29 : 16$$

28. (c): Quantity I: required ways = $10C_3 = 120$ ways

$$\text{Quantity II: required value} = \frac{10 \times 50 \times 18}{10 + 50 + 18} = \frac{1500}{13} \approx 115.38$$

Clearly, Quantity I > Quantity II

Sol (29-32):

Shop P (gel pen) -

$$\text{Number of units sold} = \frac{3600}{48} = 75$$

Let the number of units produced that remains unsold be 'x'

ATQ -

$$360 = 3600 - (75 + x) \times 36$$

$$x = 15$$

Total number of units produced = 90

Cost incurred in producing all units = $36 \times 90 = 3240$ Rs.

$$\text{Profit} = \frac{360}{3240} \times 100 = 11 \frac{1}{9} \%$$

(Dot pen)

$$\text{Per unit cost price of dot pen} = 36 \times \frac{11}{9} = 44 \text{ Rs.}$$

Let total number of units produced be 'y'

ATQ -

$$\frac{250}{11} = \frac{480}{\frac{3}{5}y \times 44} \times 100$$

$$y = 80$$

$$\text{Number of units sold} = 80 \times \frac{3}{5} = 48$$

$$\text{Cost incurred in produced all units} = 44 \times 80 = 3520 \text{ Rs.}$$

$$\text{Profit per units} = \frac{480}{48} = 10 \text{ Rs.}$$

Per units selling price of units = 54 Rs.

Revenue on selling all producing units

$$= 80 \times 54 = 4320 \text{ Rs.}$$

$$\text{Total profit on selling all units} = 80 \times 10 = 800 \text{ Rs.}$$

Shop Q (Gel pens) -

$$\text{Number of gel pen produced by Q} = 90 \times \frac{4}{5} = 72$$

Given, profit on dot pen = 960 Rs.

$$\text{So, profit on gel pen} = 960 \times \frac{225}{100} = 2160 \text{ Rs.}$$

Cost incurred in produced all units

$$= 2160 \times \frac{100}{180} = 1200 \text{ Rs.}$$

$$\text{Selling price per unit} = \frac{1200 + 2160}{72} = 46 \frac{2}{3} \text{ Rs.}$$

(Dot pen) -

$$\text{Total revenue} = 64 \times 90 = 5760 \text{ Rs.}$$

$$\text{Total cost incurred in produced all units} = 5760 - 960 = 4800 \text{ Rs.}$$

$$\text{Profit} = \frac{960}{4800} \times 100 = 20\%$$

$$\text{Cost price per units} = \frac{4800}{64} = 75 \text{ Rs.}$$

29. (d): Required percentage = $\frac{15}{32} \times 100 = 46 \frac{7}{8} \%$

30. (a): Required ratio = $\frac{54 \times 3}{140} = 81 : 70$

31. (e): Required profit = $64 \times 75 \times \frac{3}{5} = 2880 \text{ Rs.}$

32. (b): Required percentage = $\frac{32-15}{32} \times 100 = 53.125\%$

Sol (33-37):

Let length of each hall & each pantry be 22l & 7l respectively

ATQ -

$$2(22l + 33) - 2(7l + 15) = 126$$

$$44l + 66 - 14l - 30 = 126$$

$$30l = 90$$

$$l = 3 \text{ m}$$

$$\text{Length of hall} = 22 \times 3 = 66 \text{ m}$$

$$\text{Length of pantry} = 7 \times 3 = 21 \text{ m}$$

$$\text{Area of pantry room} = 21 \times 15 = 315 \text{ m}^2$$

Let length of meeting room = a m

$$315 - 14 \times a = 77$$

$$14a = 238$$

$$a = 17 \text{ m}$$

Let length of HR room be x m

$$\frac{2(x+16)}{16 \times x} = \frac{19}{88}$$

$$176x + 2816 = 304x$$

$$128x = 2816$$

$$x = 22 \text{ m}$$

Length of CEO room = $22 + 4 = 26$ m

Breadth of CEO room = $16 + 2 = 18$ m

	Length (m)	Breadth (m)
Hall	66	33
Pantry	21	15
Meeting room	17	14
HR room	22	16
CEO room	26	18

33. (b): Let height of cylinder is 'h' m

Given,

$$\pi r^2 h = 4158$$

$$\frac{22}{7} \times \frac{21}{2} \times \frac{21}{2} \times h = 4158$$

$$346.5 h = 4158$$

$$h = \frac{4158}{346.5}$$

$$h = 12 \text{ m}$$

$$\text{Cost of polishing the vessel} = 5(2\pi rh + 2\pi r^2)$$

$$= 5 \times 2 \times \frac{22}{7} (10.5 \times 12 + 10.5 \times 10.5)$$

$$= 33.75 \times 44 \times 5 = 7425 \text{ Rs.}$$

34. (e): Let radius of larger & smaller circular park be $6x$ & $5x$ respectively

ATQ –

$$2 \times \frac{22}{7} (5x + 6x) - 2(26 + 18) = 154$$

$$\frac{484x}{7} = 154 + 88$$

$$484x = 1694$$

$$x = 3.5 \text{ m}$$

$$\text{Total cost of fencing the smaller circular park} = 25$$

$$\times (2 \times \frac{22}{7} \times 5 \times 3.5)$$

$$= 25 \times 110 = 2750 \text{ Rs.}$$

35. (d): Total perimeter of a meeting room and a hall =
 $2 \times (17 + 14) + 2 \times (66 + 33) \text{ m}$
 $= 260 \text{ m}$

$$\text{Area of a CEO room} = 26 \times 18 = 468 \text{ m}^2$$

$$\text{Required \%} = \frac{260}{468} \times 100 = \frac{500}{9} = 55\frac{5}{9} \%$$

36. (d): New breadth of meeting room = $2 \times 14 = 28$ m

$$\text{New length of meeting room} = 17 - 10 = 7 \text{ m}$$

$$\text{Area of each meeting room} = 28 \times 7 = 196 \text{ m}^2$$

$$\text{Area of each square cabin} = \frac{196}{4} = 49 \text{ m}^2$$

Four cabins in one meeting room

$$\text{So, total cabins in all the three meeting rooms} = 3 \times 4 = 12$$

$$\text{Total cost of all square cabins built in the three meeting rooms}$$

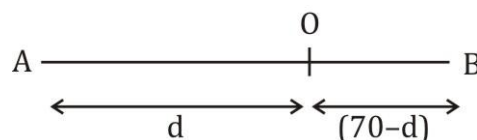
$$= 12 \times 49 \times 12.5 = 7350 \text{ Rs.}$$

37. (a): Perimeter of a HR room = $2(22 + 16) = 76$ m

$$\text{Perimeter of a pantry} = 2(21 + 15) = 72 \text{ m}$$

$$\text{Required difference} = 76 - 72 = 4 \text{ m}$$

Sol (38-42):



Let X drops Y at a distance of d km from point A.

$$\text{Time taken by X to cover a distance of } d \text{ km} = \frac{d}{20} \text{ hr.}$$

$$\text{Distance Covered by Z in } \frac{d}{20} \text{ hr.} = \frac{d}{20} \times 5 = \frac{d}{4} \text{ km.}$$

Distance From A where X meets Z

$$= \frac{d}{4} + \frac{(d - \frac{d}{4})}{25} \times 5 = \frac{8d}{20} = \frac{2d}{5} \text{ km}$$

Remaing distance that X has to cover

$$= (70 - \frac{2d}{5}) \text{ km.}$$

Distance covered by Y in the time when X meets Z

$$= 5 \times \frac{(d - \frac{d}{4})}{25} = \frac{3d}{20} \text{ km.}$$

ATQ,

$$\frac{70 - \frac{2d}{5}}{20} = \frac{70 - d - \frac{3d}{20}}{5}$$

$$\Rightarrow d = 50 \text{ km.}$$

38. (e): Required distance covered by Z on foot = 20 km

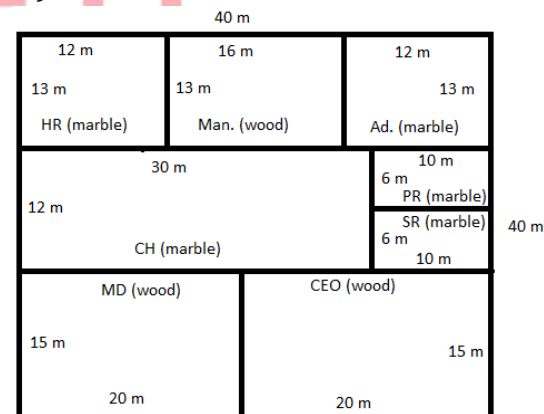
$$39. (b): \text{Required time} = \frac{d}{20} \text{ hr} = 2.5 \text{ hr}$$

$$40. (e): \text{Required distance} = 70 - \frac{2d}{5} = 50 \text{ km}$$

$$41. (d): \text{Required distance} = \frac{3d}{20} = 7.5 \text{ km}$$

$$42. (c): \text{Required time} = \frac{d}{20} + \frac{70 - d}{5} = 6.5 \text{ hr}$$

Sol (43-47):



$$43. (b): \text{Required cost} = (13 \times 16 + 2 \times 15 \times 20) \times 120 = 808 \times 120 = \text{Rs. } 96960$$

$$44. (d): \text{Area covered with marble} = 40 \times 40 - (13 \times 16 + 2 \times 15 \times 20) = 792 \text{ sq. m.}$$

$$\text{Required \%} = \frac{792}{1600} \times 100 = 49.5\%$$

45. (a): Cost of painting of conference hall = $2 \times (12 + 30) \times 3 \times 20 = \text{Rs. } 5040$
 Cost of painting MD's & CEO's room = $[2 \times 2 \times (15 + 20) \times 3 \times 20] = \text{Rs. } 8400$
 Cost of painting Manager's room = $[2 \times (13 + 16) \times 3 \times 20] = \text{Rs. } 3480$
 Required percent = $\frac{(8400+3480) - 5400}{(8400+3480)} \times 100 = 54.54\%$

46. (e): Cost of painting CH = $2 \times (12 + 30) \times 3 \times 30 = \text{Rs. } 7560$
 Cost of painting other than CH
 $= [2 \times 2(15 + 20) \times 3 + 2 \times 2(6 + 10) \times 3 + 2 \times 2(13 + 12) \times 3 + 2 \times (13 + 16) \times 3] \times 20 = \text{Rs. } 21720$
 Total cost of painting = $7560 + 21720 = \text{Rs. } 29280$

47. (b): Area of pantry room = $6 \times 10 = 60 \text{ sq. m.}$
 Area of HR room = $13 \times 12 = 156 \text{ sq. m.}$
 Required ratio = $\frac{60}{156} = 5 : 13$

Sol (48-50):

Let the number of green balls in bag X be 'a'
 Then number of red balls in the bag = $(30 - a)$

ATQ

$$aC_1 \times (30 - a)C_2 = \frac{40}{87}$$

$$a \times (30 - a) = 200$$

$$a = 10 \text{ or } 20$$

If green balls = 10

Then, red balls = 20

According to II statement,

Green balls = $(10 - B)$

Red balls = $(20 + B)$

According to III statement.

$$\frac{(10 - B)C_2}{30C_2} = \frac{7}{29}$$

$$\Rightarrow \frac{(10 - B)(9 - B) \times 2}{30 \times 29 \times 2} = \frac{7}{29}$$

$$\Rightarrow (10 - B)(9 - B) = 210$$

On solving, $B = -5, 24$

If green balls = 20

Then, red balls = 10

According to II statement

Green balls = $(20 - B)$

Red balls = $(10 + B)$

According to III statement

$$\frac{(20 - B)C_2}{30C_2} = \frac{7}{29}$$

$$\Rightarrow (20 - B)(19 - B) = 210$$

$$\Rightarrow B = 5, 34$$

But $0 < B \leq 20$

So, $B = 5$

But $0 < B \leq 10$

So, in bag Y:

Green balls = 15

Red balls = 15

After statement IV:

Number of green balls in bag Y = $(15 - C)$

Number of red balls in bag Y = $(15 + C - 5) = (10 + C)$

Atq,

$$= \frac{(10 + C)C_2}{25C_2} = \frac{2}{5}$$

$$\Rightarrow C = 6, -25$$

But $C \neq -25$

So, $C = 6$

48. (a): Value of $A = 10$

49. (d): Required probability = ${}^{20}C_2 / {}^{30}C_2 = \frac{38}{87}$

50. (b): Value of $C = 6$

Sol (51-54):

Since, tank is open.

So, painted area of tank = $2(ab + 50 \times b + 50 \times a) \text{ sq. unit}$

$$22640 = 2 \times 2(ab + 50 \times b + 50 \times a)$$

$$\Rightarrow (ab + 50 \times b + 50 \times a) = 5660$$

Let water supplied by pipe - C in a minute be $100x \text{ lit.}$

So, capacity of tank = $7 \times 60 \times 100x$

$$= 42000x \text{ lit}$$

51. (e): Units of electricity consumed = $\frac{1400}{5}$

$$= 280 \text{ units}$$

$$\text{Units consumed by each pipe} = \frac{280}{2}$$

$$= 140 \text{ units}$$

Now, each of pipe - B & C supplied water for 140 minutes.

Water supplied by pipe - C in 140 minutes =

$$100x \times 140$$

$$= 14000x \text{ liters}$$

$$\text{So, part of tank filled by pipe - C} = \frac{14000x}{42000x}$$

$$= \frac{1}{3}$$

$$\text{Hence, part of tank filled by pipe - B} = 1 - \frac{1}{3}$$

$$= \frac{2}{3}$$

Water supplied by pipe - B in 140 minutes =

$$140 \times 300$$

$$= 42000 \text{ liters}$$

$$\text{Hence, water supplied by pipe - C} = 42000 \times \frac{1}{2}$$

$$= 21000 \text{ liters}$$

52. (c): ATQ, $(70 \times b) + (50 \times b) + (50 \times 70) = 5660$

$$\Rightarrow 120b = 2160$$

$$\Rightarrow b = 18 \text{ unit}$$

So, volume/capacity of the tank = $70 \times 18 \times 50$

$$= 63000 \text{ cu. unit or } 63000 \text{ liters}$$

53. (e): Part of tank filled by pipe - C in 60 minutes =

$$\frac{60 \times 100x}{42000x} = \frac{1}{7}$$

$$\text{Part of tank filled by pipe - A} = 1 - \frac{1}{7}$$

$$= \frac{6}{7}$$

Tank filled by pipe - A in 60 minutes = 60×600

$$= 36000 \text{ liters}$$

$$\text{Total capacity of tank} = 36000 \times \frac{7}{6}$$

$$= 42000 \text{ liters}$$

$$\text{Efficiency of pipe - C} = \frac{42000 - 36000}{60}$$

$$= 100 \text{ lit/min}$$

$$\text{Required time} = \frac{42000}{600 + 300 + 100}$$

$$= 42 \text{ minutes}$$

54. (e): Total capacity of tank = $200 \times 420 = 84000$ liters
 Total time for which all 3 pipe worked =

$$\frac{84000}{600+300+200}$$

$$= \frac{840}{11} \text{ minutes}$$
 Each pipe worked for $\frac{840}{11}$ minutes
 Cost of electricity per pipe = $5 \times \frac{840}{11}$ Rs
 Total cost of electricity = $3 \times 5 \times \frac{840}{11}$
 = Rs.1145.45
 \approx Rs.1145 (approx.)

Sol. (55-58):

When shopkeeper picked up a shoe then probability of being it sport shoe,

$$\frac{Y}{16+X+Y} = \frac{6}{19}$$

$$13Y - 6X = 96 \text{ ----- (i)}$$

And, when shopkeeper picked up a shoe then probability of being it formal shoe,

$$\frac{X}{16+X+Y} = \frac{5}{19}$$

$$14X - 5Y = 80 \text{ ----- (ii)}$$

From (i) & (ii) we get -

$$X = 10 \text{ \& } Y = 12$$

Given, cost price of a sneaker = P \$

Marked price of a sneaker = 1.4P \$

Selling price of a sneaker after two successive discounts =

$$1.4P \times \frac{80}{100} \times \frac{90}{100} = 1.008P \$$$

But, when shopkeeper would have allowed only one discount of 20%

$$\text{New selling price of a sneaker} = 1.4P \times \frac{80}{100} = 1.12P \$$$

ATQ,

$$1.12P - 1.008P = 8.4$$

$$P = 75 \$$$

$$\text{Original selling price of a sneaker shoe} = 1.008 \times 75 = 75.6 \$$$

$$\text{And new selling price of a sneaker shoe} = 1.12 \times 75 = 84 \$$$

$$U = 48 + 8.4 \times 3$$

$$U = 73.2 \$$$

$$\text{Wages received by son} = 84 \times 3 + 48 = \text{Rs } 300 \$$$

$$\text{Selling price of a formal shoe} = 75 \$ - 15 \$ = 60 \$$$

$$\text{Profit on a formal shoe} = (84 \$ - 75 \$) \times \frac{2}{3} = 6 \$$$

$$\text{Cost price of a formal shoe} = 60 \$ - 6 \$ = 54 \$$$

ATQ

$$75 \times \frac{(100-E)}{100} = 54$$

$$75 E = 2100$$

$$E = 28\%$$

$$\text{Total profit earned on selling all sneaker shoes} = 16 \times 9 = 144 \$$$

$$\text{Total profit earned by shopkeeper on selling formal shoes to man} = \frac{144}{240} \times 100 = 60\%$$

$$N = \frac{60}{6} = 10$$

$$\text{Total wages of man} = 900 + 60 \times 10 = 1500 \$$$

$$\text{Wages of his wife} = \$ 1200$$

$$\text{Per day wages of his wife} = \frac{1200}{12} = \text{Rs } 100/\text{day}$$

Ratio of profit share of man to that of his wife

$$\frac{900 \times A}{1200 \times B} = \frac{15}{16}$$

$$\frac{A}{B} = \frac{5}{4}$$

Let the efficiency of man, his wife and son be M units/day,

W units/day and S units/day respectively

$$\text{Then } \frac{M \times 12}{W \times 12} = \frac{1500}{1200} = \frac{5}{4}$$

$$\text{And } \frac{M \times 12}{S \times 12} = \frac{1500}{300}$$

$$M:S = 5:1$$

$$\text{So, } M:W:S = 5:4:1$$

$$\text{Total work} = (5 + 4 + 1) \times 12 = 120 \text{ units}$$

$$D = \frac{120}{5} = 24 \text{ days}$$

$$T = \frac{120}{4} = 30 \text{ days}$$

$$\text{Time taken by son alone to do that work} = \frac{120}{1} = 120 \text{ days}$$

$$B = 15 \text{ months}$$

$$A = \frac{15}{4} \times 5 = \frac{75}{4} \text{ months}$$

55. (a): From question,

Let person's age after 10 years be '8p' years.

Then his son's age after 10 years = 3p years

Let the present age of his mother be 'z' years

From I

$$z + 10 - 3p = 20$$

From II

$$\frac{8p-10}{3p-10} = \frac{6}{1}$$

$$p = 5$$

From III

$$\frac{3p-10}{z} = \frac{1}{5}$$

Any two of the given statements are sufficient to answer the questions.

56. (a): Distance covered in downstream = 75 km

Then distance covered in upstream = 50 km

From I:

Let speed of stream be x km/hr

Then speed of boat in still water = y km/hr

ATQ

$$\frac{\frac{75}{y+x}}{\frac{50}{y-x}} = \frac{9}{10}$$

$$5y - 5x = 3y + 3x$$

$$\frac{y}{x} = \frac{4}{1}$$

We can't solve further

From II:

Let speed of boat in upstream and speed of boat in still water be 4x km/hr and 7x km/hr respectively

$$\text{ATQ, } \frac{50}{4x} - \frac{75}{10x} = 4$$

$$x = 1.25$$

$$\text{Speed of boat in still water} = 7 \times 1.25 = \frac{35}{4} \text{ km/hr}$$

So, none of the above statements will give speed of boat in still water which is equal to (N) 10 km/h.

57. (d): Let the total work be 100 units

Work done by Chiru alone in 1 day is more than 4 units

Work done by Binny and Chiru together in 1 day = 6 units

⇒ work done by Binny alone in 1 day is less than 2 units

Maximum units of work done by Deep in 1 day = 3 units

So, Binny and Deep together will do less than 5 units in a day

So, required days (Z) will be greater than $\frac{100}{5} = 20$ days

58. (b): Price of copy = $30 \times \frac{100}{75} = \text{Rs } 40$

From I:

Let the number of pens be x

Then number of copies = (x+2)

ATQ

$$40(x+2) + 30x = 360$$

$$7x = 28$$

$$x = 4$$

Total number of pens and copies = 10 = N

From II:

Let the number of copies and pens bought be x and y respectively

$$40x + 30y = 360$$

$$4x + 3y = 36 \dots \dots \dots (i)$$

And $40x + 30y - (40y + 30x) = \text{either } 20 \text{ or } 15$
i.e. $x - y = 2 \dots \dots \dots (ii)$ as $x - y = 1.5$ does not give integral solution

from (i) and (ii)

$$x = 6 \text{ and } y = 4$$

So, total number of pens and copies = 10

So, either I or II is sufficient.

Sol (59-61):

Hero:

Cycles

$$\text{Number of cycles sold} = \frac{180000}{2400} = 75$$

Let the number of cycles manufactured that remains unsold be 'x'

ATQ

$$18000 = 180000 - (75 + x) \times 1800$$

$$x = 15$$

Total number of cycles manufactured = 90

Cost incurred on manufacturing all cycles = Rs 1,62,000

$$\text{Profit\%} = \frac{18000}{162000} \times 100 = 11\frac{1}{9}\%$$

Bikes

Cost incurred in manufacturing a bike

$$= 1800 \times \frac{110}{9} = \text{Rs } 22,000$$

Let the total number of bikes manufactured be 'y'

$$\frac{250}{11} = \frac{2,40,000}{\frac{60}{100} \times 22000} \times 100$$

$$y = 80$$

$$\text{Number of bikes sold} = 80 \times \frac{60}{100} = 48$$

Total cost incurred in manufacturing all the bikes

$$= 80 \times 22,000 = \text{Rs } 17,60,000$$

$$\text{Profit on selling a bike} = \frac{2,40,000}{48} = \text{Rs } 5000$$

Selling price of a bike = Rs 27,000

Revenue generated on selling all bikes manufactured

$$= \text{Rs } 21,60,000$$

Total profits on selling all bikes = Rs 4,00,000

Honda:

Cycles

$$\text{Number of cycles manufactured} = 90 \times \frac{100}{125} = 72$$

Profit% = 180% = 22.5% of the profits earned on selling all manufactured bikes

$$\text{Profit} = \frac{22.5}{100} \times 4,80,000 = \text{Rs } 1,08,000$$

$$\text{Total cost incurred in manufacturing all cycles} = \frac{108000}{180} \times 100 = \text{Rs } 60,000$$

$$\text{Cost incurred in manufacturing a cycle} = \frac{60,000}{72} = \text{Rs } 833\frac{1}{3}$$

Revenue generated = Rs 1,68,000

$$\text{Selling price of a cycle} = \frac{168000}{72} = \text{Rs } \frac{7000}{3}$$

Bikes

$$\text{Revenue} = 64 \times 45000 = \text{Rs } 28,80,000$$

Total cost incurred on manufacturing all bikes = 28,80,000 - 4,80,000 = Rs 24,00,000

$$\text{Profit\%} = \frac{480000}{2400000} \times 100 = 20\%$$

$$\text{Cost price of a bike} = \frac{2400000}{64} = \text{Rs } 37500$$

59. (c): Cost incurred in manufacturing a cycle by

$$\text{Hero} = 1800 \times 0.75 = \text{Rs } 1350$$

$$\text{Total cost incurred} = (1350 \times 90 + 17,60,000) = \text{Rs } 18,81,500$$

$$\text{Total revenue generated} = 60 \times 2400 + 60 \times 27,000 = \text{Rs } 17,64,000$$

$$\text{Required loss} = \text{Rs } 1,17,500$$

60. (a): Quantity I: Required difference = 37500 - 22000 = Rs 15,500

$$\text{Quantity II: required sum} = 5000 + 7500 = \text{Rs } 12,500$$

So, Quantity I > Quantity II

61. (d): Required difference = (24,00,000 + 60,000) - (1,62,000 + 17,60,000) = Rs 5,38,000

Sol (62 – 65):

Let initial investment of Veer = $4p$

So, initial investment of Anurag will be = $4p \times 1.5 = 6p$

And, initial investment of Dharmendra = $4p \times 1.25 = 5p$

Initial investment of Deepak = $6p \times 1.5 = 9p$

Ratio of initial investment Veer, Anurag, Dharmendra and Deepak = $4 : 6 : 5 : 9$

Given, Sum of additional investment of all four at the end of third quarter = 180000 Rs.

Let additional investment of Veer at the end of third quarter = $5x$

So, additional investment of Anurag will be at the end of third quarter = $5x \times \frac{60}{100} = 3x$

And, additional investment of Dharmendra at the end of third quarter = $3x \times \frac{4}{3} = 4x$

Additional investment of Deepak at the end of third quarter = $3x \times \frac{200}{100} = 6x$

Additional investment of Veer at the end of third quarter = $180000 \times \frac{5x}{18x} = 50000$ Rs.

Additional investment of Anurag at the end of third quarter = $180000 \times \frac{3x}{18x} = 30000$ Rs.

Additional investment of Dharmendra at the end of third quarter = $180000 \times \frac{4x}{18x} = 40000$ Rs.

Additional investment of Deepak at the end of third quarter = $180000 \times \frac{6x}{18x} = 60000$ Rs.

Also, additional investment of Deepak at the end of second quarter = $60000 \times \frac{1}{2} = 30000$ Rs.

Additional investment of Dharmendra at the end of second quarter = $30000 \times \frac{100}{150} = 20000$ Rs.

Additional investment of Anurag at the end of second quarter = $30000 \times \frac{1}{0.75} = 40000$ Rs.

Additional investment of Veer at the end of second quarter = $40000 \times 1.5 = 60000$ Rs.

Additional investment of Dharmendra at the end of first quarter = $20000 \times 1.5 = 30000$ Rs.

Additional investment of Veer at the end of first quarter = $30000 \times \frac{3}{3} = 30000$ Rs.

Additional investment of Anurag at the end of first quarter = $30000 \times \frac{4}{3} = 40000$ Rs.

Additional investment of Deepak at the end of first quarter = $30000 \times \frac{6}{3} = 60000$ Rs.

Given, Veer invest additional 75% of his initial investment at the end of first quarter

So, initial investment of Veer = $30000 \times \frac{100}{75} = 40000$ Rs.

Initial investment of Anurag = $40000 \times \frac{6}{4} = 60000$ Rs.

Initial investment of Dharmendra = $40000 \times \frac{5}{4} = 50000$ Rs.

Initial investment of Deepak = $40000 \times \frac{9}{4} = 90000$ Rs.

Persons	Initial Investment (in Rs.)	Investment at the end of first quarter (in Rs.)	Investment at the end of second quarter (in Rs.)	Investment at the end of third quarter (in Rs.)
Veer	40000	30000	60000	50000
Anurag	60000	40000	40000	30000
Dharmendra	50000	30000	20000	40000
Deepak	90000	60000	30000	60000

62. (d): Ratio of profit share of Veer, Anurag and Deepak = $[(4 \times 4) + (3 \times 3) + (6 \times 2) + (5 \times 1)] : [(6 \times 4) + (4 \times 3) + (4 \times 2) + (3 \times 1)] : [(9 \times 4) + (6 \times 3) + (3 \times 2) + (6 \times 1)]$
= 42 : 47 : 66

63. (a): Ratio of profit share of Veer, Deepak and Ayush = $[(40000 \times 12) + (30000 \times 9) + (60000 \times 6) + (50000 \times 3)] : [(90000 \times 12) + (60000 \times 9) + (30000 \times 6) + (60000 \times 3)] : [(5x \times 6) + (5x + 20000) \times 6]$
= 1260000 : 1980000 : (60x + 120000)

ATQ –

$$\frac{60x + 120000}{(1260000 + 1980000)} = \frac{28000}{108000}$$

$$\frac{60x + 120000}{3240000} = \frac{7}{27}$$

$$60x = 840000 - 120000$$

$$60x = 720000$$

$$x = 12000 \text{ Rs.}$$

Investment of Ayush for second half = $(5x + 20000) = (5 \times 12000 + 20000) = 80000$ Rs.

64. (a): Ratio of profit share of Veer, Anurag, Deepak and Dharmendra = $[(4 \times 4) + (3 \times 3) + (6 \times 2) + (5 \times 1)] : [(6 \times 4) + (4 \times 3) + (4 \times 2) + (3 \times 1)] : [(9 \times 4) + (6 \times 3) + (3 \times 2) + (6 \times 1)] : [(5 \times 4) + (3 \times 3) + (2 \times 2) + (4 \times 1)]$
= 42 : 47 : 66 : 37

$$\text{Required percentage} = \frac{5}{42} \times 100 = 11.90 = 12\%$$

65. (c): Ratio of profit share Veer, Anurag, Dharmendra and Deepak at the end of fifth quarter = $[(4 \times 5) + (3 \times 4) + (6 \times 3) + (5 \times 2) + (5 \times 1)] : [(6 \times 5) + (4 \times 4) + (4 \times 3) + (3 \times 2) + (7 \times 1)] : [(5 \times 5) + (3 \times 4) + (2 \times 3) + (4 \times 2) + (6 \times 1)] : [(9 \times 5) + (6 \times 4) + (3 \times 3) + (6 \times 2) + (10 \times 1)]$
= 65 : 71 : 57 : 100

Let total profit of Veer, Anurag, Dharmendra and Deepak at the end of fifth quarter = 293x

$$\text{Given, } 293x = 234400$$

$$x = 800 \text{ Rs.}$$

$$\text{Required difference} = 100x - 65x = 35x$$

$$= 35 \times 800 = 28000 \text{ Rs.}$$

Sol (66-70):

Ratio of amount invested by A and C in scheme 'X' and in 'Z' is same that is 1 : 2

Let C and A invested 2a and a in scheme 'Z'

⇒ Amount invested by B in scheme 'Z' is (2a - 10,000)

Ratio of profit share of A and B in scheme 'Z' is 3 : 4 while time of investment of A and B in scheme 'Z' is 4 : 3.

$$\Rightarrow \frac{3}{4} = \frac{a \times 4}{(2a - 10,000) \times 3}$$

$$\Rightarrow 18a - 90,000 = 16a$$

$$a = 45,000$$

Scheme	Amount Invested by A	Amount invested by B	Amount invested by C
Z	45,000	80,000	90,000

In scheme Z,

C invested for ten months while A got 25% of profit out of total profit

If ratio between A and B profit share is 3 : 4, then C profit share is $\frac{3}{25} \times 100 - 7$

$$= 5$$

⇒ Ratio of profit share of A, B and C is 3 : 4 : 5.

Let A invested for 'd' month

$$\frac{90,000 \times 10}{45,000 \times d} = \frac{5}{3}$$

$$\Rightarrow d = 12 \text{ months}$$

$$B \text{ invested for} = \frac{12}{4} \times 3 = 9 \text{ months}$$

Time of investment of A in scheme 'X' is two months less than that of in scheme 'Z'

⇒ A invested for ten months in scheme 'X'.

Time of investment of B in scheme 'X' is five months more than time for which A invested in same scheme.

⇒ B invested for 15 months in scheme 'X'

Let amount invested by A in scheme 'Y' is = 5x

$$\Rightarrow \text{Amount invested by A in scheme 'X' is} = \frac{5x}{5} \times 3 = 3x$$

$$\text{And, Amount invested by B in scheme 'Y' is} = 5x \times \frac{96}{100} = 4.8x$$

$$\text{Amount invested by C in scheme 'Y' is} = 4.8x + 50,000$$

$$\text{Amount invested by C in scheme 'X' is} = 3x \times 2 = 6x$$

ATQ,

$$\frac{6x}{4.8x + 50,000} = \frac{15}{22}$$

$$\Rightarrow 132x = 72x + 750,000$$

$$x = 12,500 \text{ Rs.}$$

Amount Invested			
Scheme	A	B	C
X	37,500	40,000	7,50,00
Y	62,500	60,000	1,10,000
Z	45,000	80,000	90,000

Let, C invested for 't' month in scheme 'X'.

ATQ,

$$\frac{1}{4} = \frac{37,500 \times 10}{37,500 \times 10 + 40,000 \times 15 + 750,00 \times t}$$

$$\Rightarrow t = 7 \text{ months}$$

Time of investment of B and C is same in scheme 'Y' and ratio between profit sharing of C to total profit in scheme 'Y' is 1 : 2.

Let, B and C invested for '5t' months and A invested for 'x' month in scheme Y respectively.

ATQ,

$$\frac{1}{1} = \frac{1,10,000 \times 5t}{625,00 \times 16 + 60,000 \times 5t}$$

$$\Rightarrow 625,00 \times 16 = 50,000 \times 5t$$

$$\Rightarrow 5t = 20 \text{ months}$$

So, B and C invested in scheme 'Y' for 20 months

Scheme	Amount Invested by A	Time	Amount invested by B	Time	Amount invested by C	Time
X	37500	10 months	40,000	15 months	75,000	7 months
Y	625,00	16 months	60,000	20 months	1,10,000	20 months
Z	45,000	12 months	80,000	9 months	90,000	10 months

66. (e): Interest earned by B = $60,000 \times \frac{120}{100} \times \frac{120}{100} - 60,000 = 26,400 \text{ Rs.}$

Interest earned by C = $1,10,000 \times 2 \times \frac{25}{100} = 5,50,00 \text{ Rs.}$

Required difference = $5,50,00 - 26,400 = 28,600 \text{ Rs.}$

67. (b): Ratio of profit sharing between A, B and C in scheme 'X' and scheme 'Z' is 5 : 8 : 7 and 3 : 4 : 5 respectively.

Profit earned by A from scheme 'Z' = $\frac{14,490}{5} \times 3 = 8,694 \text{ Rs.}$

Profit earned by C from scheme 'X' = $\frac{14,490}{9} \times 4 = 6,440 \text{ Rs.}$

Profit earned by A from scheme 'X' = $\frac{6,440}{7} \times 5 = 4,600 \text{ Rs.}$

Total profit earned by A from scheme 'X' and 'Z' together = $8,694 + 4,600 = 13,294 \text{ Rs.}$

68. (d): Time of investment of A = 16 months

Interest earned by A = $62,500 \times \frac{15}{100} \times \frac{16}{12} = 12,500 \text{ Rs.}$

69. (a): Required % = $\frac{90,000 - 37,500}{37,500} \times 100 = 140\%$

70. (c): Initially ratio of profit sharing between A, B and C in scheme 'X' is 5 : 8 : 7

Let total profit = 20a

C profit = $\frac{7a}{20a} \times 100 = 35\%$

When B doubles his investment then ratio of profit sharing between A, B and C in scheme 'X' is 5 : 16 : 7

Let total profit = 28p

$$C \text{ profit} = \frac{7p}{28p} \times 100 = 25\%$$

$$\% \text{ Decrement in profit percent} = \frac{35-25}{35} \times 100 = 28\frac{4}{7}\%$$

71. (a): Total cost on cash down of 25,000 = 25,000 + 24,000 = Rs 49,000

Total cost on cash down of 18,000 = 18,000 + 36,000 = Rs 54,000

So, scheme first is better.

72. (a): Total cost on down payment of 25,000 = 25,000 + 24,000 = Rs 49,000

Total cost on down payment of 18,000 = 18,000 + 36,000 = Rs 54,000

Required answer = 5000/49,000 which is approximately equal to 10.2%

73. (b): For the second installment scheme he has to borrow Rs 6000. Hence, his monthly repayment will be Rs 600 per month towards the money lender and Rs 1000 per month towards the bike dealer. Hence, the total repayment will be Rs 1600 per month.

For the first installment scheme he will have to borrow Rs 13000, which will entail a monthly.

Repayment of Rs 1408.33 per month to the money lender. (13,000+3900 to be repaid in 12 monthly installment.) Besides, he also has to pay Rs 1000 per month towards the bike dealer. Hence, the total repayment will be Rs 2408.33 per month. This is outside his monthly limit of Rs 2000 repayment per month. Hence he has to go for the second scheme.

Sol (74-78):

	Horses	Cars	Land (in acres)
A	$\frac{Q}{3}$	$\frac{R}{5}$	
B	$\frac{2Q}{3} - 15$	$\frac{R}{2}$	5l
C	8	$\frac{R}{5}$	2l
D	7	$\frac{R}{10}$	4l

Let the acre of land received by C be 2l.

Now,

ATQ,

$$\frac{R}{2} - \frac{R}{10} = 20$$

or, R = 50

Hence, total no. of cars = 50

Also,

$$\frac{Q}{3} + 8 = \frac{3}{2} \left(\frac{2Q}{3} - 15 + 7 \right)$$

$$\text{or, } 2(y + 8) = 3(2y - 8)$$

$$\text{or, } Q = 30$$

Hence, total no. of horses = 30

B's total wealth = $2 \times 25 \times Y = 50Y$

B's wealth on account of land = $50Y - (25Y + 5X) = (25Y - 5X)$

or, $5lZ = (25Y - 5X)$

Hence, $2lZ = (10Y - 2X)$

And $4lZ = (20Y - 4X)$

Total wealth of A and C = Total wealth of B and D

Wealth of A + $(8 \times X + 10 \times Y + (10Y - 2X))$

= $50Y + (7 \times X + 5 \times Y + (20Y - 4X))$

So, wealth of A = $(55Y - 3X)$

Wealth of A on account of land = $(55Y - 3X) - (10 \times X + 10 \times Y) = (45Y - 13X)$

ATQ

$$\{(25Y - 5X) + (20Y - 4X) - (45Y - 13X)\} = 80,000$$

$$X = 20,000$$

And,

$$50Y - (55Y - 3X) = 20,000$$

$$3X - 5Y = 20,000$$

$$Y = \text{Rs } 8,000$$

74. (a): Difference = 3,80,000 - 2,60,000 = Rs 1,20,000

75. (a): Value of B's Cars = $25 \times 8000 = 200000 = 2 \text{ lakh}$

Value of A's horses = $10 \times 20000 = 200000 = 2 \text{ lakh}$

So, B can exchange his horses with A.

$$\begin{aligned} \text{76. (c): Req. \%} &= \frac{(400000 - 260000)}{400000} \times 100 \\ &= \frac{140000}{400000} \times 100 = 35\% \end{aligned}$$

$$\text{77. (b): } R/5 = 10$$

$$\text{78. (a): Required ratio} = \frac{20000}{8000} = 5:2$$

Solution (79-83):

Volume of hollow spherical toy = 33,957 cm³

Let Outer radius of hollow spherical toy = R

Inner radius of hollow spherical toy = $\frac{R}{2}$

ATQ,

$$\frac{4}{3} \pi \left(R^3 - \left(\frac{R}{2} \right)^3 \right) = 33,957$$

$$\Rightarrow R^3 = 9261$$

$$\Rightarrow R = 21$$

Outer radius of hollow spherical toy = 21 cm

Inner radius of hollow spherical toy = 10.5 cm

Volume of conical toy

$$= \frac{33957}{5.25} = 6468 = \pi(\text{radius of cone})^2 \times \frac{14}{3}$$

$$\Rightarrow \text{Radius of cone} = 21 \text{ cm}$$

$$\text{Volume of solid cylindrical toy} = \frac{6468}{3} = 2156 =$$

$$\pi(\text{radius of cylinder})^2 \times (\text{height of cylinder})$$

$$\Rightarrow \text{Radius of Cylinder} = 7 \text{ cm}$$

$$\text{Radius of Solid Spherical toy} = \frac{21}{2} = 10.5 \text{ cm}$$

Outer Radius of hollow cylindrical toy = 10.5 cm

Inner radius of hollow cylindrical toy
 $= 7 \times 2 - 10.5 = 3.5\text{cm}$

Toy	Radius	Height	Volume
Conical	21cm	14cm	6468
Solid Cylindrical	7cm	14cm	2156
Solid Spherical	10.5 cm		
Hollow Cylindrical	Inner = 3.5cm, Outer = 10.5cm	14cm	
Hollow Spherical	Inner = 10.5cm, Outer = 21cm		

Let total number of toys = $100x$

ATQ,

Number of solid spherical toys = $20x$

Number of hollow cylindrical toys = $40x$

ATQ,

$$40x - 20x = 20$$

$$\Rightarrow x = 1$$

Let Number of conical toys = $2y$

Number of hollow spherical toys = $5y$

Number of solid cylindrical toys = $3y$

ATQ,

$$2y + 5y + 3y = 100 - 40 - 20 = 40$$

$$\Rightarrow y = 4$$

Toy	Number of toys
Conical	8
Solid Cylindrical	12
Solid Spherical	20
Hollow Cylindrical	40
Hollow Spherical	20

79. (a): Space taken by one solid spherical toy = Volume of one solid spherical toy

$$= \frac{4}{3}\pi(10.5)^3 = 4851\text{cm}^3$$

Total space taken by solid spherical toys

$$= 20 \times 4851 = 97020\text{cm}^3$$

80. (e): Number of conical toys Neeraj have = 8

81. (b): Curved surface area of one hollow cylindrical toy
 $= 2\pi \times (3.5 + 10.5) \times 14 = 1232\text{cm}^2$

83. (c): Required Ratio = $\frac{21}{7} = \frac{3}{1}$

80. (d): Volume of one hollow cylindrical toy = $\pi \times 14 \times (10.5^2 - 3.5^2) = 4312$

$$\text{Required difference} = 4312 - 2156 = 2156\text{cm}^3$$

Previous Years' Questions of Prelims

Directions (1-5): - Deepak, Dharam and Shivam invested in partnership for one year. Ratio of investment of Deepak, Dharam and Shivam for first 6 months, next four month and for remaining time is 3:2:3, 2:5:3 and 4:3:3 respectively. Amount invested by Deepak in first 6 months, Dharam in next four month and by Shivam in remaining time is Rs.1500, Rs. 2000 and Rs. 900 respectively. Total difference between profit share of Dharam and Shivam together and Deepak and Dharam together is Rs. 450.

- Total investment of Deepak is approximately what percent of total investment of Shivam in one year?
 (a) 96% (b) 95% (c) 97% (d) 92% (e) 99%
- What is profit share of Dharam after one year?
 (a) Rs.7110 (b) Rs. 6570 (c) Rs. 7020 (d) Rs. 6560 (e) Rs. 7220
- What is the ratio of investment made by Deepak for 4 months to investment made by Shivam for 2 months?
 (a) 5:7 (b) 6:7 (c) 4:5 (d) 8:9 (e) 3:2
- What is the difference between investment made by Dharam for 6 months and 4 months together and total investment made by Shivam?
 (a) Rs. 900 (b) Rs. 600 (c) Rs. 800 (d) Rs. 400 (e) Rs. 500
- Investment made by Deepak for 2 months is how much percent more or less than investment made by Shivam for 6 months?
 (a) 20% more (b) 25% less (c) 25% more (d) 20% less (e) None of these.

Direction (6-10): There are three persons A, B and C who each invested in two different scheme S_1 and S_2 . A invested Rs 80,000 for 2 yr in scheme S_1 and 30,000 for 4 years in scheme S_2 . B invested Rs 30,000 for 3year in S_1 and he did not invest in scheme B. B also obtained a profit of 10,000 by selling his car. C invested Rs 50000 for 5 years in scheme S_1 and 10000 for 3 year in scheme S_2 . Total profit obtained from scheme S_1 is 2 lakh and scheme S_2 is 90,000.

- What is the ratio of total profit obtained by B and profit obtained by C from scheme S_1
 (a) 23 : 47 (b) 54 : 47 (c) 36 : 43 (d) 23 : 50 (e) 27 : 50
- Profit obtained by A from scheme S_1 is what percent of profit obtained by C from scheme S_2 .
 (a) $346\frac{7}{9}\%$ (b) $347\frac{8}{9}\%$ (c) $356\frac{7}{9}\%$ (d) $345\frac{4}{9}\%$ (e) $355\frac{5}{9}\%$

8. If sum of investment of A in both schemes and total profit obtained by A from both scheme is invested at compound Interest at the rate of 20% p.a. then find the total compound interest obtained in 2 yr
 (a) 108240 (b) 104206 (c) 105208 (d) 109280 (e) 106220
9. What is the average of profit attained by A from scheme S1 and profit of C obtained from scheme S2.
 (a) 41000 (b) 42000 (c) 44000 (d) 55000 (e) 40000
10. If A had invested his sum at Simple Interest for 3 yr at the rate of R% p.a. instead in scheme S₁ and B has invested his sum at compound Interest at (R + 5%) p.a. for 1 year and difference in interest obtained is 30,000 then find value of R%.
 (a) 10% (b) 9% (c) 15% (d) 18% (e) 12%

Directions (11-15) :- Study the following paragraph and answer the question.

Four friends A, B, C and D have total Rs 54000 and they invest in 4 different schemes. A invests Rs 12000 for 4 years at SI at 15% per annum. C invests Rs 20000 for 3 years at 10% compounded annually. B invests Rs 15000 at rate of 12.5% per annum at SI and he earned interest of Rs 9375. D invest the remaining amount for 1.5 years compounded half yearly and received total amount of Rs 9317.

11. Find B invests for how much time?
 (a) 3 years (b) 2 years (c) 5 years (d) 4 years (e) 6 years
12. What is total amount received by A after 4 years?
 (a) Rs 9200 (b) Rs 15200 (c) Rs 7200 (d) Rs 19200 (e) Rs 16200
13. What is the rate of interest per year at which D invests?
 (a) 15% (b) 20% (c) 5% (d) 25% (e) 10%
14. Interest earned by C is how much more/less than that of A?
 (a) Rs 580 (b) Rs 460 (c) Rs 520 (d) Rs 560 (e) Rs 640
15. Interest earned by B is approximately what percent of interest earned by A?
 (a) 120% (b) 110% (c) 75% (d) 150% (e) 130%

Directions (16-20): Paragraph given below gives information about investment of three persons A, B and C and their time of investment. Read the paragraph carefully and answer the following questions.

B invest Rs. 2500 for $\frac{2}{3}$ rd of total time of investment and ratio of profit sharing of B to C is 25:27. A invested for $\frac{4}{5}$ th of total time and got $\frac{3}{16}$ th of total profit and C invested for all 15 months. Total profit share of A and C is Rs. 1053.

16. What will be the rate of simple interest if we assume investment of C as principle and profit share of B as S.I. and time is 10 months?
 (a) 32% (b) 32.4% (c) 45% (d) 42% (e) 40%
17. What is the ratio of profit share of A to C?
 (a) 10:27 (b) 4:9 (c) 5:9 (d) 13:27 (e) 8:27
18. Total investment of A, B and C together is how much percent more than investment of B?
 (a) 212% (b) 108% (c) 112% (d) 180% (e) None of these.
19. What is the ratio of profit share of A and C together to profit share of B?
 (a) 25:39 (b) 39:25 (c) 16:21 (d) 21:16 (e) None of these.
20. What is the difference between 150% of investment of B and 200% of profit share of B and C together?
 (a) Rs.1404 (b) Rs. 832 (c) Rs. 1204 (d) Rs. 992 (e) Rs. 942

Previous Years' Solutions of Prelims

Sol (1-5): -

Investment of Deepak for first 6 months = Rs. 1500

Investment of Dharam for first 6 months = $1500 \times \frac{2}{3}$
= Rs. 1000

Investment of Shivam for first 6 months = $1500 \times \frac{3}{3}$
= Rs. 1500

Investment of Dharam for next 4 months = Rs. 2000

Investment of Deepak for next 4 months = $2000 \times \frac{2}{5}$ = Rs. 800

Investment of Shivam for next 4 months = $2000 \times \frac{3}{5}$ = Rs. 1200

Investment of Shivam for remaining time = Rs. 900

Investment of Deepak for remaining time = $900 \times \frac{4}{3}$ = Rs. 1200

Investment of Dharam for remaining time = $900 \times \frac{3}{3}$ = Rs. 900

Profit share of Deepak, Dharam and Shivam

$(1500 \times 6 + 800 \times 4 + 1200 \times 2) : (1000 \times 6 + 2000 \times 4 + 900 \times 2) : (1500 \times 6 + 1200 \times 4 + 900 \times 2)$
 $\Rightarrow 73:79:78$

Let profit of Deepak, Dharam and Shivam are Rs.73x, Rs. 79x and Rs.78x respectively.

ATQ

$(79x + 78x - 79x - 73x) = 5x = \text{Rs. } 450$

$x = 90$

Profit share of Deepak = Rs. 6570

Profit share of Dharam = Rs. 7110

Profit share of Shivam = Rs. 7020

1. (c): Total investment of Deepak = $(1500 + 800 + 1200) = \text{Rs. } 3500$

Total investment of Shivam = $(1500 + 1200 + 900) = \text{Rs. } 3600$

Required percentage = $\frac{3500}{3600} \times 100 \approx 97\%$

2. (a): profit of Dharam after one year = $79 \times 90 = \text{Rs. } 7110$

3. (d): required ratio = 800:900
= 8:9

4. (b): required difference
= $(1500 + 1200 + 900) - (1000 + 2000) = \text{Rs. } 600$

5. (d): Required percentage
= $\frac{1500 - 1200}{1500} \times 100 = 20\% \text{ less}$

Solution (6-10)

Ratio of profit share of A, B and C is scheme S_1

$80000 \times 2 : 30000 \times 3 : 50000 \times 5$
 $16 : 9 : 25$

Profit share of A from Scheme $S_1 = \frac{16}{50} \times 200,000$
= 64000

Profit share of B from scheme $S_1 = \frac{9}{50} \times 200,000$
= 36000

Profit share of C from scheme $S_1 = \frac{25}{50} \times 20,000$
= 100,000

Ratio of profit share of A and C in scheme S_2
 $30,000 \times 4 : 10,000 \times 3$
 $12 : 3$

Profit share of A in scheme $S_2 = \frac{12}{15} \times 90000$
= 72000

Profit share of C in scheme $S_2 = \frac{3}{15} \times 90,000$

6. (c): Required ratio = $(36000 + 10000) : 100,000$
= 46 : 100
= 23 : 50

7. (e): Required % = $\frac{64000}{18000} \times 100$
= $\frac{3200}{9} \% = 355\frac{5}{9} \%$

8. (a): Total investment of A = $80,000 + 30,000$
= 110,000

Total profit of A = $64000 + 72000$
= 136000

Equivalent rate of Interest for 2 year at CI
= $20\% + 20\% + \frac{20 \times 20}{100}$
= 44%

Required CI = $\frac{44}{100} (136000 + 110000)$
= 108240

9. (a): Required average = $\frac{64000 + 18000}{2}$
= 41000

10. (c): $\frac{80000 \times R \times 3}{100} - 30000 \times \left(\frac{R+5}{100}\right) = 30,000$
 $2400R - 300R - 1500 = 30000$
 $8R - R - 5 = 100$
 $7R = 105$
 $R = 15\%$

Sol. (11-15)

Interest earned by A = $\frac{12000 \times 15 \times 4}{100} = \text{Rs } 7200$

Interest earned by C = $20000 \left[\left(1 + \frac{10}{100}\right)^3 \right] - 20000$
= $20000 \left[\frac{1331 - 1000}{1000} \right]$
= $20 \times 331 = \text{Rs } 6620$

11. (c): Let B invests for T years.

$$\text{So, } 9375 = \frac{15000 \times 12.5 \times T}{100}$$

$$T = \frac{9375}{150 \times 12.5} = 5 \text{ years}$$

12. (d): Total amount received by A after 4 years = principle + interest

$$\text{So, required sum} = 12000 + 7200 = \text{Rs } 19200$$

13. (b): Investment of D = $54000 - (12000 + 20000 + 15000)$

$$= 54000 - 47000 = \text{Rs } 7000$$

Let rate of interest for D be R% per annum

$$\text{So, } 9317 = 7000 \left(1 + \frac{R}{200}\right)^3$$

$$\frac{9317}{7000} = \left(1 + \frac{R}{200}\right)^3$$

$$\frac{1331}{1000} = \left(1 + \frac{R}{200}\right)^3$$

$$\frac{11}{10} = 1 + \frac{R}{200}$$

$$R = 20\%$$

14. (a): Required difference = $7200 - 6620$
= Rs 580

15. (e): Required percentage = $\frac{9375}{7200} \times 100$
= $\frac{3215}{24} \% = 130.21\% \approx 130\%$

Sol (16-20): - Total time of investment = 15 months

$$\text{Time of investment of A} = 15 \times \frac{4}{5} = 12 \text{ months}$$

$$\text{Time of investment of B} = 15 \times \frac{2}{3} = 10 \text{ months}$$

Let investment of C = Rs. x

ATQ

$$\frac{2500 \times 10}{x \times 15} = \frac{25}{27}$$

$$x = 1000 \times \frac{27}{15}$$

$$x = \text{Rs. } 1800$$

Total profit = Rs. 1728

$$\text{Profit of A} = 1728 \times \frac{3}{16} = \text{Rs. } 324$$

$$\text{Profit of B} = (1728 - 324) \times \frac{25}{52} = \text{Rs. } 675$$

$$\text{Profit of C} = (1728 - 324) \times \frac{27}{52} = \text{Rs. } 729$$

Let investment of A is Rs. a

ATQ

$$\frac{2500 \times 10}{a \times 12} = \frac{675}{324}$$

$$a = \text{Rs. } 1000$$

	Investment (in Rs.)	Time of investment (in months)	Profit (in Rs.)
A	1000	12	324
B	2500	10	675
C	1800	15	729

16. (c): Required rate of interest = $\frac{675 \times 100 \times 12}{10 \times 1800} = 45\%$

17. (b): Required ratio = $324 : 729 = 4 : 9$

18. (c): Required percentage = $\frac{1800 + 1000}{2500} \times 100 = 112\%$

19. (b): Required ratio = $(324 + 729) : 675$
= $1053 : 675 = 39 : 25$

20. (e): Required difference
= $\frac{150}{100} \times 2500 - 2 \times (675 + 729)$
= $3750 - 2808 = \text{Rs. } 942$

Previous Years' Questions of Mains

Directions (1-3): Read the given information carefully and answer the following questions.

An apple pie of radius R cm has to cut into X identical pieces, area of each piece was 0.77 cm^2 . But later on, it was found that 50% of pie was rotten so the remaining 50% was cut into $(X - 3)$ pieces with area of 0.616 cm^2 of each piece.

- Find out the value of X.
(a) 10 (b) 12 (c) 8 (d) 6 (e) None of these
- Find out the circumference of the original pie?
(a) $\frac{44}{25} \text{ cm}$ (b) $\frac{88}{25} \text{ cm}$ (c) $\frac{176}{25} \text{ cm}$ (d) $\frac{132}{25} \text{ cm}$ (e) none of these
- If initially, entire pie would have been cut into $(X + 3)$ identical pieces then what would have been area of each piece?
(a) 0.64 cm^2 (b) 0.56 cm^2 (c) 0.28 cm^2 (d) 0.42 cm^2 (e) None of these

Direction (4-6): Study the given passage carefully and answer the questions.

Rahul, Sandy and Sati invested in ratio 2 : 3 : 4. After 4 months Sandy added Rs. 1500 more in his investment and Rahul withdrew Rs. 800 from his investment. After six months more Sati added to his investment an amount equal to half of the investment done by Rahul in first four months and Sandy invested 50% more than the investment done by Sati in first 10 months whereas Rahul added to his investment an amount that is equal to investment done by Sandy in first four months. Ratio of profit of Sati to total profit at the end of year is given as 125 : 376.

4. Profit of Sandy is approximately what percent of total profit?
 (a) 64% (b) 48% (c) 72% (d) 68% (e) 42%
5. What is the difference between profit share of Rahul and Sandy if total profit is Rs.37,600?
 (a) 12,000 (b) 16,400 (c) 18,500 (d) 22,900 (e) 20,000
6. Veer have 250% more than initial investment of Sati for a year. Find total interest earned by him if he invested his amount in a scheme which offers 20% p.a. compound interest for 2 years?
 (a) Rs. 140 (b) Rs. 1500 (c) Rs. 1540 (d) Rs.1600 (e) Rs.1640

Directions (7-11): Three companies selling an article at different profit and discount. Company A gives discount% double of what company B gives. Profit percent of company C is 10 times of its discount %. Cost of article for A, B and C is Rs. 2000, Rs. 3000 and Rs. 2500 respectively. Profit % of A, B and C are in ratio 20 : 25 : 12. Discount % given by B is $\frac{100}{24}$ % more than that of C.

7. If difference of profit earned on one article by company A and C is Rs.1000. Then find the difference of M.P. of articles for them.
 (a) Rs.1600 (b) Rs.1750 (c) Rs.1500 (d) Rs.1400 (e) None of these
8. What is the total profit of all companies if M.P. of article for company B is Rs.12000 (in Rs)?
 (a) 12500 (b) 11500 (c) 12000 (d) 14500 (e) None of these
9. If ratio of S.P. of articles for company A to that of B is 5:9 then find the value of discount % given by company B.
 (a) 12.5% (b) 12% (c) 6.25% (d) 20% (e) 25%
10. M.P. of article sold by company A is what% of C.P. of article sold by company C if profit earned by C is Rs. 4500?
 (a) 512% (b) 412% (c) 312% (d) 488% (e) none of these

Direction (11-15): Study the passage and answer the following questions.

The age of Abhishek is one third of present age of his father & 5 years ago he was (A) of his father's age & his age will be 50 years after 5 yrs. Abhishek & his father invested in a business in ratio 2 : 3, respectively. Abhishek invested for 4 months & his fathers for (B) months. Out of total profit of Rs. 27200, profit share of Abhishek's father was Rs. 1600 more than profit share of Abhishek. Profit which Abhishek got, he invested half at SI for two years & half at CI for same period at (C)% and difference of interest obtained is Rs. 64. The amount which Abhishek's father obtained as profit he started manufacturing cycles. The labor cost of manufacturing is $\frac{1}{3}$ rd of profit & excluding labor cost there are two other cost i.e., raw material and transportation cost which is in ratio 3 : 2. With that amount he manufactured 10 cycles. If he wants 20% profit on selling all the cycles that he manufactured then selling price of single unit is (D). The cost of raw material of six cycles is (E).

11. Find the value in place of A?
 (a) $\frac{4}{11}$ (b) $\frac{3}{13}$ (c) $\frac{2}{13}$ (d) $\frac{4}{13}$ (e) $\frac{5}{7}$
12. Find the value in place of B?
 (a) 5 (b) 3 (c) 4 (d) 7 (e) 6
13. Find the value in place of C?
 (a) 10% (b) 20% (c) 25% (d) 40% (e) None of these
14. Find the value in place of D?
 (a) 2448 Rs (b) None of these (c) 1224 Rs (d) 1728 Rs (e) 2246 Rs
15. Find the value in place of E?
 (a) 3624 (b) 3456 (c) 3648 (d) 3424 (e) None of these

Directions (16-21): - Rahul goes to gym and runs 40 minutes on treadmill. For starting 15 minutes he runs at a uniform speed of 5 km/hr and after that he runs at a uniform speed of 9km/hr for remaining time. He runs total (A) km on treadmill. After that he comes to his house and get ready for office which is 45km away from his house. He reaches office in 1.5 hours at 9:30 a.m.

In office he gives some work to his subordinates P_1 and P_2 at **(B)**. P_1 can complete that work in 6 hours while efficiency of P_1 and P_2 is in the ratio 5 : 4. P_1 and P_2 together completes 75% of that work at 12:30 p.m. Rahul and P_2 together can complete same work in 3 hours. Rahul is **(C)%** more efficient than P_1 . After that work he comes back to home in upstream (Speed of stream is 3km/hr and his speed in still water and distance between his house and office are same as earlier). He takes **(D)** hours to reach home.

When he reaches home, two of his friends Aman and Raman come at his house. All three starts to play a game in which 2 dices are used by each person. **(E)** is the number of outcomes in which first Rahul and then Aman throw their respective dices. In a game, all three throw their dices and each one of them get 8 as the sum of numbers in their dices and any one of two not get same outcomes. Winner is the one who gets highest number as the sum of the square of the number comes in dices. **(F)** should be the outcomes of the dices of Raman if Raman is winner of the game.

16. What value will come at the place of 'A'?

- (a) 4.25 km (b) 3.75 km (c) 5 km (d) 5.25 km (e) None of the given options

17. What value will come at the place of 'B'?

- (a) 10:45 a.m. (b) None of the given options (c) 11 a.m. (d) 10:30 a.m. (e) 10 a.m.

18. What value will come at the place of 'C'?

- (a) $16\frac{2}{3}\%$ (b) 20% (c) 25% (d) $33\frac{1}{3}\%$ (e) 50%

19. What value will come at the place of 'D'?

- (a) 2 hours (b) 1.5 hours (c) $1\frac{7}{8}$ hours (d) $1\frac{2}{3}$ hours (e) $1\frac{4}{11}$ hours

20. What value will come at the place of 'E'?

- (a) 72 (b) 42 (c) 36 (d) 108 (e) 54

21. What value will come at the place of 'F'?

- (a) None of the given options (b) Cannot be determined
(c) 3 and 5 (d) 4 and 4 (e) 2 and 6

Direction (22-25): Study the data given below and answer the following questions

Data is provided for 3 months for a water tank whose capacity is 600000 L to provide continuous water supply to a building. Water tank is first completely filled and then it gets completely emptied to supply water in a building. It supply water continuously to the building and is refilled again and again to provide continuous supply. In the building there are 40 flats in which all flats may or may not be completely occupied in the given three months.

November → Each flat is filled with a tap from which rate of flow of water is 250 L/h and only 50% flats are occupied in November. Water tank provides continuous water supply to these taps in whole month.

December → In this month 30 flats are occupied and tank gets emptied after 4 $\frac{1}{2}$ days. Rate of flow from one tap in December is A % more or less than rate of flow from one tap in November.

January → Rate of flow of water from the taps is same as of November and gets emptied after supplying water to building for 100 hr. Number of flats occupied in January is B %

22. In November tank has to be filled how many times?

- (a) 5 (b) 6 (c) 8 (d) 7 (e) 9

23. What is the value of A%

- (a) 30% (b) 25% (c) $33\frac{1}{3}\%$ (d) 20% (e) 15%

24. What is the value of B%

- (a) 80% (b) 40% (c) 75% (d) 60% (e) 70%

25. In October efficiency of each tap decrease by 20% due to leakage as compared to efficiency of November and capacity of tank is reduced to 80%. In how many hours tank will be emptied in October if total occupied flats in October is equal to no. of occupied flats in December.

- (a) 65 hours (b) 70 hours (c) 30 hours (d) 60 hours (e) 80 hours

Directions (26 – 30): Read the following information carefully and answer the questions.

There are three types (i.e., A, B & C) of pipe having different efficiency to fill a tank individually. 'N' type-B pipes can fill the same tank in $2t$ hours and ' $1.5N$ ' type-A pipes can fill the same tank in t hours. ' $2N$ ' type-C pipes can fill the same tank in $3t$ hours. Eight pipes of each type together can fill the same tank in 22.5 hours. Nine type-A pipes can fill the same tank in $(t + 20)$ hours.

26. What is the value of $3t$.

- (a) 42 (b) 54 (c) 60 (d) 48 (e) 72

27. If thirty-six type-B pipes are opened and after four hours thirty type-B pipes are replaced by eight type-A pipes, then find the total time in which the tank will be filled completely.

- (a) 20.16 hours (b) 22.16 hours (c) 28.16 hours (d) 24.96 hours (e) 24.16 hours

28. Find the value of ' $1.5N$ '.

- (a) 18 (b) 21 (c) 15 (d) 24 (e) 12

29. When eight pipes of each type completely fill the tank, then what percentage of total capacity of the tank is filled by type C pipes.

- (a) 16% (b) 10% (c) 15% (d) 8.33% (e) 12.5%

30. If $(N - 6)$ type B pipes opened for $(t - 6)$ hours and $(N - 6)$ type A pipes opened for $(t - 10)$ hours in the tank, then in what time the remaining tank will be filled by $(N - 6)$ type C pipes?

- (a) $152\frac{2}{3}$ days (b) $148\frac{1}{3}$ days (c) 145 days (d) 154 days (e) 158 days

Direction (31 – 33): Read the data given below carefully and answer the questions.

A train running between four stations i.e. A, B, C & D on Monday and Tuesday. The average speed of train on Monday during whole journey is 50 kmph and average speed of train on Tuesday during whole journey is 62.5 kmph. On Monday train takes one hour less to cover distance between A and B as compare to that of on Tuesday. Train takes equal time to cover distance between B to C on both the given days, while train takes three hours more to cover distance between C and D as compare to that of on Tuesday. The distance between A and B is 40% less than that of between C and D. The distance between B and C is 50% more than that of between A and B.

Note - There is not any halt or stoppage from the station A to D.

31. Find the total time taken by train to cover distance from A to D on Tuesday?

- (a) 6 hours (b) 8 hours (c) 10 hours (d) 4 hours (e) 12 hours

32. Find the difference between the distance from station A to B and from station C to D?

- (a) 60 km (b) 20 km (c) 80 km (d) 40 km (e) Can't determined

33. On Monday speed of train between stations B to C is 50% more than speed of train between C to D and time taken to cover distance between B to C is 2 hours less than that of time taken between C and D. Find the speed of train between C to D on Monday?

- (a) 20 kmph (b) 60 kmph (c) 30 kmph (d) 50 kmph (e) 40 kmph

Direction (34 – 36): A man is going shop from his home with the speed of _____ kmph and time taken to reach the shop by him is _____ hours. After reaching there he purchases a cylindrical jar of certain height having capacity equal to 83259 cm^3 . The man also purchases a conical vessel whose capacity is $\frac{1}{27}$ th of cylindrical jar and height of conical vessel is 14 cm.

Note: Height of conical vessel is four times of the height of cylindrical jar.

34. Find the ratio of the radius of cylindrical jar to the radius of conical vessel?

- (a) 3 : 1 (b) 4 : 1 (c) 5 : 1 (d) 6 : 1 (e) 5 : 2

Directions (35– 36): The distance (in km) between the home and shop in numerical value is equal to seven more than $\frac{1}{3}$ rd of square root of $\frac{1}{11}$ th of the capacity of the cylindrical jar and the speed of the man is four times of the time taken by him to reach the shop.

35. Speed of man _____ kmph.

- (a) 12 (b) 15 (c) 10 (d) 8 (e) 18

36. Time taken to reach the shop by man is _____ hours.

- (a) 3.5 (b) 2 (c) 3 (d) 2.5 (e) 4

Previous Years' Solutions of Mains

1. (c): Total area of apple pie = $X \times 0.77 \text{ cm}^2$
 ATQ,
 $(X - 3) \times 0.616 \times 2 = X \times 0.77$
 $\Rightarrow X = 8$
2. (e): Radius of original pie be $R \text{ cm}$.
 Area of the pie = $8 \times 0.77 \text{ cm}^2$
 ATQ,
 $\pi R^2 = 8 \times 0.77$
 $\Rightarrow R = \frac{7}{5} \text{ cm}$.
 Required circumference = $2 \times \frac{22}{7} \times \frac{7}{5} = 8.8 \text{ cm}$
3. (b): Total area of entire pie = $0.77 \times 8 \text{ cm}^2$
 Required area of each piece = $\frac{0.77 \times 8}{11} = 0.56 \text{ cm}^2$

Direction (4-6):

Let investment of Rahul, Sandy and Sati be $2x$, $3x$ and $4x$ respectively.

Ratio of profit

Rahul	:	Sandy	:	Sati
$2x \times 4$:	$3x \times 4$:	$4x \times 10$
$+(2x - 800) \times 6$:	$+(3x + 1500) \times 6$:	$+(5x \times 2)$
$+(5x - 800) \times 2$:	$(9x + 1500) \times 2$:	
$30x - 6400$:	$48x + 12000$:	$50x$
ATQ,				

$$\frac{50x}{128x + 5600} = \frac{125}{376}$$

$$\Rightarrow x = 250$$

Ratio of profit share of Rahul, Sandy and Sati is

$$1100 : 24000 : 12500 \rightarrow 11 : 240 : 125$$

4. (a): Required percentage = $\frac{240}{376} \times 100$
 $= 63.829\% \approx 64\%$
5. (d): Required difference = $\frac{240 - 11}{376} \times 37600 = 22,900$
 $= 22,900$
6. (c): Investment of Veer
 $= 4 \times 250 \times \frac{350}{100} = 3500$
 Interest earned by Veer = $3500 \left[1 + \frac{20}{100} \right]^2 - 3500 = 1540$

Solutions (7-11)

Let profit% of A, B and C = $20x$, $25x$ and $12x$ respectively.

$$\text{Discount\% of company C} = \frac{12x}{10} = 1.2x\%$$

$$\text{Discount\% of company B} = \frac{25}{24} \times 1.2x = 1.25x\%$$

$$\text{Discount\% of company A} = 2.5x\%$$

7. (b): ATQ
 $\frac{2000 \times 20x}{100} - \frac{2500 \times 12x}{100} = 1000$
 $x = 10$
 M.P. for company A = $2000 \frac{(100+200)}{(100-25)} = 8000$
 M.P. for company C = $2500 \frac{(100+120)}{(100-12)} = 6250$
 Difference = 1750
8. (d): M.P. = 12000
 C.P. = 3000
 $3000 \frac{(100+25x)}{(100-1.25x)} = 12000$
 $x = 10$
 Total profit of company A = $\frac{2000 \times 200}{100} = 4000$
 Total profit of company B = $\frac{3000 \times 250}{100} = 7500$
 Total profit of company C = $\frac{2500 \times 120}{100} = 3000$
 Total profit = $4000 + 7500 + 3000 = 14500 \text{ Rs.}$
9. (e): ATQ
 $\frac{2000 \times (100+20x)}{3000 \times (100+25x)} = \frac{5}{9}$
 $x = 20$
 Discount % given by company B = $20 \times 1.25 = 25\%$
10. (a): Profit earned by C = 4500
 $= \frac{2500 \times 12x}{100} = 4500$
 $x = 15$
 M.P. of article sold by company A = $\frac{2000(100+20 \times 15)}{(100-2.5 \times 15)}$
 $= 12800$
 Required % = $\frac{12800}{2500} \times 100 = 512\%$
11. (d): Let present age of Abhishek father be x
 \therefore Present age of Abhishek = $\frac{x}{3}$
 $\therefore \frac{x}{3} + 5 = 50$
 $\therefore x = 135$
 \therefore age of father 5 yrs ago = 130
 \therefore age of Abhishek 5 yrs ago = $\frac{135}{3} - 5 = 40$
 $\therefore A = \frac{4}{13}$
12. (b): Let, Abhishek's share of profit be Rs. x
 Then, his father's share of profit is Rs. $x + 1600$
 ATQ, $x + x + 1600 = 27200$
 $\Rightarrow x = 12800$
 Hence, Abhishek's share of profit = Rs. 12800
 And his father's share of profit = Rs. 14400
 Now,
 $\frac{2 \times 4}{3 \times B} = \frac{12800}{14400} \Rightarrow B = 3$

13. (a): \therefore Profit of Abhishek = 12800

$$D = \frac{PR^2}{100^2}$$

$$64 = \frac{12800 \times R^2}{2 \times 100^2}$$

$$\therefore R = 10\%$$

14. (d): Profit share of Abhishek's father = Rs. 14400

Cost price of 10 cycles = 14400

Cost price of 1 cycle = $\frac{14400}{10}$ = Rs. 1440

Required selling price = $1440 \times \frac{120}{100} = 1728$ Rs.

15. (b): Cost of raw material of 10 cycles = $14400 \times \frac{2}{3} \times \frac{3}{5} = 5760$

Cost of raw material of 6 cycles = $\frac{5760}{10} \times 6 = 3456$

16. (c): Rahul runs for 15 minutes at a speed of 5 km/hr and 25 minutes at a speed of 9 km/hr

\therefore Total distance covered by Rahul on treadmill =

$$\frac{15}{60} \times 5 + \frac{25}{60} \times 9 = 1.25 + 3.75 = 5 \text{ km}$$

A = 5 km

17. (e): P_2 can complete work in = $6 \times \frac{5}{4} = 7.5$ hours

P_1 and P_2 together can complete total work in =

$$\frac{6 \times 7.5}{6 + 7.5} = \frac{45}{13.5} = 3\frac{1}{3} \text{ hours}$$

\Rightarrow

P_1 and P_2 together can complete 75% work in =

$$\frac{10}{3} \times \frac{75}{100} = 2.5 \text{ hours}$$

They finish work at 12:30 p.m.

\Rightarrow They start their work at 12:30 - 2:30 = 10 a.m.

B = 10 a.m.

18. (b): P_2 can complete work in = $6 \times \frac{5}{4} = 7.5$ hours

Rahul and P_2 can complete same work in 3 hours

$$\Rightarrow \text{Rahul can complete same work in} = \frac{1}{\frac{1}{3} - \frac{1}{7.5}} = \frac{1}{0.2} =$$

5 hours

Ratio of efficiency of Rahul and P_1 is 6 : 5

$$C = \frac{6-5}{5} \times 100 = 20\%$$

19. (d): Distance between his house and his office is 45 km

$$\Rightarrow \text{His speed} = \frac{45}{1.5} = 30 \text{ km/hr}$$

Speed of stream is 3 km/hr

$$\Rightarrow \text{Upstream speed of boat} = 30 - 3 = 27$$

$$\text{Time to reach home i.e., } D = \frac{45}{27} = 1\frac{2}{3} \text{ hours}$$

20. (a): Each friend has 2 dices so there are total 36 outcomes by one friend.

If either Rahul or Aman throw their dices, then there are total 36 + 36 outcomes

$$\text{So, } E = 36 + 36 = 72$$

21. (e): Sum of outcomes of dices should be 8 so it can be (4,4), (3,5) and (2,6)

In (4,4)

Addition of square of outcomes = $4^2 + 4^2 = 32$

In (3,5)

Addition of square of outcomes = $3^2 + 5^2 = 34$

In (2,6)

Addition of square of outcomes = $2^2 + 6^2 = 40$

Now Raman will win the game if he gets (2,6) and remaining two get (3,5) or (4,4)

So, option (e) is the correct answer

22. (b): Efficiency of tap = 250 L/h

In November there are total 30 days.

Total flats = 20

Let tank is refilled n times

So,

$$n \times 600000 = 250 \times 24 \times 30 \times 20$$

$$n = 6 \text{ hours}$$

23. (d): Total time in which tank gets emptied

$$= \frac{25}{6} \times 24 = 100 \text{ hours}$$

$$\text{So, Rate of flow} = \frac{600000}{30 \times 100} = 200 \text{ L/hour}$$

$$A\% = \frac{250-200}{250} \times 100 = 20\%$$

24. (d): Let n number of flats were occupied

$$x \times 250 \times 100 = 600000$$

$$x = 24 \text{ flats}$$

$$B\% = \frac{24}{40} \times 100 = 60\%$$

25. (e): Efficiency of a tap in October = $\frac{4}{5} \times 250 = 200$ l/hour

$$\text{New capacity of the tank} = \frac{4}{5} \times 600000 = 480000 \text{ l}$$

Occupied flats in October = 30

$$\text{Required time} = \frac{480000}{200 \times 30} = 80 \text{ hours}$$

Sol (26-30):

Let one type-B, one type-A and one type-C pipe can fill b, a and c units in one hour

From question

$$Nb \times 2t = 1.5aN \times t = 2Nc \times 3t$$

$$2b = 1.5a = 6c$$

$$\text{Let } 2b = 1.5a = 6c = m$$

So,

$$b : a : c = 3 : 4 : 1$$

Let one hour type B, type A and type C efficiency of 3u : 4u : u

$$\text{Total capacity of tank} = 22.5 \times 8(1b + 1a + 1c)$$

$$= 22.5 \times 8 \times (3u + 4u + u)$$

$$= 1440u \text{ units}$$

ATQ –

$$9 \times 4u (t + 20) = 1440u$$

$t = 20$ hours

$$\text{So, } N \times b \times 2t = 1440u$$

$$N \times 3u \times 2 \times 20 = 1440u$$

$$N = 12$$

26. (c): $3t = 3 \times 20 = 60$

27. (e): Tank filled by thirty-six type-B pipes in 4 hours = $36 \times 3u \times 4 = 432u$ units

Remaining capacity of tank = $1008u$ units

Now in one-hour tank filled by (36 - 30) type B pipe and 8 type A pipes = $6 \times 3u + 8 \times 4u = 50u$ units

$$\text{Required time} = \left(\frac{1008u}{50u} + 4 \right) \text{ hours} = 24.16 \text{ hours}$$

28. (a): Value of $1.5N = 12 \times 1.5 = 18$

29. (e): Required percentage = $\frac{u}{8u} \times 100 = 12.5\%$

30. (e): Total tank filled by (N - 6) type B pipes when opened for (t - 6) hours and (N - 6) type A pipes when opened for (t - 10) hours = $6 \times 3u \times 14 + 6 \times 4u \times 10$

$$= 252u + 240u$$

$$= 492u \text{ units}$$

Remaining capacity of tank = $1440u \text{ units} - 492u \text{ units}$

$$= 948u \text{ units}$$

$$\text{Required time} = \frac{948u}{6u} = 158 \text{ hours}$$

Sol. (31 - 33):

Given average speed of train on Monday during whole journey = 50 kmph

Or, Average speed of train on Tuesday during whole journey = $62.5 \text{ kmph} = \frac{125}{2} \text{ kmph}$

Let time taken by train on Monday from A to B = t hours

So, time taken by train on Tuesday from A to B = $(t + 1)$ hours

Time taken by train on each given day from B to C = u hours (given, train takes equal time to cover distance between B to C on both the given days)

And, time taken by train on Monday from C to D = v hours

Time taken by train on Tuesday from C to D = $(v - 3)$ hours

Let distance between C to D = $100x \text{ km}$

$$\text{So, distance between A to B} = 100x \times \frac{(100-40)}{100} = 60x \text{ km}$$

$$\text{And distance between B to C} = 60x \times \frac{150}{100} = 90x \text{ km}$$

$$\text{For Monday, } \frac{\text{distance (AB+BC+CD)}}{\text{Time}} = \text{Speed}$$

$$\text{For Monday, } \frac{(100x+60x+90x)}{(t+u+v)} = 50$$

$$\text{So, } t + u + v = 5x \text{ ----- (i)}$$

$$\text{For Tuesday, } \frac{(100x+60x+90x)}{(t+u+v-2)} = \frac{125}{2}$$

From (i) put the value of $(t + u + v)$ and we get –

$$\frac{250x}{(5x-2)} = \frac{125}{2}$$

$$x = 2$$

Now, distance between C to D = $100 \times 2 = 200 \text{ km}$

Distance between A to B = $60 \times 2 = 120 \text{ km}$

And, distance between B to C = $90 \times 2 = 180 \text{ km}$

31. (b): From above explanation

From (i) put the value of $(t + u + v)$ and we get –

$$(t + u + v - 2) = 5x - 2$$

Total required time by train to cover distance from A to D on Tuesday = $(5x - 2) = (5 \times 2 - 2) = 8 \text{ hours}$

32. (c): Required difference = $200 - 120 = 80 \text{ km}$

33. (e): Let Speed of train between C to D on Monday = $2s \text{ kmph}$

So, speed of train between B to C on Monday = $2s$

$$\times \frac{150}{100} = 3s \text{ kmph}$$

Let time taken by train to cover distance between B to C on Monday = x hours

So, time taken by train to cover distance between C to D on Monday = $x + 2$ hours

ATQ –

$$\text{For B to C on Monday} = \frac{180}{3s} = x$$

$$\text{Or } x = \frac{60}{s} \text{ ---- (i)}$$

$$\text{For C to D on Monday} = \frac{200}{2s} = x + 2$$

$$x = \frac{100}{s} - 2 = x \text{ ----- (ii)}$$

From (i) and (ii)

$$S = 20 \text{ kmph}$$

So, speed of train between C to D on Monday = 40 kmph

24. (d): Let volume of cylindrical jar = V

$$\text{So, volume of conical vessel} = \frac{V}{27}$$

We know volume of cylinder = $\pi r^2 h$

Let radius of conical vessel = R

Given, height of conical vessel is four times of the height of cylindrical jar

$$\text{So, required ratio} = \frac{V}{\frac{V}{27}} = \frac{\pi r^2 h}{\frac{1}{3} \pi R^2 4h}$$

$$= \frac{r^2}{R^2} = \frac{36}{1}$$

$$r : R = 6 : 1$$

Sol. (35– 36):

Let distance between home and shop be 'd' km

ATQ –

$$d = 7 + \frac{1}{3} \times \sqrt{\frac{1}{11} \times 83259}$$

$$d = 7 + \frac{1}{3} \times \sqrt{7569}$$

$$d = 7 + \frac{1}{3} \times 87$$

$$d = 36$$

let time taken by man = t

So, speed of man = 4t

$$4t \times t = 36$$

$$t^2 = 9$$

$$t = 3$$

And speed of man = $4 \times 3 = 12$ **35. (a):** Speed of man = $4 \times 3 = 12$ kmph**36. (c):** Time taken by man = 3 hours

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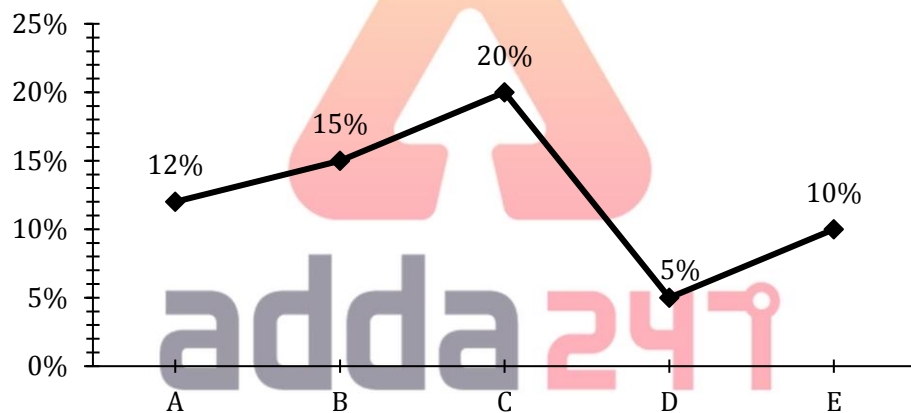
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Chapter 09

Arithmetic DI

Arithmetic DI are the type of representation in which the values of variables are represented in proportion with the distances with respect to a central point. This Graph is based on Arithmetic Concepts like Time and Distance, Profit and Loss, Time and Work, Boat and Stream, SI and CI, Boat and Stream, Mensuration and other topics. These are very important as in the recent Examinations we have seen these types of DI being asked frequently.

A key point to solve any Arithmetic DI is that to understand what had been given in DI. Then consider these as an individual separate questions from arithmetic, also these questions are way easier. Now let us consider example:



Look carefully, here a % graph is given and nothing have been mentioned.

Examiner may mention it “% of distance covered by these (A, B, C, D & E) individuals in 1 hour and total distance is 100 km” OR

“ % of work done by individuals in given time” OR

“Profit/loss % earned on selling these items for shopkeeper”

“Interest rate given by a bank to different individuals” or many other things.

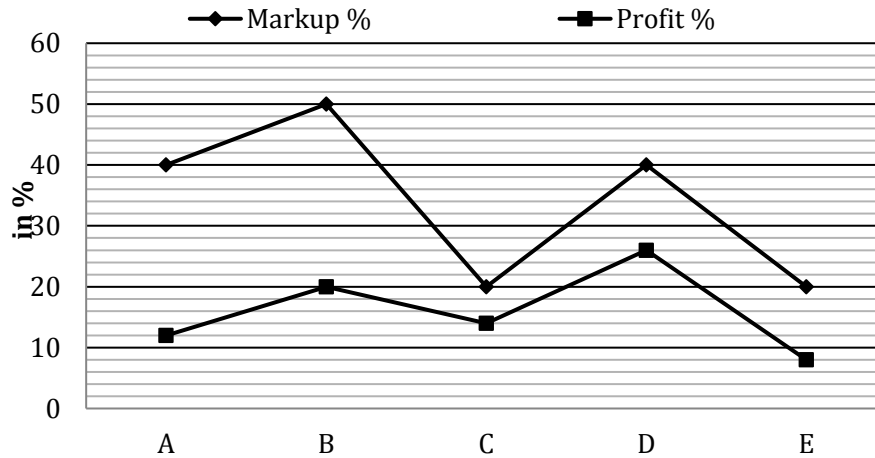
This chapter contains:

- Concept with Solved Examples
- Practice MCQs for Prelims
- Practice MCQs for Mains
- Previous Years’ Questions of Prelims
- Previous Years’ Questions of Mains

Solved Examples

Directions (1-5): Study the line chart given below and answer the following questions.

Line chart shows the markup percentage with respect to cost price and profit percentage of five articles.



1. If discount allowed on article-C & E is Rs.48 & Rs.120 respectively, then find ratio of selling price of article-C to selling price of article-E.

(a) 38 : 45 (b) 21 : 22 (c) 5 : 12 (d) 27 : 35 (e) 2 : 3

Sol. (a): Let C.P of article – C & E be Rs. 100x & Rs. 100y respectively.

Then,

$$\text{M.P. of article – C} = 100x \times \frac{120}{100} = \text{Rs. } 120x$$

$$\text{M.P. of article – E} = 100y \times \frac{120}{100} = \text{Rs. } 120y$$

Now,

$$\text{SP of article – C} = 100x \times \frac{114}{100} = \text{Rs. } 114x$$

$$\text{SP of article – E} = 100y \times \frac{108}{100} = \text{Rs. } 108y$$

ATQ,

$$120x - 114x = 48$$

$$x = 8$$

$$\text{And, } 120y - 108y = 120$$

$$y = 10$$

$$\begin{aligned} \text{So, required ratio} &= \frac{114x}{108y} = \frac{114 \times 8}{108 \times 10} \\ &= 38 : 45 \end{aligned}$$

2. If ratio of cost price of article-A to that of article-E is 1 : 2, then find difference between selling price of article-A & article-E is what percent of marked price of article-E?

(a) $40\frac{1}{3}\%$ (b) $48\frac{1}{3}\%$ (c) $35\frac{2}{3}\%$ (d) $43\frac{1}{3}\%$ (e) None of the above.

Sol. (d): Let cost price of article – A be Rs. 100x.

$$\text{So, cost price of article – E} = 100x \times 2 = \text{Rs. } 200x$$

Now,

$$\text{Selling price of article – A} = 100x \times \frac{112}{100} = \text{Rs. } 112x$$

$$\text{Selling price of article – E} = 200x \times \frac{108}{100} = \text{Rs. } 216x$$

$$\text{Marked price of article – E} = 200x \times \frac{120}{100} = \text{Rs. } 240x$$

$$\text{Required\%} = \frac{216x - 112x}{240x} \times 100$$

$$= \frac{104}{240} \times 100 = \frac{130}{3}\% = 43\frac{1}{3}\%$$

3. If discount allowed on article-B is halved, then find the change in profit percentage.

- (a) 10% (b) 20% (c) 15% (d) 25% (e) 5%

Sol. (c): Let cost price of article – B be Rs. 100x.

$$\text{Then, marked price of article – B} = 100x \times \frac{150}{100} = \text{Rs. } 150x$$

$$\text{And selling price of article – B} = 100x \times \frac{20}{100} = \text{Rs. } 120x$$

$$\text{So, discount allowed on article – B} = 150x - 120x = \text{Rs. } 30x$$

$$\text{Now selling price of article – B, when discount allowed is halved} = 120x + \frac{30x}{2} = \text{Rs. } 135x$$

$$\text{New profit\%} = \frac{135x - 100x}{100x} \times 100 = 35\%$$

$$\text{Required\%} = 35\% - 20\% = 15\%$$

4. If marked price of article-C is 60% more than that of article-B and difference between discount allowed on article-B & article-C is Rs.72, then find average of cost price of article-C & B.

- (a) Rs.600 (b) Rs.300 (c) Rs.500 (d) Rs.700 (e) Rs.400

Sol. (a): Let marked price of article – B be Rs. 100x.

$$\text{So, marked price of article – C} = 100x \times \frac{160}{100} = \text{Rs. } 160x$$

Now,

$$\text{Cost price of article – B} = 100x \times \frac{100}{150} = \text{Rs. } \frac{200x}{3}$$

$$\text{Cost price of article – C} = 160x \times \frac{100}{120} = \text{Rs. } \frac{400x}{3}$$

$$\text{Selling price of article – B} = \frac{200x}{3} \times \frac{120}{100} = \text{Rs. } 80x$$

$$\text{Selling price of article – C} = \frac{400x}{3} \times \frac{114}{100} = \text{Rs. } 152x$$

ATQ,

$$(100x - 80x) - (160x - 152x) = 72$$

$$12x = 72$$

$$x = 6$$

$$\text{Required average} = \frac{\frac{200x}{3} + \frac{400x}{3}}{2} = 100x = \text{Rs. } 600$$

5. If cost price of article-D is 25% of marked price of article-E, then find selling price of article-D is what percent of selling price of article-E?

- (a) 25% (b) 60% (c) 15% (d) 50% (e) 35%

5. (e): Let marked price of article – E be Rs. 100x.

$$\text{So, cost price of article – D} = \frac{25}{100} \times 100x = \text{Rs. } 25x$$

$$\text{Selling price of article – D} = 25x \times \frac{126}{100} = \text{Rs. } 31.5x$$

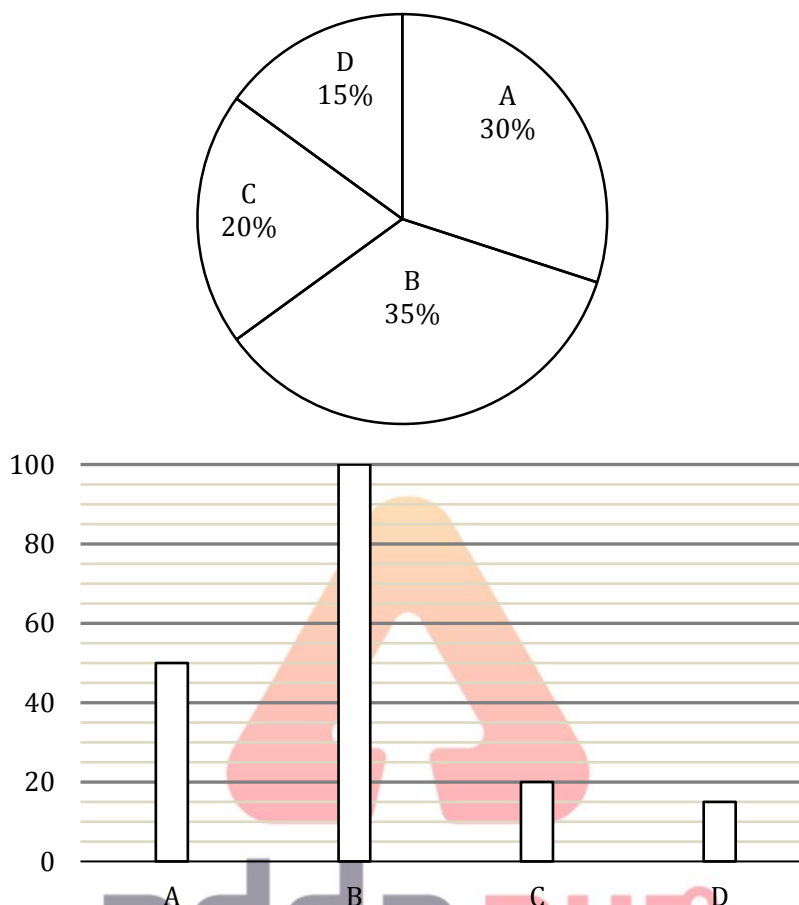
$$\text{Cost price of article – E} = 100x \times \frac{100}{120} = \text{Rs. } \frac{250x}{3}$$

$$\text{Selling price of article – E} = \frac{250x}{3} \times \frac{108}{100} = 90x$$

$$\text{Required\%} = \frac{31.5x}{90x} \times 100 = 35\%$$

Directions (6-10):- Given pie graph shows the percentage distribution of profit earned from sales of four (A, B, C & D) different items. while bar graph shows the total number of units sold of these four items. Read the data carefully and answer the following questions.

Total Profit earned = Rs 5000



6. If the cost price of one unit of item A is Rs 300, then find the selling price of one unit of item A.
 (a) Rs 330 (b) Rs 320 (c) Rs 303 (d) Rs 333 (e) Rs 300

Sol. (a): profit earned on each unit of item A = $\frac{30}{100} \times 5000 \times \frac{1}{50} = \text{Rs } 30$

Required selling price = $300 + 30 = 330 \text{ Rs.}$

7. If the cost price of one unit of item B to one unit of item C is in the ratio of 4 : 5 and the ratio of selling price of one item B to one item C is in the ratio of 1 : 2, then find the selling price of one unit of item B.

(a) Rs 39.5 (b) Rs 37.5 (c) Rs 38.5 (d) Rs 38 (e) Rs 39

Sol. (b): Profit earned on one unit of item B = $\frac{35}{100} \times 5000 \times \frac{1}{100} = \text{Rs } 17.5$

Profit earned on one unit of item C = $\frac{20}{100} \times 5000 \times \frac{1}{20} = \text{Rs } 50$

Let cost price of one-unit of item B and one-unit of item C is Rs 4x & Rs 5x respectively

$$\text{ATQ, } \frac{4x+17.5}{5x+50} = \frac{1}{2}$$

$$x=5$$

Selling price of one unit of item B = $4x+17.5 = \text{Rs } 37.5$

8. What is the ratio of profit earned on one unit of item A to one unit of item D?

(a) 3 : 5 (b) 4 : 7 (c) 10 : 3 (d) 1 : 1 (e) 5 : 3

Sol. (a): Required ratio = $\frac{30}{100} \times 5000 \times \frac{1}{50} : \frac{15}{100} \times 5000 \times \frac{1}{15}$
 $= 30 : 50 = 3 : 5$

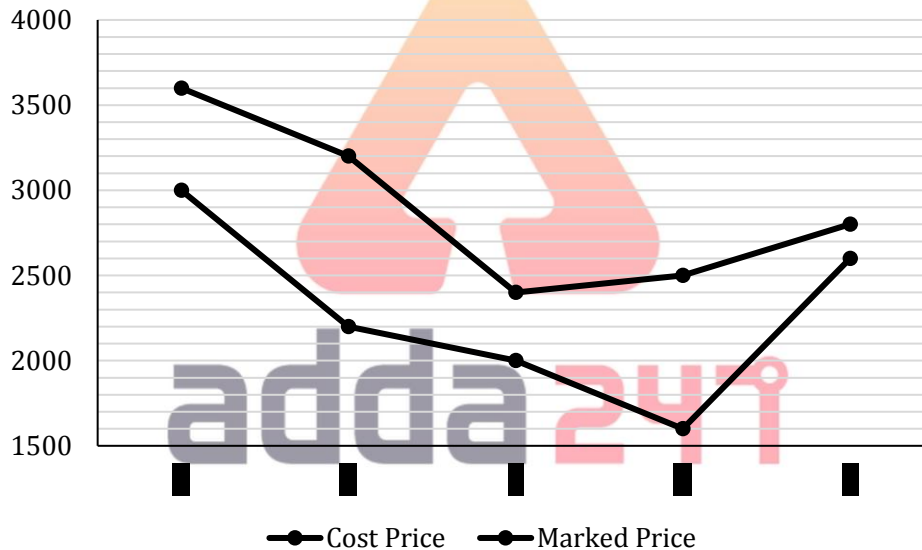
9. Profit earned on one unit of item B is what percent less than the profit earned on one unit of item A?
 (a) 50% (b) $45\frac{2}{3}\%$ (c) $47\frac{2}{3}\%$ (d) $43\frac{2}{3}\%$ (e) $41\frac{2}{3}\%$

Sol. (e): Profit earned on one unit of item B = $\frac{35}{100} \times 5000 \times \frac{1}{100} = \text{Rs } 17.5$
 Profit earned on one unit of item A = $\frac{30}{100} \times 5000 \times \frac{1}{50} = \text{Rs } 30$
 Required percentage = $\frac{30-17.5}{30} \times 100 = 41\frac{2}{3}\%$

10. Find the total profit earned on one unit of each of the given four items(in Rs.)?
 (a) 147.50 (b) 145.50 (c) 155 (d) 143.50 (e) 152.50

Sol. (a): Profit earned on one unit of item A = $\frac{30}{100} \times 5000 \times \frac{1}{50} = \text{Rs } 30$
 Profit earned on one unit of item B = $\frac{35}{100} \times 5000 \times \frac{1}{100} = \text{Rs } 17.5$
 Profit earned on one unit of item C = $\frac{20}{100} \times 5000 \times \frac{1}{20} = \text{Rs } 50$
 Profit earned on one unit of item D = $\frac{15}{100} \times 5000 \times \frac{1}{15} = \text{Rs } 50$
 Required sum = $30 + 17.5 + 50 + 50 = 147.5 \text{ Rs.}$

Direction (11-15): The line graph given below shows the cost price (in Rs.) and marked price (in Rs.) of 5 different articles A, B, C, D and E. Read the data carefully and answer the questions given below.



11. If the discount on article B is 20% and Profit on article D is 40%, then find the difference between selling prices of articles B and that of article D (in Rs.)?
 (a) 300 (b) 320 (c) 360 (d) 380 (e) 400

Sol. (b): Selling price of article B = $3200 \times \frac{80}{100} = 2560 \text{ Rs.}$
 Selling price of article D = $1600 \times \frac{140}{100} = 2240 \text{ Rs.}$
 Required difference = $2560 - 2240 = 320 \text{ Rs.}$

12. Cost prices of article C and article D together is what percent of marked price of article A and article E together?
 (a) 60.25% (b) 62.25% (c) 56.25% (d) 52.25% (e) 70.25%

Sol. (c): Cost price of article C and D together = $(2000 + 1600) = 3600 \text{ Rs.}$
 Marked price of article A and E together = $(3600 + 2800) = 6400 \text{ Rs.}$
 Required % = $\frac{3600}{6400} \times 100 = 56.25\%$

13. If the Profit gained on article C is 20%, then find the percent discount given on article C?
 (a) 10% (b) 5% (c) 3% (d) 4% (e) None of these

Sol. (e): Selling price of article C = $2000 \times \frac{120}{100} = 2400$ Rs.

So, percentage discount = $\frac{2400 - 2400}{2400} \times 100 = 0\%$

14. Find out the average marked-price of articles C, D, E and A together?

- (a) 2825 Rs. (b) 2900 Rs. (c) 3000 Rs. (d) 2625 Rs. (e) 2800 Rs.

Sol. (a): Average marked price of C, D, E and A = $\frac{2400 + 2500 + 2800 + 3600}{4} = \text{Rs. } 2825$

15. Find the ratio between the total cost price of articles A, C and D together to the total marked price of articles B and E together?

- (a) 10:11 (b) 11:10 (c) 5:6 (d) 4:7 (e) 10:13

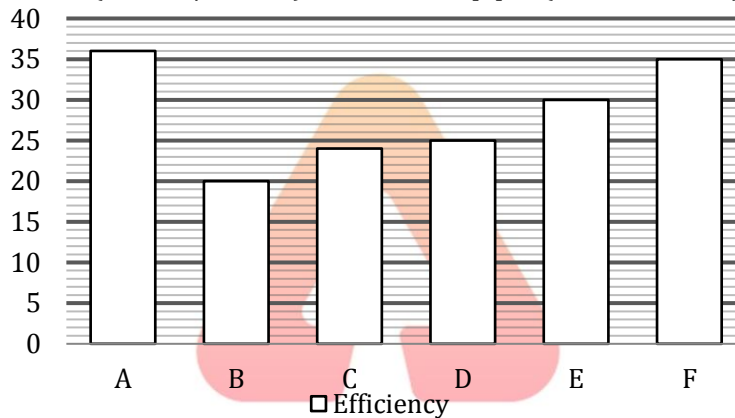
Sol. (b): Cost price of article A, C, and D together = $(3000 + 2000 + 1600) = 6600$ Rs.

Marked price of article B and E together = $(3200 + 2800) = 6000$ Rs.

Required ratio = $\frac{6600}{6000} = 11:10$

Directions (16-20): Study the bar chart given below and answer the following questions.

The bar chart shows the efficiencies (in liters/minute) of 6 different pipes (A, B, C, D, E & F).



16. Pipe - D & E together can fill a tank in 36 minutes. Pipe - C alone starts filling the same tank and after **T** minutes, pipe - D & E together replaced it. If pipe - D & E together filled the remaining tank in 24 minutes, then find **T**.

- (a) 27.5 (b) 25 (c) 30 (d) 32.5 (e) 22.5

Sol. (a): Total capacity of tank = $(25 + 30) \times 36 = 1980$ liters

Tank filled by pipe - D & E together in 24 minutes = $1980 \times \frac{24}{36}$
= 1320 liters

Tank filled by pipe - C alone = $1980 - 1320 = 660$ liters

Hence, $T = \frac{660}{25} = 26.4$

17. Pipe - A, C & F starts filling a tank in such a way that pipe - A filled the tank in 1st and 2nd minute, then pipe - F filled the tank in 3rd minute and then pipe - C filled the tank in 4th & 5th minute. If the tank is completely filled in $82\frac{5}{7}$ minutes, then find the total capacity of the tank.

- (a) 2553 liters (b) 2560 liters (c) 2592 liters (d) 2577 liters (e) None of the above.

Sol. (d): Tank filled by pipe - A in 1st & 2nd minute = 36×2
= 72 liters

Tank filled by pipe - F in 3rd minute = 35 liters

Tank filled by pipe - C in 4th & 5th minute = $25 \times 2 = 50$ liters

Total tank filled in 5 minutes = $72 + 35 + 50 = 157$ liters

Tank filled in 80 minutes = $157 \times \frac{80}{5} = 2512$ liters

Total capacity of tank = $2512 + 36 \times 2 + 35 \times \frac{5}{7}$

= $2512 + 72 + 25 = 2609$ liters

18. If pipe – D alone can fill a tank in 84 minutes and pipe – G is 40% more efficient than pipe – B, then find the time taken by pipe – F & G together to fill the same tank.

- (a) 80 minutes (b) 72 minutes (c) $33\frac{1}{3}$ minutes (d) 60 minutes (e) $66\frac{2}{3}$ minutes

Sol. (c): Total capacity of tank = $84 \times 25 = 2,100$ liters

$$\text{Efficiency of pipe – G} = \frac{140}{100} \times 20$$

$$= 28 \text{ liters/minute}$$

$$\text{Required time} = \frac{2,100}{35+28}$$

$$= 33\frac{1}{3} \text{ minutes}$$

19. If the total capacity of a tank is 3200 liters and pipes – B, D & E are attached to it. Pipe – B & E are filling pipes and pipe – D is an emptying pipe. If all three pipes are opened together in the tank, then in how much time the tank will be completely filled?

- (a) 120 minutes (b) 128 minutes (c) 112 minutes (d) 136 minutes (e) 148 minutes

Sol. (b): Total tank filled by pipes – B, D & E together in 1 minute = $20 + 30 - 25 = 25$ liters

$$\text{Required time} = \frac{3200}{25}$$

$$= 128 \text{ minutes}$$

20. If pipes – A, C & P together can fill the tank in 24 minutes and efficiency of pipe – P is 60% more than the efficiency of pipe – D, then find the total capacity of the tank?

- (a) 2000 liters (b) 2400 liters (c) 1800 liters (d) 2500 liters (e) 3000 liters

Sol. (b): Efficiency of pipe – P = $\frac{160}{100} \times 25$

$$= 40 \text{ liters/minute}$$

$$\text{Required capacity of tank} = 24 \times (36 + 24 + 40)$$

$$= 2400 \text{ liters}$$

Directions (21-25): The following table shows different vessels, type of their shapes and different dimensions of these vessels.

(Note: Some values are missing, you need to calculate those values if required.)

Vessels	Type of Shape	Dimension (in cm.)			
		Length	Breadth	Height	Radius
A	Cube	35	-	-	-
B	Cuboid	-	-	25	-
C	Cone	-	-	28	-
D	Cylinder	-	-	20	-
E	Hemisphere	-	-	-	21

21. Vessel E is filled with water and then the water is poured from vessel E to vessel D. If the radius of the vessel D is same as the height of vessel C, then what is the height of water in vessel D?

- (a) $7\frac{3}{8}$ cm (b) $7\frac{1}{8}$ cm (c) $7\frac{5}{8}$ cm (d) $7\frac{7}{8}$ cm (e) $7\frac{3}{4}$ cm

Sol. (d): Let the height of water in vessel D be h cm.

$$\text{Volume of vessel E} = \text{Volume of water in vessel D}$$

$$\Rightarrow \frac{2}{3} \times \pi \times 21^3 = \pi \times 28^2 \times h$$

$$\Rightarrow h = \frac{63}{8} = 7\frac{7}{8} \text{ cm}$$

22. If the area of the bottom of vessel B is 1260cm^2 , then the capacity of vessel A is how much percent more than that of vessel B?

- (a) $33\frac{1}{3}\%$ (b) $36\frac{1}{9}\%$ (c) $35\frac{5}{7}\%$ (d) $36\frac{4}{11}\%$ (e) $30\frac{10}{13}\%$

Sol. (b): Capacity of vessel A = (length)³ = 35³ = 42875 cm²

Capacity of vessel B = Area of bottom × height = 1260 × 25 = 31500 cm²

$$\begin{aligned}\text{Required Percentage} &= \frac{42875 - 31500}{31500} \times 100 \\ &= 36\frac{1}{9}\%\end{aligned}$$

23. What the ratio of lateral surface areas of vessel C and vessel E if the ratio of radius and height of vessel C is 3 : 4?

(a) 5 : 6

(b) 6 : 5

(c) 3 : 5

(d) 5 : 3

(e) 2 : 3

Sol. (a): $\frac{\text{Radius of vessel C}}{\text{Height of vessel C}} = \frac{3}{4}$

$$\Rightarrow \frac{\text{Radius}}{28} = \frac{3}{4}$$

Radius of vessel C = 21 cm

Slant height of vessel C = $\sqrt{\text{Radius}^2 + \text{Height}^2}$

$$= \sqrt{21^2 + 28^2} = 35 \text{ cm}$$

Ratio of lateral surface areas of vessel C and vessel E:

$$\begin{aligned}&\frac{\text{Lateral Surface Area of vessel C}}{\text{Lateral Surface Area of vessel E}} \\ &= \frac{\pi \times \text{Radius} \times \text{Slant Height}}{2 \times \pi \times \text{Radius}^2} \\ &= \frac{\pi \times 21 \times 35}{2 \times \pi \times 21^2} = \frac{5}{6} = 5 : 6\end{aligned}$$

24. Capacity of another cylindrical vessel F is 10% more than that of vessel A. If the height of vessel F is 49, then radius of vessel F is how much percent less than that of vessel E?

(a) 18 $\frac{2}{11}$ %

(b) 22 $\frac{2}{9}$ %

(c) 16 $\frac{2}{3}$ %

(d) 14 $\frac{2}{7}$ %

(e) 14 $\frac{3}{7}$ %

Sol. (c): Let the radius of vessel F be r cm

Capacity of cylindrical vessel F = 10% more than capacity of vessel A

$$\frac{22}{7} \times r^2 \times 49 = 1.1 \times 35 \times 35 \times 35$$

$$\Rightarrow r = 17.5 \text{ cm}$$

$$\text{Required Percentage} = \frac{21 - 17.5}{21} \times 100 = 16\frac{2}{3}\%$$

25. Vessel D needs to be painted on the lateral surface while vessel A needs to be painted on lateral surface as well as on the bottom. What will be the total expenditure of painting these vessels if the cost of painting is Rs. 0.2/cm² if the radius of the vessel D is same as the height of vessel C?

(a) Rs.1919

(b) Rs.1939

(c) Rs.1909

(d) Rs.1929

(e) Rs. 2019

Sol. (d): Total Area to be painted

= Lateral Surface Area of vessel D + (Lateral Surface Area + Area of the bottom) of vessel A

$$= 2 \times \frac{22}{7} \times 28 \times 20 + 5 \times 35 \times 35$$

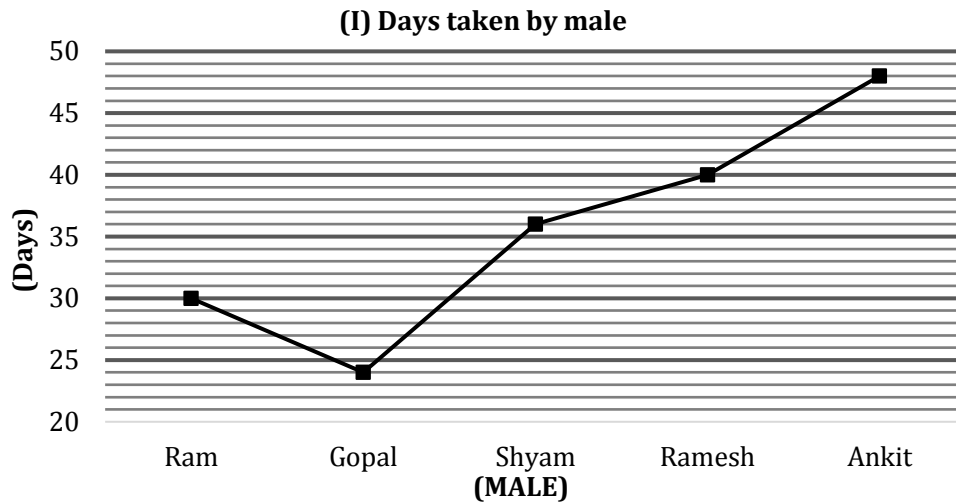
$$= 3520 + 6125 = 9645 \text{ cm}^2$$

Total Expenditure = 0.2 × 9645

$$= \text{Rs.1929}$$

Directions (26-30): Below line graph shows days taken by five males in complete a same work individually. Table shows ratio of efficiency of couples in complete same work individually. Give the answer according to given data:

Note: all couple starts work together



(II) Ratio of efficiency of couples

Name (male : female)	Ratio (male : female)
Ram : Seema	4 : 3
Gopal : Surbhi	4 : 1
Shyam : Ekta	2 : 1
Ramesh : Priya	3 : 2
Ankit : Shushmita	3 : 2

26. Two couples Ram & Seema and Shyam & Ekta starts work together, but after X days Shyam & Ekta left the work and Ramesh & Priya joined to Ram & Seema and they complete remaining work in (X + 4) days and ratio of work done by Rams & Seema and Shyam & Ekta together to work done by Ram & Seema and Ramesh & Priya together is 3 : 7. Then find the value of X ?

- (a) 5 days (b) 4 days (c) 3 days (d) 2 days (e) 6 days

Sol. (c): Let total work = 720w

$$\text{Ram efficiency} = \frac{720}{30} = 24 \text{ w/d}$$

$$\text{Ram : Seema efficiency} = 4 : 3$$

$$\text{Seema efficiency} = \frac{24}{4} \times 3 = 18 \text{ w/d}$$

$$\text{Shyam \& Ekta efficiency}$$

$$= \frac{720}{36} \& \frac{720}{36} \times \frac{1}{2}$$

$$= 20 \& 10 \text{ w/d}$$

$$\text{Ramesh and Priya efficiency}$$

$$= \frac{720}{40} \& \frac{720}{40} \times \frac{2}{3}$$

$$= 18 \& 12 \text{ w/d}$$

According to question —

$$\frac{(42+30)X}{(42+30)(X+4)} = \frac{3}{7}$$

$$504X = 216X + 864$$

$$288X = 864$$

$$X = 3 \text{ days}$$

27. Gopal & Surbhi started and working for X days, after that Ankit & Shushmita also joined Gopal & Surbhi and both couple work for next Y day. After Y days both couples left the work and remaining work completed by Shyam & Ekta in $2\frac{1}{3}$ days. If value of Y is 200% of value of X, then find the value of (X + Y)?

- (a) 12 days (b) 10 days (c) 8 days (d) 6 days (e) 15 days

Sol. (a): Let total work = 720w

Efficiency of Gopal & Surbhi

$$= \frac{720}{24} \& \frac{720}{24} \times \frac{1}{4}$$

$$= 30 \& 7.5 \text{ w/d}$$

Efficiency of Ankit & Shushmita

$$= \frac{720}{48} \& \frac{720}{48} \times \frac{2}{3}$$

$$= 15 \& 10 \text{ w/d}$$

Shyams & Ekta efficiency = 20 & 10 w/d

According to question

$$Y = \frac{200}{100} X$$

$$= Y = 2X$$

$$37.5X + (37.5 + 25)(2X) + (20 + 10)\frac{7}{3} = 720$$

$$37.5X + 125X + 70 = 720$$

$$162.5X = 720 - 70$$

$$X = \frac{650}{162.5} = 4$$

$$(X + Y) = (4 + 2 \times 4) = (4 + 8) = 12 \text{ days}$$

28. Ram & Seema starts working and after 5 day of work, Seema left the work because of her Uncle health and Ram work for next 8 days alone and he also left the work after that Shyam and Ekta joined and complete the remaining work. If total wage of work is 18720 Rs. then find individually wage of both couples according to portion of work done by both couple?

- (a) 1025 Rs., 8468 Rs. (b) 9452 Rs. 448 Rs. (c) 10452 Rs., 8268 Rs.
(d) 10252 Rs, 8468 Rs. (e) None of these

Sol. (c): Let total work = 720w

Efficiency of Ram & Seema = 24 & 18 w/d

Efficiency of Shyam & Ekta = 20 & 10 w/d

According to question —

Work done by Ram & Seema

$$(24 + 18) \times 5 + 8 \times 24 = 402$$

$$\text{Remaining work done by Shyam & Ekta} = 720 - 402 = 318$$

Share of wage

Ram & Seema share

$$= 18720 \times \frac{402}{720}$$

$$= 10452 \text{ Rs.}$$

Shyam & Ekta share

$$= 18720 \times \frac{318}{720} = 8268 \text{ Rs.}$$

29. Gopal and Surbhi started work, if Gopal work half of his efficiency and Surbhi at 200% of her efficiency and work for 6 days. After 6-day Ankit & Shushmita replace Gopal & Surbhi and work for next 15 days. If Ankit work 20% more efficiently and after 15 days Ankit & Shushmita left the work then find what fraction of work remain uncomplete?

- (a) $\frac{1}{6}$ (b) $\frac{1}{4}$ (c) $\frac{1}{5}$ (d) $\frac{1}{3}$ (e) $\frac{1}{7}$

Sol. (a): Let total work = 720w

Gopal and Surbhi new efficiency

$$= \frac{720}{24} \times \frac{1}{2} + \frac{720}{24} \times \frac{1}{4} \times \frac{200}{100}$$

$$= 15 + 15 = 30 \text{ w/d}$$

Ankit new efficiency

$$= \frac{720}{48} \times \frac{120}{100} = 18 \text{ w/d}$$

According to question —

Remain work

$$= 720 - \frac{30 \times 6 + (18 + 10) \times 15}{720}$$

$$= \frac{720 - 600}{720} = \frac{120}{720}$$

$$= \frac{1}{6} \text{ work}$$

30. Shyam & Ekta work for 6 days and replace by Ramesh & Priya, who work for next 10 day and left the job. If an another couple Umesh & Kavita completed remaining work in 12 days then find the ratio of efficiency of Umesh and Kavita to Shyam & Ekta?

(a) 5 : 7

(b) 5 : 4

(c) 5 : 3

(d) 2 : 3

(e) 5 : 8

Sol. (d): According to question —

Umesh & Kavita complete whole work in

$$= \frac{6}{\frac{720}{30}} + \frac{10}{\frac{720}{30}} + 12 \text{ (Umesh & Kavita)} = 1$$

$$= \frac{6}{24} + \frac{10}{24} + 12 \text{ (Umesh & Kavita)} = 1$$

$$= 12 \text{ (Umesh & Kavita)} = 1 - \frac{16}{24}$$

$$= \text{Umesh & Kavita} = \frac{1}{3 \times 12} = \frac{1}{36} \text{ days}$$

Efficiency of Umesh & Kavita

$$= \frac{720}{36} = 20 \text{ w/d}$$

Shyam & Ekta efficiency

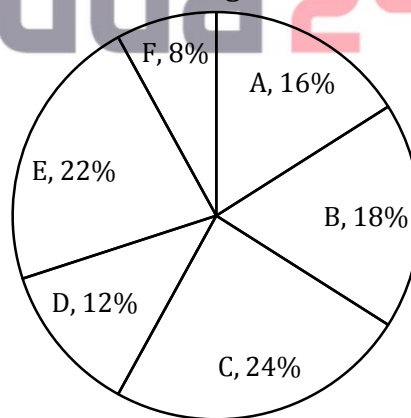
$$= \frac{720}{36} + \frac{720}{36} \times \frac{1}{2}$$

$$= 20 + 10 = 30 \text{ w/d}$$

$$\text{Required ratio} = \frac{20}{30} = 2 : 3$$

Directions (31-35): Pie chart given below shows length of six different trains and table given below shows ratio between speed of six trains on three different days. Study the data carefully and answer the following questions.

Total length = 1600m



Train	Speed on Monday	:	Speed on Tuesday	:	Speed on Wednesday
A	2	:	3	:	2
B	3	:	4	:	5
C	4	:	6	:	5
D	4	:	4	:	7
E	6	:	9	:	5
F	4	:	5	:	3

31. On Wednesday, train 'B' crosses train 'D' coming from opposite direction in 6 seconds. If speed of train 'B' on Monday is 97.2 km/hour then in how much time train 'F' can cross train 'D' on Monday if train 'D' is coming from opposite direction and speed of train 'F' on Monday is 20 m/sec.

(a) 6 seconds (b) 8 seconds (c) 10 seconds (d) 12 seconds (e) 14 seconds

Sol. (b): Length of train B = $\frac{18}{100} \times 1600 = 288\text{m}$

$$\text{Length of Train D} = \frac{12}{100} \times 1600 = 192\text{m}$$

$$\text{Length of Train F} = \frac{8}{100} \times 1600 = 128\text{m}$$

$$\text{Speed of train B on Monday} = 97.2 \times \frac{5}{18} = 27 \text{ m/sec}$$

$$\text{Speed of train 'B' on Wednesday} = \frac{27}{3} \times 5 = 45 \text{ m/sec}$$

ATQ,

$$288 + 192 = (45 + y) \times 6$$

where y is the speed of train 'D' on Wednesday

$$\Rightarrow y = 80 - 45 = 35 \text{ m/sec}$$

$$\text{Speed of train 'D' on Monday} = \frac{35}{7} \times 4 = 20 \text{ m/sec}$$

$$\text{Time required to cross train F} = \frac{192+128}{20+20} = 8 \text{ seconds}$$

32. Train 'C' start from Delhi on Monday at 7:00 p.m and reach Kanpur on next day at 3:00 pm. In return journey on Tuesday, train 'C' start from Kanpur at 6 : 00 pm and reach Jaipur which is 180 km ahead of Delhi at 5 : 48 pm on Wednesday. Find the time taken by train 'C' to cross a pole on Monday?

(a) 8 seconds (b) 16 seconds (c) 19.2 seconds (d) 14.4 seconds (e) 28.8 seconds

Sol. (e): Let speed of train 'C' on Monday, Tuesday and Wednesday be 4x, 6x and 5x respectively.

Train 'C' travel 5 hours on Monday and 15 hours on Tuesday.

$$\therefore \text{Total distance} = 5 \times 4x + 15 \times 6x$$

$$= 110x$$

On the same day i.e, Tuesday, train 'C' start from Kanpur. It travels 6 hours on Tuesday and 17.8 hours on Wednesday.

$$\therefore \text{total distance travel} = 6 \times 6x + 17.8 \times 5x$$

$$= 36x + 89x$$

$$= 125x$$

$$\text{ATQ, } 125x = 110x + 180$$

$$\Rightarrow 15x = 180$$

$$\Rightarrow x = 12$$

speed of train 'C' on Monday

$$= 12 \times 4 = 48 \text{ km/hour} = \frac{40}{3} \text{ m/sec}$$

$$\text{Length of train 'C'} = \frac{24}{100} \times 1600 = 384$$

$$\text{Required time} = \frac{384}{40} \times 3 = 28.8 \text{ sec}$$

33. On Monday, train 'A' takes 2.5 hours more to cover 900 km distance than train 'C'. If train 'A' can cross a platform of length 128 in 12.8 seconds on Tuesday then find in how much time (in seconds) train 'C' can cross two poles 66 m apart from each other on Tuesday?

(a) 12 seconds (b) 16 seconds (c) 20 seconds (d) 24 seconds (e) 30 seconds

Sol. (a): Let, speed of train 'A' and train 'C' on Monday be '4x' and '4y' respectively

ATQ,

$$2.5 = \frac{900}{4x} - \frac{900}{4y}$$

$$2.5 = 225 \left[\frac{1}{x} - \frac{1}{y} \right]$$

$$xy = 90 (y - x)$$

$$\text{length of train 'A'} = \frac{16}{100} \times 1600 = 256$$

$$\text{speed of train 'A' on Tuesday} = \frac{256+128}{12.8} = \frac{384}{12.8}$$

$$= 30 \text{ m/sec}$$

$$\Rightarrow \text{Speed of train 'A' on Monday} = \frac{30}{3} \times 2 = 20 \text{ m/sec} = 72 \text{ km/hr}$$

$$\Rightarrow 4x = 72$$

$$\Rightarrow x = 18$$

$$xy = 90(y - x)$$

$$y = 5(y - 18)$$

$$\Rightarrow y = 22.5$$

$$\text{Speed of train 'C' on Monday} = 4y$$

$$= 4 \times 22.5 = 90 \text{ km/hr}$$

$$\text{Speed of train 'C' on Tuesday} = \frac{90}{4} \times 6$$

$$= 135 \text{ km/hr} = 37.5 \text{ m/sec}$$

$$\text{Length of train 'C'} = \frac{24}{100} \times 1600 = 384$$

$$\text{Required time} = \frac{384+66}{37.5} = 12 \text{ seconds}$$

34. Ratio between speed of train 'E' to train 'F' on Monday is 3 : 2. On Tuesday train 'E' cross train 'F' running in same direction in 24 seconds then find the time in which train 'E' can overtakes train 'F' on Wednesday?

- (a) 48 seconds (b) 24 seconds (c) 12 seconds (d) 36 seconds (e) 60 seconds

Sol. (a): Length of train 'E' = $\frac{22}{100} \times 1600 = 352$

$$\text{Length of train 'F'} = \frac{8}{100} \times 1600 = 128$$

Let speed of train 'E' and train 'F' on Monday be $6x$ and $4y$ respectively.

$$\Rightarrow \frac{6x}{4y} = \frac{3}{2} \Rightarrow \frac{x}{y} = \frac{1}{1}$$

Let speed of train 'E' on Tuesday = $9x$

So speed of train 'F' on Tuesday = $5y = 5x$

ATQ,

$$9x - 5x = \frac{352+128}{24} = 20$$

$$\Rightarrow 4x = 20$$

$$\Rightarrow x = 5$$

Speed of train 'E' on Wednesday = $5 \times 5 = 25 \text{ m/sec}$

Speed of train 'F' on Wednesday = $3 \times 5 = 15 \text{ m/sec}$

$$\text{Required time} = \frac{352+128}{25-15} = \frac{480}{10} = 48 \text{ seconds}$$

35. Ratio between time taken by train 'B' to train 'D' to cross a pole on Monday is 1 : 1. The time taken by train 'B' to cross a pole on Wednesday is what percent more/less than time taken by train 'D' to cross a pole on Monday?

- (a) 30% (b) 40% (c) 50% (d) 60% (e) 70%

Sol. (b): Let, speed of train 'B' on Monday, Tuesday & Wednesday be $3x$, $4x$ & $5x$ respectively.

And speed of train 'D' on Monday, Tuesday & Wednesday be $4y$, $4y$ & $7y$ respectively.

$$\text{Length of train 'B'} = \frac{18}{100} \times 1600 = 288$$

$$\text{Length of train 'D'} = \frac{12}{100} \times 1600 = 192$$

ATQ,

$$\frac{\frac{288}{3x}}{\frac{192}{4y}} = \frac{1}{1} \Rightarrow \frac{3}{2} \times \frac{4y}{3x} = \frac{1}{1}$$

$$\Rightarrow \frac{y}{x} = \frac{1}{2} \Rightarrow x = 2y$$

$$\text{Time taken by train 'B' on Wednesday to cross pole} = \frac{288}{5x} = \frac{57.6}{x}$$

$$\text{Time taken by train 'D' on Monday to cross a pole} = \frac{192}{4y} = \frac{96}{x}$$

$$\text{Required \%} = \frac{\left(\frac{96}{x} - \frac{57.6}{x}\right) \times 100}{\frac{96}{x}} = \frac{38.4}{96} \times 100 = 40\%$$

Direction (36-40): Table given below shows profit percentage earned on selling two different items X and Y and discount percentage offered by five retailers on these items. Mark price of each article sold by each retailer is same while cost price of article for each retailer may vary. Study the data carefully & answer the following question

Items→	X		Y	
Retailor ↓	Profit %	Discount %	Profit %	Discount %
A	20%	–	–	15%
B	–	26.5%	20%	32.5%
C	25%	–	60%	24%
D	20%	34%	–	37%
E	35%	46%	–	28%

36. On article 'X', 28% discount is offered by 'A'. If selling price of article 'Y' sold by 'A' is Rs 312 more than selling price of article 'X' sold by 'A' then find profit percent earned by 'A' on selling article 'Y' given that average of cost price of both article for 'A' is Rs 1520.

- (a) 18.5% (b) 22.5% (c) 27.5% (d) 32.5% (e) 37.5%

Sol. (c): Let, marked price of both articles be $600x$

$$\text{S.P. of article X} = 600x \times \frac{72}{100} = 432x$$

$$\text{S.P. of article Y} = 600x \times \frac{85}{100} = 510x$$

ATQ,

$$510x - 432x = 312$$

$$\Rightarrow 78x = 312$$

$$\Rightarrow x = 4$$

$$\text{Cost price of article 'X'} = \frac{432 \times 4}{120} \times 100 = 1440$$

$$\text{Cost price of article 'Y'} = 1520 \times 2 - 1440 = 3040 - 1440 = 1600$$

$$\text{Profit \% earned on selling article Y} = \frac{510 \times 4 - 1600}{1600} \times 100$$

$$= \frac{440}{1600} \times 100 = 27.5\%$$

37. Discount % on article 'X' offered by 'C' is 15% while profit % of article 'Y' sold by 'E' is $33\frac{1}{3}\%$. If difference between cost price of article 'Y' sold by 'B' and 'E' together is Rs 216 more than cost price of article 'X' sold by 'C' and 'E' together then find the cost price of article 'Y' sold by 'C'?

- (a) Rs. 4940 (b) Rs. 3420 (c) Rs. 3800 (d) Rs. 4180 (e) Rs. 4560

Sol. (e): Let M.P. of each article sold by each seller be $800x$

$$\text{Cost price of article Y sold by B} = \frac{800x \times 67.5}{120} = 450x$$

$$\text{Cost price of article Y sold by E} = \frac{800x \times 72}{4 \times 100} \times 3 = 432x$$

$$\text{Cost price of article X sold by C} = \frac{800x \times 85}{125} = 544x$$

$$\text{Cost price of article X sold by E} = \frac{800x \times 54}{135} = 320x$$

ATQ,

$$(450x + 432x) - 544x - 320x = 216$$

$$882x - 864x = 216$$

$$\Rightarrow x = \frac{216}{18} = 12$$

$$\text{M.P. of each article} = 800 \times 12 = 9600$$

$$\text{Cost price of article Y sold by C} = \frac{9600 \times 76}{160} = \text{Rs } 4560$$

38. Find the ratio between cost price of article 'X' for 'B' to cost price of article 'Y' for 'D'. If profit % of article 'X' sold by 'B' and profit % of article 'Y' sold by 'D' is 68% and 20% respectively.

- (a) 2 : 3 (b) 5 : 6 (c) 1 : 2 (d) 5 : 8 (e) 5 : 7

Sol. (b): Let M.P. of each article be $400x$

$$\text{Cost price of article X sold by B} = \frac{400x \times 73.5}{168} = 175x$$

$$\text{Cost price of article Y sold by D} = \frac{400x \times 63}{120} = 210x$$

$$\text{Required ratio} = \frac{175x}{210x} = \frac{5}{6}$$

39. Selling price of article 'X' sold by 'E' is same as cost price of article 'Y' for 'E'. Find the profit % earned by 'E' on selling article 'Y'?

- (a) 15% (b) $16\frac{2}{3}\%$ (c) 25% (d) $33\frac{1}{3}\%$ (e) $41\frac{2}{3}\%$

Sol. (d): Let M.P. of each article = $400x$

$$\text{S.P. of article X sold by E} = \frac{400x \times 54}{100} = 216x$$

$$\text{Cost price of article Y sold by E} = 216x$$

$$\text{Selling price of article Y sold by E} = \frac{400x \times 72}{100} = 288x$$

$$\text{Profit \%} = \frac{288x - 216x}{216x} \times 100 = \frac{72x}{216x} \times 100 = 33\frac{1}{3}\%$$

40. Seller A marked article 'X' 100% above its cost price. If on selling both article he earns total 25% profit, then find selling price of article 'X' sold by 'A' is what percent less than cost price of article 'Y' for 'A'.

- (a) 10% (b) $9\frac{1}{11}\%$ (c) $8\frac{1}{3}\%$ (d) 20% (e) 15%

Sol. (b): Let, M.P. of each article be $400x$

$$\text{C.P. of article X sold by A} = \frac{400x}{2} = 200x$$

$$\text{S.P. of article X sold by A} = 200x \times \frac{120}{100} = 240x$$

$$\text{SP of article Y sold of A} = 400x \times \frac{85}{100} = 340x$$

$$\text{Let, CP of article Y sold by A} = y$$

ATQ,

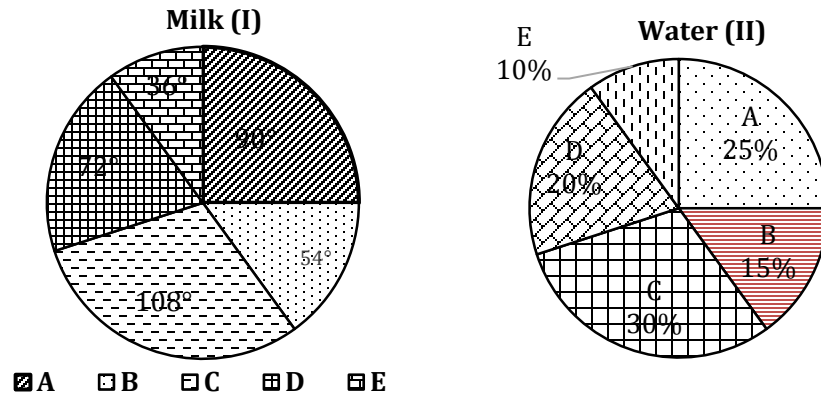
$$(200x + y) \times \frac{125}{100} = 240x + 340x$$

$$(200x + y) = \frac{580x}{5} \times 4$$

$$\Rightarrow y = 264x$$

$$\text{Required \%} = \frac{264x - 240x}{264x} \times 100 = 9\frac{1}{11}\%$$

Directions (41-45): Given below are two pie charts. Ist pie chart shows the degree distribution of the milk in five vessels out of the total milk in these vessels. Pie chart II shows the percentage distribution of water in five vessels out of total quantity of water in five vessels.



Note : Ratio of total milk to total water in these five containers are 4 : 1.

41. If the total quantity of water and milk in vessel A is 125 L, then total mixture of milk and water in vessel B is how much percentage more or less than total mixture of milk and water in vessel E ?

- (a) 37.5% (b) 45% (c) 55% (d) 50% (e) 65%

Sol. (d): Quantity of milk and water in vessel A

$$= \frac{\frac{90^\circ}{3.6}}{100} \times 4X + \frac{25}{100} \times X = \frac{4X}{4} + \frac{X}{4} = \frac{5X}{4} = 1.25X$$

$$1.25X = 125$$

$$X = 100$$

Milk and water in vessel B

$$= \frac{\frac{54^\circ}{3.6}}{100} \times 400 + \frac{15}{100} \times 100$$

$$= 60 + 15 = 75 \text{ L}$$

Milk and water in vessel E

$$= \frac{\frac{36^\circ}{3.6}}{100} \times 400 + \frac{10}{100} \times 100$$

$$= 40 + 10 = 50$$

$$\% \text{ required} = \frac{75-50}{50} \times 100$$

$$= \frac{25}{50} \times 100 = 50\% \text{ more}$$

42. Mixture of vessel A, B and C poured into a bigger vessel. Given quantity of milk in bigger vessel is 518 ℓ then find the difference of total mixture of bigger vessel and total mixture of vessel D and E together?

- (a) 270 ℓ (b) 350 ℓ (c) 370 ℓ (d) 380 ℓ (e) 360 ℓ

Sol. (c): Given, Quantity of all vessel some milk and water in bigger vessel =

Milk in (A + B + C) 4X + Water in (A + B + C) X

$$= \frac{\frac{90^\circ + 54^\circ + 108^\circ}{3.6}}{100} 4X + \frac{(25+15+30)}{100} X$$

$$= \frac{70}{100} 4X + \frac{70}{100} X = 2.8X + 0.7X$$

$$2.8X = 518\ell$$

$$X = 185$$

Total mixture in (A + B + C)

$$= 185 \times 3.5$$

$$= 647.5$$

Milk and water in vessel (D + E)

$$= \frac{\frac{72^\circ + 36^\circ}{3.6}}{100} 4X + \frac{(20+10)}{100} X$$

$$= 1.2X + 0.3X$$

$$= 1.5X = 1.5 \times 185 = 277.5$$

$$\text{Difference} = 647.5 - 277.5 = 370 \ell$$

43. Mixture of vessel C and D poured into an another vessel F. 165 ℓ of mixture taken out from the vessel F and 29 ℓ water added in the vessel, now ratio of milk to water is 8 : 3. Find the quantity of milk in vessel B ?

- (a) 48.6 ℓ (b) 109.2 ℓ (c) 87.5 ℓ (d) 53.6 ℓ (e) 55.6 ℓ

Sol. (b): Milk in vessel C and D is

$$= \frac{\frac{108^\circ + 72^\circ}{3.6}}{100} 4X = \frac{50}{100} 4X = 2X$$

Water in vessel C and D is

$$= \frac{30+20}{100} X = 0.5 X$$

(Milk : Water) in vessel F

$$= 2X : .5X = 4 : 1$$

According to question —

$$= \frac{4a - \frac{4}{5} \times 165}{a - \frac{1}{5} \times 165 + 29} = \frac{8}{3} = \frac{4a - 132}{a - 4} = \frac{8}{3}$$

$$= (12a - 8a) = 396 - 32$$

$$4a = 364$$

$$a = 91$$

$$\text{now, } X = 2a$$

$$X = 182$$

$$\text{Milk in vessel B} = \frac{54}{360} \times 182 \times 4 = 109.2 \ell$$

44. If total quantity of milk is 900 ℓ and a milk man charged 14 Rs. 15 Rs. and 16 Rs. per liter mixture vessel A, B and C respectively then find his profit if his profit per cent on selling all three mixtures is 25% ?

- (a) 2373.75 Rs. (b) 2275.75 Rs. (c) 2569.75 Rs. (d) 2169.75 Rs. (e) 2159.75 Rs.

Sol. (a): Total = 900 ℓ

Milk in vessel A

$$= 900 \times \frac{\frac{90^\circ}{3.6}}{100}$$

$$= 225 \ell$$

Water in vessel A

$$= \frac{225}{4} \times 1 = 56.25$$

$$\text{Total mixture (A)} = 225 + 56.25 = 281.25 \text{ litre}$$

Milk in vessel B

$$= 900 \times \frac{\frac{54}{3.6}}{100} = 135 \ell$$

$$\text{Water} = \frac{135}{4} \times 1 = 33.75 \ell$$

$$\text{Total mixture (B)} = 135 + 33.75 \ell = 168.75 \ell$$

Milk in vessel C

$$= 900 \times \frac{\frac{108^\circ}{3.6}}{100} = 270$$

$$\text{Water} = \frac{270}{4} \times 1 = 67.50$$

$$\text{Total mixture (C)} = 270 + 67.50 = 337.50$$

$$\text{Total selling price} = 281.25 \times 14 + 168.75 \times 15 + 337.5 \times 16$$

$$= 3937.50 + 2531.25 + 5400 = 11868.75$$

Profit = total selling price – total milk price

$$\text{Milk price} = \frac{11868.75}{125} \times 100 = 9495$$

$$= 11868.75 - 9495 = 2373.75 \text{ Rs.}$$

45. Quantity of mixture in vessel A is 200 ℓ, 40ℓ mixture taken out from vessel A, and mixed in vessel B, again 40 liter mixture taken out from vessel A and mixed in vessel B. Find the ratio of milk in vessel A to water in vessel B in resulting mixture ?

- (a) 8 : 3 (b) 12 : 5 (c) 13 : 5 (d) 21 : 5 (e) 11 : 5

Sol. (b): Given

$$\frac{25}{100} \times X + \frac{90}{100} \times 4X = 200 \ell$$

$$X = 160 \text{ litre}$$

Mixture in vessel B

$$= 160 \times 4 \times \frac{\frac{54}{3.6}}{100} + 160 \times \frac{15}{100} = 120 = 120 \ell$$

According to the question —

$$\frac{\text{Vessel A}}{\text{Vessel B}} = \frac{200 - (40 + 40)}{120 + (40 + 40)}$$

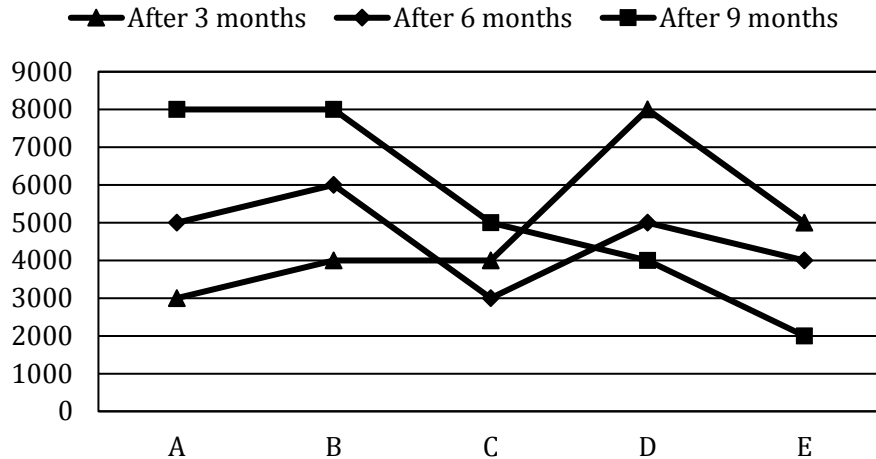
$$= \frac{120}{200} = 3 : 5$$

$$\text{Milk in vessel A} = 120 \times \frac{4}{5} = 96 \ell$$

$$\text{Water in vessel} = 200 \times \frac{1}{5} = 40 \ell$$

$$\text{Ratio} = \frac{96}{40} = \frac{12}{5} = 12 : 5$$

Directions (46-50): Line chart given below shows additional amount invested by different investors after 3 months, six months and 9 months of investment. Study the data carefully and answer the following questions.



Note: - For example: -

Initial investment of A = 5,000

Investment of A after 3 months = 5000+3000 = 8000

Investment of A after 6 months = 8000+5000 = 13000

Investment of A after 9 months = 13000+8000 = 21000

- 46.** A and C started a business together. 'C' worked for 10 months & left the business and 'A' worked for 12 months. A's initial investment is 50% more than C's initial investment. If A got Rs.3120 more profit than 'C' then find C's profit out of total profit.

(a) 3900 (b) 7020 (c) 4200 (d) 7320 (e) Cannot determined

Sol. (a): Let Initial investment of C = x

⇒ Initial investment of A = 1.5x

Ratio between A and C's profit.

$$= \frac{1.5x \times 3 + (1.5x + 3000) \times 3 + (1.5x + 8000) \times 3 + (1.5x + 16000) \times 3}{x \times 3 + (x + 4000) \times 3 + (x + 7000) \times 3 + (x + 12000) \times 3}$$

$$= \frac{18x + 81000}{10x + 45000}$$

Let, A's profit and C's profit be $(18xz + 81000z)$ and $(10xz + 45000z)$ respectively.

ATQ,

$$18xz + 81000z - 10xz - 45000z \rightarrow 3120$$

$$8xz + 36000z \rightarrow 3120$$

$$2xz + 9000z \rightarrow 780$$

$$C's \text{ profit} = 10xz + 45000z \rightarrow 780 \times 5 = 3900$$

- 47.** B and D both invested for six months in a business. Initial investment of both B and D is same. If out of total profit of Rs 41,250 B got Rs 18,750 then find initial investment of D?

(a) 4000 (b) 6000 (c) 8000 (d) 10000 (e) 12000

Sol. (c): Let initial investment of both B and D is Rs x

ATQ,

$$\frac{6x + 3 \times 4000}{6x + 3 \times 8000} = \frac{18750}{22500} = \frac{5}{6}$$

$$\Rightarrow 36x + 72,000 = 30x + 1,20,000$$

$$6x = 48,000$$

$$x = 8000$$

- 48.** If A and B's initial investment is Rs 12000 and Rs 10000 respectively then find B's share in profit is what percent less than A's share in profit if both invested for 12 months?

(a) $4\frac{1}{6}\%$ (b) 4% (c) $3\frac{1}{3}\%$ (d) 3% (e) $5\frac{1}{3}\%$

Sol. (b): Ratio between A and B's share in profit

$$= \frac{12 \times 12,000 + 9 \times 3000 + 6 \times 5000 + 3 \times 8000}{12 \times 10,000 + 9 \times 4000 + 6 \times 6000 + 3 \times 8000}$$

$$= \frac{2,25,000}{2,16,000} = \frac{25}{24}$$

$$\text{Required \%} = \frac{25-24}{25} \times 100 = 4\%$$

49. C and D started a business together. C invested for 10 months while D invested for 9 months. If ratio between C's and D's initial invested is 9 : 20 and ratio between profit share of C to total profit is 5 : 14 then find the total investment D after 6 months of starting of business?

- (a) 20,000 (b) 28,000 (c) 23,000 (d) 33,000 (e) 35,000

Sol. (d): Let Initial investment of C = 9x

⇒ Initial investment of D = 20x

Ratio between C and D's profit.

$$\frac{9x \times 3 + (9x + 4000) \times 3 + (9x + 7000) \times 3 + (9x + 12000) \times 3}{20x \times 3 + (20x + 8000) \times 3 + (20x + 13000) \times 3} = \frac{5}{9}$$

$$\Rightarrow \frac{90x + 45,000}{180x + 63,000} = \frac{5}{9}$$

$$\Rightarrow 9 \times (90x + 45,000) = 5 \times (180x + 63,000)$$

$$\Rightarrow 810x + 4,05,000 = 900x + 3,15,000$$

$$\Rightarrow 4,05,000 - 3,15,000 = 900x - 810x$$

$$\Rightarrow x = \frac{90,000}{90} = 1000$$

Amount invested by D initially = 20 × 1000 = 20,000

Total investment of D after 6 months of starting of business = 20,000 + 8000 + 5000 = 33,000

50. B and E started a business together. 'B' invested for 11 months while 'E' invested for 12 months. Out of total profit 20% is given to 'B' as an active partner and remaining is distributed between 'B' and 'E' according to their investments. At last profit share of B and D is equal. If initial investment of 'B' is Rs. 6,000, then find initial investment of 'E'?

- (a) Rs. 9,750 (b) Rs. 11,250 (c) Rs. 13,750
(d) Rs. 12,500 (e) Cannot be determined

Sol. (c): Let Total profit = Rs. 100x

Out of total profit 20% is given to 'B' and remaining is distributed between B and E such that total share of B in profit is same total share of E in profit

E's share in profit = 50x

B's share in profit = 50x

Ratio of investment of B and E = (50x - 20x) : 50x = 3 : 5

Let Initial investment of E = Rs. 'x'

Ratio between B and E's profit.

$$\frac{6,000 \times 3 + (6,000 + 4,000) \times 3 + (10,000 + 6,000) \times 3 + (16,000 + 8,000) \times 2}{x \times 3 + (x + 5000) \times 3 + (x + 9000) \times 3 + (x + 11000) \times 3} = \frac{3}{5}$$

$$\frac{1,44,000}{12x + 75,000} = \frac{3}{5}$$

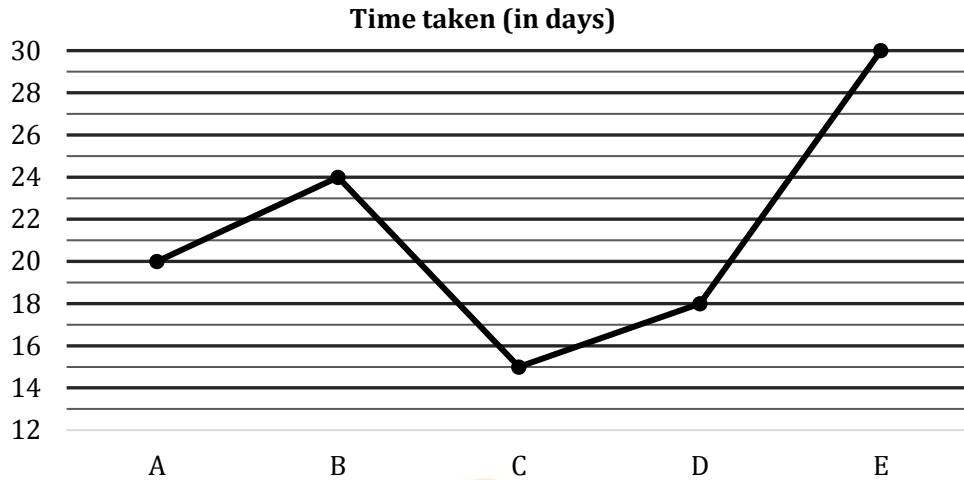
$$\Rightarrow 2,40,000 = 12x + 75,000$$

$$12x = 1,65,000$$

$$\Rightarrow x = 13,750$$

Practice MCQs for Prelims

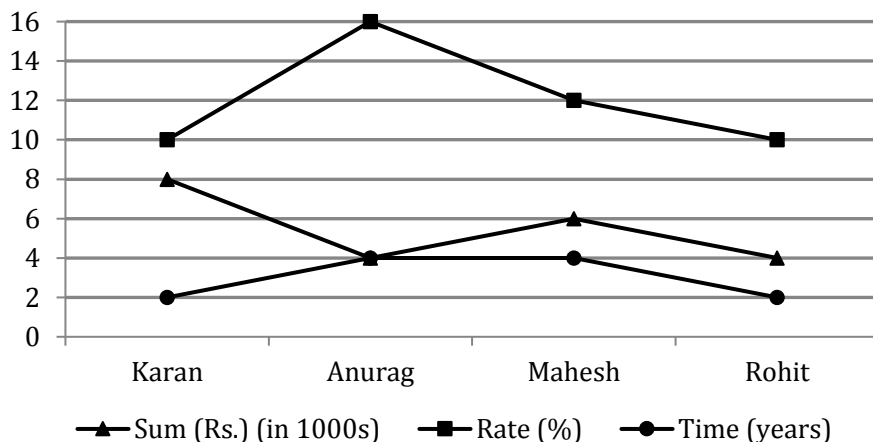
Direction (1-6):- The line graph shows the time taken by 5 persons to complete the same work alone. Study the given graph carefully and answer the following questions.



- Find the time taken by A and E to complete the work, when they work together?
(a) 15 days (b) 18 days (c) 12 days (d) 9 days (e) 10 days
- What is ratio of efficiencies of B, C and D?
(a) 12 : 24 : 15 (b) 15 : 24 : 20 (c) 15 : 18 : 24 (d) 20 : 18 : 15 (e) 15 : 20 : 24
- B and D starts working together on alternate days. find time taken by them to complete the work if D starts the work.
(a) $20\frac{2}{3}$ days (b) $18\frac{3}{4}$ days (c) $21\frac{1}{4}$ days (d) $20\frac{1}{2}$ days (e) $21\frac{3}{4}$ days
- If efficiency of E increased by 20%, then find time taken by E to complete the work?
(a) 36 days (b) 24 days (c) 40 days (d) 25 days (e) 20 days
- What is the difference between efficiencies of C and D?
(a) 1 (b) 3 (c) 4 (d) 2 (e) 5
- A, B and C starts doing the work, after 5 days of work A and C leaves and B complete the remaining work. Find in how many days work completed.
(a) 12 days (b) 10 days (c) 15 days (d) 14 days (e) 13 days

Directions (7-11): Given line graph shows the sum invested, rate of interest and time period of investment by 4 people. Study the data carefully and answer the questions.

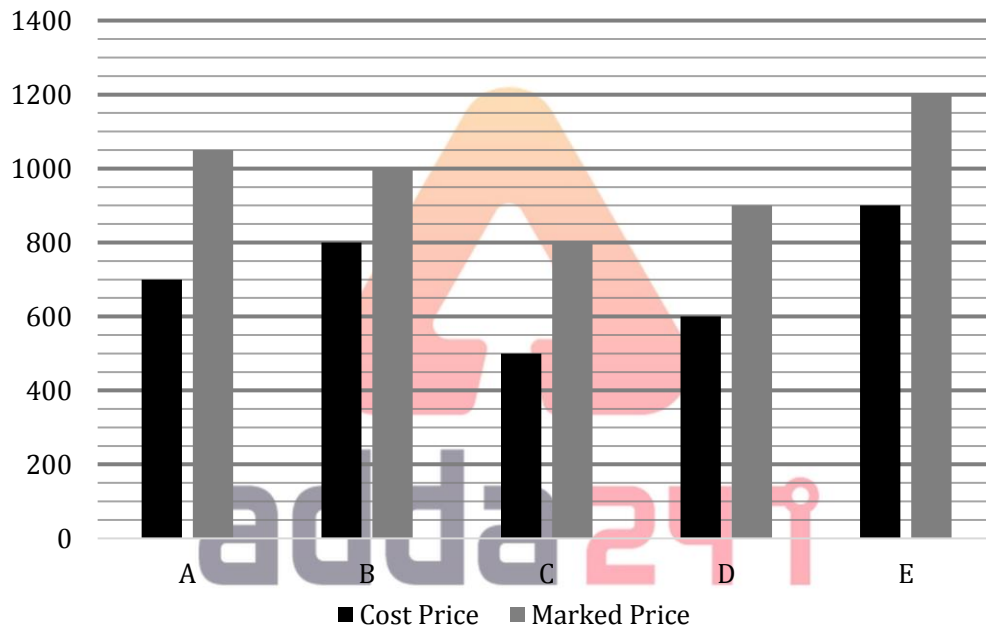
(NOTE: all invested their sum at simple interest)



7. How much will Rohit receive after completion of his investment period? (in Rs.)
 (a) 5200 (b) 6800 (c) 4800 (d) 4400 (e) 4600
8. Interest amount received by Mahesh is what percent more than interest amount received by Karan?
 (a) 85% (b) 60% (c) 75% (d) 70% (e) 80%
9. What is total amount received as interest by Anurag & Rohit together? (in Rs.)
 (a) None of these (b) 3150 (c) 3200 (d) 3360 (e) 3420
10. If Karan had invested same sum at compound interest at same rate of interest for same period. How much more would he earn?
 (a) Rs 80 (b) Rs 90 (c) Rs 70 (d) Rs 60 (e) None of these
11. Who among the four had received the highest amount as interest?
 (a) Karan (b) Anurag (c) Both Anurag & Mahesh
 (d) Rohit (e) Mahesh

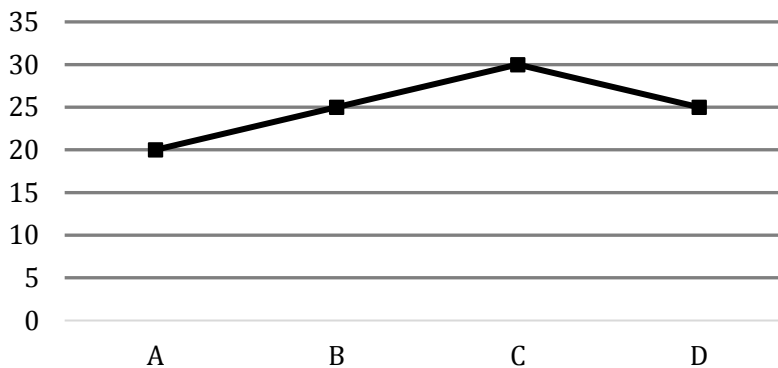
Directions (12-16): Study the bar chart carefully and answer the following questions.

Bar chart shows the marked price and cost price of 5 different articles (A, B, C, D & E) sold by the shopkeeper.



12. If shopkeeper allows 30% & 40% discount on A & D respectively, then find the total profit/loss earned by the shopkeeper on selling 1 unit each of A & D.
 (a) Rs.25 profit (b) Rs.40 loss (c) Rs.40 profit (d) None of the above. (e) Rs.25 loss
13. If ratio of selling price of B to that of E is 15 : 17 and shopkeeper earned Rs.220 on selling 1 unit each of B & E, then find selling price of B & E together is what percent of marked price of C? (shopkeeper earned profit on both B & E)
 (a) 250% (b) 280% (c) 270% (d) 240% (e) 260%
14. If shopkeeper earned Rs.180 on C and Rs.X on D and shopkeeper's overall profit% on selling 1 unit each of C & D is 30%, then find value of X.
 (a) 190 (b) 150 (c) 170 (d) 140 (e) 120
15. Find ratio of average cost price of A, C & E to average marked price of B, C & D.
 (a) 3 : 7 (b) 3 : 5 (c) 7 : 9 (d) 4 : 5 (e) 6 : 11
16. If shopkeeper started a scheme that on buying 5 units of E shopkeeper will only charge the marked price of 4 units of E, then find the profit % earned by the shopkeeper on selling every 5 units of E.
 (a) $11\frac{1}{3}\%$ (b) $6\frac{2}{3}\%$ (c) $8\frac{2}{3}\%$ (d) $15\frac{1}{3}\%$ (e) $13\frac{1}{3}\%$

Direction (17 – 21): Line graph shows marked up percentage of four articles above cost price and table shows marked price of these four articles. Read the data carefully and answer the questions.



Articles	Marked price (in Rs.)
A	720
B	500
C	1040
D	1500

17. If discounts allowed on A & D is $11\frac{1}{9}\%$ and $6\frac{2}{3}\%$ respectively, then find ratio of profit of A and D?
 (a) 1 : 4 (b) 1 : 5 (c) 2 : 5 (d) 1 : 6 (e) 3 : 5
18. If cost price of article 'E' is 50% more than that of B, then find at what price article 'E' should sale to make a profit of $16\frac{2}{3}\%$?
 (a) 700 Rs. (b) 1400 Rs. (c) 800 Rs. (d) 750 Rs. (e) None of these
19. If discount (in %) given on article B & D is in the ratio of 1 : 3 and ratio of profit on article B & loss on article D is same (in Rs) , then find discount allowed on article D?
 (a) 18% (b) 12% (c) 30% (d) 15 % (e) 24%
20. Cost price of A is what percent less than average cost price of B, C & D ?
 (a) 12% (b) 10% (c) 15% (d) 25% (e) 20%
21. Discount allowed on article C is 15% and selling price of article 'X' is Rs. 316 more than that of C. If profit made on 'X' is 20%, then find difference between cost price of D & X?
 (a) 300 Rs. (b) 600 Rs. (c) 400 Rs. (d) 200 Rs. (e) 100 Rs.

Directions (22-26): Given table provides the rate of interest on a certain sum in 1st, 2nd, 3rd & 4th year. All calculations are to be done as per compound interest compounding annually. Some data are missing which you have to find using the information provided in the question.

Study the data carefully and answer the questions.

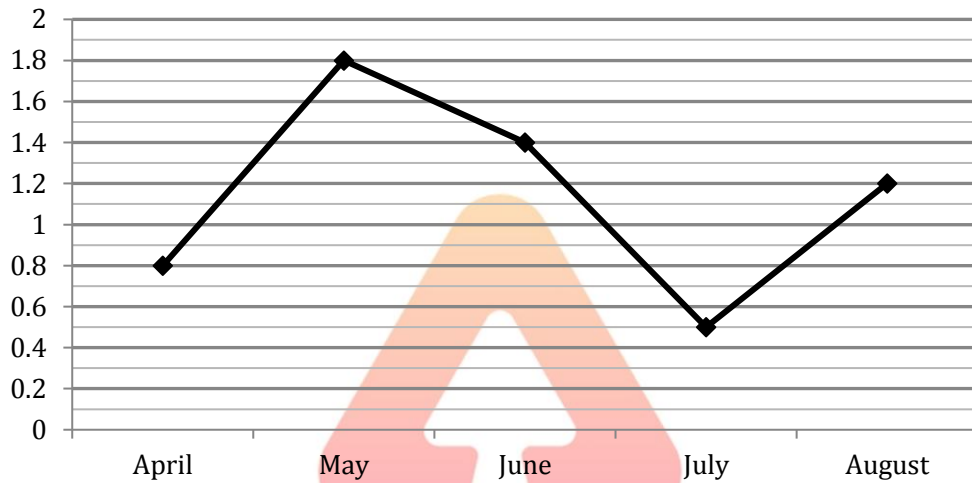
Year	Sum (in Rs.)			
	0-2000	2000-4000	4000-6000	6000-8000
1 st	5%	5%	5%	-
2 nd	5%	-	10%	10%
3 rd	10%	10%	-	-
4 th	-	15%	-	20%

[NOTE:- interest rate is given year wise not for the period.]

22. What will be the interest on a sum of Rs. 1500 for 3 years?
 (a) Rs. 300 (b) Rs. 180 (c) Rs. 375 (d) Rs. 319.125 (e) Rs. 325
23. If the interest earned on a sum of Rs. 5000 in 3 years is Rs. 2000. Find the interest rate for 3rd year. (approx.)
 (a) 21% (b) 23% (c) 19% (d) 25% (e) 27%

24. Akshay invested Rs. 8000 in a scheme offering interest as mentioned in table. After 3 years he get Rs. 10626. If schemes has provided third year interest rate as 15% pa, then find the rate for 1st year.
 (a) 3% (b) 4% (c) 5% (d) 6% (e) 10%
25. What is the ratio of amount received on a sum of Rs. 3000 for 3 years (if 2nd year rate of interest is same as 3rd year rate of interest) to amount received on a sum of Rs. 5000 for 3 years (if 3rd year rate of interest is 50% more than that of 2nd year)?
 (a) 33:115 (b) 22:115 (c) 3:5 (d) 22:23 (e) 66:115
26. The ratio of amount received on investing Rs. 8000 for 2 years and 3 years is 5:6. Find the rate of interest for 3rd year.
 (a) 15% (b) 20% (c) 25% (d) Cannot be determined (e) None of these

Direction (27–31): The following line graph shows the ratio of the selling price of a product 'x' to the cost price of that product over the period of five months in 2018.



27. If the discount given on product 'x' in the month of June was 20% and CP for the month was Rs. 26000. Determine marked price(M.P) of that product for the month of June.
 (a) Rs.45000 (b) Rs.47000 (c) Rs.46500 (d) Rs.45500 (e) Rs.42000
28. If C.P of the product 'x' for the month of April was Rs. 20,000 and got increased by 10% for the next two months. Determine the S.P of that product for the month of June.
 (a) Rs.31050 (b) Rs.33880 (c) Rs.35600 (d) Rs.39640 (e) Rs.37600
29. Find the ratio of total gains to total losses for the product 'x', if C.P for the product 'x' remains constant over the entire period of time.
 (a) 4:1 (b) 4:3 (c) 3:4 (d) 1:2 (e) 2:1
30. If S.P for the month of June for the product 'x' is Rs.21000 and C.P for the months of April and June is equal for that product, then find loss/gain% for the month of April.
 (a) 25% (b) 20% (c) 30% (d) 15% (e) none of these
31. Find in which month gain on the product 'x' was maximum?
 (a) May (b) June (c) August (d) none of these (e) can't be determined

Directions (32-36) :- Study the given table carefully and answer the following question.

The table given below shows the amount invested by 4 persons for different time and at different rates at SI. Some data are missing in this table and you have to calculate missing data according to the questions.

Persons	Principal (Rs)	Rate of interest	Time (Years)	Amount (Rs)
Sanjay	-	20%	4	11700
Praveen	5000	-	3	-
Deepak	7500	15%	-	10312.5
Harish	8000	-	2	9000

32. Interest earned by Sanjay is how much more/less than that of Harish?
 (a) Rs 3500 (b) Rs 4900 (c) Rs 4200 (d) Rs 3800 (e) Rs 4500
33. Find Deepak invested for how much time?
 (a) 3 years (b) 2.5 years (c) 3.5 years (d) 1.5 years (e) 2 years
34. Amount invested by Sanjay is how much percent more than amount invested by Praveen?
 (a) 30% (b) 24% (c) $23\frac{1}{13}\%$ (d) 35% (e) $23\frac{3}{13}\%$
35. If ratio of rate of interest for Deepak and Praveen is 3 : 5 then, find the ratio between amount incurred by Praveen and Deepak.
 (a) 31 : 33 (b) 14 : 11 (c) 29 : 22 (d) 28 : 33 (e) 26 : 33
36. If Harish and Praveen invested at same rate of interest then find interest earned by Praveen.
 (a) Rs 937.5 (b) Rs 945.5 (c) Rs 935.5 (d) Rs 957.5 (e) Rs 927.5

Directions (37-41) :- The data in the table given below shows the selling price, profit obtained and discount percentage on 4 items of a store. Some data are missing in this table and you have to calculate missing data according to the questions. Study the data carefully and answer the following questions.

Items	Selling price (Rs)	Profit (Rs)	Discount %
A	450	120	10%
B	-	75	12.5%
C	750	-	25%
D	1000	200	-

37. What is the marked price of the article A?
 (a) Rs 540 (b) Rs 460 (c) Rs 500 (d) Rs 600 (e) Rs 480
38. What is the selling price of the article B, if marked price of article B is 20% above the cost price?
 (a) Rs 1775 (b) Rs 1500 (c) Rs 1850 (d) Rs 1625 (e) Rs 1575
39. If ratio between profit earned on article B and article C is 3 : 4, find the cost price of article C?
 (a) Rs 650 (b) Rs 600 (c) Rs 680 (d) Rs 700 (e) Rs 600
40. Find the profit percentage earned on article D?
 (a) 20% (b) 22.5% (c) 15% (d) 25% (e) 17.5%
41. If profit amount on article B and discount amount of article B is same, then find the selling price of article B?
 (a) Rs 450 (b) Rs 525 (c) Rs 625 (d) Rs 575 (e) Rs 475

Directions (42-46) :- Table given below gives information about Cost price, Selling price, profit percent and discount percentage of four article A, B, C and D. Some data is missing, calculate the data and answer the following questions.

article	Cost price	Selling price	Profit %	Discount %
A	500	-	20%	25%
B	-	750	25%	$16\frac{2}{3}\%$
C	400	450	-	-
D	-	-	10%	45%

42. If cost price of article D is 10% more than cost price of article A, find Market price of article D?
 (a) Rs. 1000 (b) Rs. 1100 (c) Rs. 900 (d) Rs. 950 (e) Rs. 1050
43. Average of market price of article A and cost price of article B is how much percent more than cost price of article C?
 (a) 75% (b) 80% (c) 60% (d) 90% (e) 95%
44. If discount percentage is twice of profit percentage for article C, find ratio of cost price of article A to market price of article C?
 (a) 2:3 (b) 1:2 (c) 2:5 (d) 5:6 (e) None of these.

45. Selling price of article C is what percent of market price of article B?
 (a) 100% (b) 75% (c) 50% (d) 25% (e) 60%
46. If for article D difference between profit earned and discount given is Rs. 440, find selling price of the D?
 (a) 550 (b) 650 (c) 308 (d) 450 (e) 605

Directions (47-50): Table given below gives information about percentage of quantity of milk sold by Vikash to different persons i.e. (P, Q, R, S and T). Vikash has 1000 lit of pure milk out of which 60% are sold to these persons. Each person then adds some quantity of water to it and again replaces an amount of mixture with the equal amount of water. Some data is missing. Students are supposed to calculate the data and answer the questions that follows.

Person	% of milk bought	Concentration of water in % (after adding water in pure milk)	Quantity of water in final mixture in lit (after replacing an amount of mixture with same amount of water)	Quantity of milk in final mixture in lit.
P	12%	-	26	54
Q	-	16.67%	-	120
R	15%	-	69	-
S	18%	28%	78	-
T	30%	25%	-	153

47. Quantity of water initially added in pure milk by S is what percent more or less than quantity of mixture replaced with water by P.
 (a) 105% (b) 110% (c) 120% (d) 80% (e) 72%
48. If quantity of milk in final mixture for person R is 12.5% more than that of person S, then find amount of water added by R initially in pure milk.
 (a) 45 lit. (b) 50 lit. (c) 60 lit. (d) 75 lit. (e) 40lit.
49. Find quantity of water in the final mixture of Q.
 (a) 30 lit. (b) 50 lit. (c) 45 lit. (d) 60 lit. (e) 40 lit.
50. Cost price of pure milk is Rs. 200 per lit, then find approximate profit percent earned by T if he sells final mixture of water and milk at cost price of pure milk. Consider water is freely available.
 (a) 66% (b) 46% (c) 44% (d) 54% (e) 48%

Practice MCQs for Prelims_(Solutions)

51. (c): Let time taken by them be T days.

$$\begin{aligned} \text{ATQ} \\ T \left[\frac{1}{20} + \frac{1}{30} \right] &= 1 \\ \frac{1}{T} &= \frac{5}{60} \\ T &= 12 \text{ days} \end{aligned}$$

2. (b): Time taken by B, C and D to complete the work alone is 24 days, 15 days and 18 days respectively.
 So, ratio of their efficiency become $= \frac{1}{24} : \frac{1}{15} : \frac{1}{18} = 15 : 24 : 20$
3. (d): Let total work be 72 units (LCM)
 So, efficiency of B and D be 3 units/day and 4 units/day respectively.
 2-day work of B and D = 3 + 4 = 7 units
 So, 20-day work = 70 units

$$\text{Remaining work} = 72 - 70 = 2 \text{ units}$$

$$\text{So, required time} = 20 + \frac{2}{4} = 20 + 0.5 = 20.5 \text{ days}$$

4. (d): Required time $= 30 \times \frac{100}{120} = 25 \text{ days}$
5. (a): Let total work be 90 units.
 So, efficiency of C and D be 6 units/day and 5 units/day respectively.
 \therefore Required difference = 6 - 5 = 1 unit/day
6. (b): Let B completed the remaining work in x days.
 $5 \left[\frac{1}{20} + \frac{1}{24} + \frac{1}{15} \right] + \frac{x}{24} = 1$
 $\frac{x}{24} = 1 - \frac{95}{120}$
 $x = \frac{25}{120} \times 24 = 5 \text{ days}$
 So, required time 5 + 5 = 10 days

7. (c): amount received by Rohit
 $= 4000 + \frac{4000 \times 10 \times 2}{100} = \text{Rs. } 4800$
8. (e): interest amount received by Karan
 $= \frac{8000 \times 10 \times 2}{100} = \text{Rs. } 1600$
 Interest amount received by Mahesh
 $= \frac{6000 \times 12 \times 4}{100} = \text{Rs. } 2880$
 Required % = $\frac{2880 - 1600}{1600} \times 100 = 80\%$
9. (d): total interest amount received by Anurag & Rohit together
 $= \frac{4000 \times 16 \times 4}{100} + \frac{4000 \times 10 \times 2}{100} = \text{Rs. } 3360$
10. (a): interest received by Karan (SI)
 $= \frac{8000 \times 10 \times 2}{100} = \text{Rs. } 1600$
 Interest received by Karan (CI)
 $= 8000 \left(1 + \frac{10}{100}\right)^2 - 8000 = \text{Rs. } 1680$
 Required value = $1680 - 1600 = \text{Rs. } 80$
11. (e): Interest received by Karan = $\frac{8000 \times 10 \times 2}{100} = \text{Rs. } 1600$
 Interest received by Anurag
 $= \frac{4000 \times 16 \times 4}{100} = \text{Rs. } 2560$
 Interest received by Mahesh
 $= \frac{6000 \times 12 \times 4}{100} = \text{Rs. } 2880$
 Interest received by Rohit = $\frac{4000 \times 10 \times 2}{100} = \text{Rs. } 800$
 Clearly, Mahesh had received highest interest
12. (e): Selling price of A = $1050 \times \frac{70}{100} = \text{Rs. } 735$
 Selling price of D = $900 \times \frac{60}{100} = \text{Rs. } 540$
 Required profit/loss = $(735 - 700) + (540 - 600)$
 $= 35 - 60 = \text{Rs. } 25 \text{ loss}$
13. (d): Let selling price of B & E be Rs.15y and Rs.17y respectively.
 ATQ,
 $(15y - 800) + (17y - 900) = 220$
 $32y = 1920$
 $y = 60$
 So, selling price of B = $15y = \text{Rs. } 900$
 And, selling price of E = $17y = \text{Rs. } 1020$
 Required % = $\frac{900 + 1020}{800} \times 100 = 240\%$
14. (b): ATQ,
 $\frac{180 + X}{500 + 600} \times 100 = 30$
 $180 + X = 330$
 $X = 150$
15. (c): Average cost price of A, C & E = $\frac{700 + 500 + 900}{3} = \text{Rs. } 700$
 Average marked price of B, C & D = $\frac{1000 + 800 + 900}{3} = \text{Rs. } 900$
 Required ratio = $\frac{700}{900} = 7 : 9$
16. (b): Cost price of 5 units of E = $900 \times 5 = \text{Rs. } 4500$
 Selling price of 5 units of E = $1200 \times 4 = \text{Rs. } 4800$
 Required profit % = $\frac{4800 - 4500}{4500} \times 100 = 6\frac{2}{3}\%$
17. (b): Cost price of article A = $720 \times \frac{100}{120} = 600 \text{ Rs.}$
 Cost price of article D = $1500 \times \frac{100}{125} = 1200 \text{ Rs.}$
 Selling price of article, A = $720 \times \frac{8}{9} = 640 \text{ Rs.}$
 Selling price of article, D = $1500 \times \frac{14}{15} = 1400 \text{ Rs.}$
 Profit on article A = $640 - 600 = 40 \text{ Rs.}$
 Profit on article D = $1400 - 1200 = 200 \text{ Rs.}$
 Required ratio = $\frac{40}{200} = 1 : 5$
18. (a): Cost price of E = $500 \times \frac{100}{125} \times \frac{150}{100} = 600 \text{ Rs.}$
 For $16\frac{2}{3}\%$ profit article E sold on
 $= 600 \times \frac{7}{6} = 700 \text{ Rs.}$
19. (e): Cost price of article B = $500 \times \frac{100}{125} = 400$
 And, cost price of article D
 $= 1500 \times \frac{100}{125} = 1200 \text{ Rs.}$
 Let discount allowed on B = $X\%$
 And, discount allowed in D = $3X\%$
 And, ratio of profit on article B & loss on article D = $1 : 1$
 ATQ -
 $\frac{[500 - (500 \times \frac{X}{100})] - 400}{1200 - [1500 - (1500 \times \frac{3X}{100})]} = \frac{1}{1}$
 $(500 - 5X) - 400 = 1200 - (1500 - 45X)$
 $100 - 5X = -300 + 45X$
 $50X = 400$
 $X = 8\%$
 Discount allowed on article D = $3 \times 8 = 24\%$
20. (d): Cost price of article A = $720 \times \frac{100}{120} = 600 \text{ Rs.}$
 Cost price of article B = $500 \times \frac{100}{125} = 400 \text{ Rs.}$
 Cost price of article C = $1040 \times \frac{100}{130} = 800 \text{ Rs.}$
 Cost price of article D = $1500 \times \frac{100}{125} = 1200 \text{ Rs.}$
 average cost price of B, C & D = $\frac{400 + 800 + 1200}{3} = 800 \text{ Rs.}$
 Required percentage = $\frac{800 - 600}{800} \times 100$
 $= \frac{200}{800} \times 100 = 25\%$
21. (d): Selling price of article C = $1040 \times \frac{85}{100} = 884 \text{ Rs.}$
 Selling price of article X = $884 + 316 = 1200 \text{ Rs.}$
 Cost price of article X = $1200 \times \frac{100}{120} = 1000 \text{ Rs.}$
 Cost price of article D = $1500 \times \frac{100}{125} = 1200 \text{ Rs.}$
 Required difference = $1200 - 1000 = 200 \text{ Rs.}$

$$22. (d): \text{Interest for 3 years} = 1500 \times \frac{105}{100} \times \frac{105}{100} \times \frac{110}{100} - 1500 = \text{Rs. } 319.125$$

$$23. (a): \text{Let rate of 3rd year be } R\% \\ \text{ATQ, } 5000 \times \frac{105}{100} \times \frac{110}{100} \times \left(1 + \frac{R}{100}\right) - 5000 = 2000 \\ R = 21\%(\text{approx.})$$

$$24. (c): \text{Let rate of 1st year be } R\% \\ \text{ATQ, } 8000 \times \left(1 + \frac{R}{100}\right) \times \frac{110}{100} \times \frac{115}{100} = 10626 \\ R = 5\%$$

$$25. (e): \text{Required ratio} \\ = \frac{3000 \times \frac{105}{100} \times \frac{110}{100} \times \frac{110}{100}}{5000 \times \frac{105}{100} \times \frac{110}{100} \times \frac{115}{100}} = \frac{3000 \times 110}{5000 \times 115} = 66:115$$

$$26. (b): \text{Let rate for 1st year and 3rd year be } R\% \text{ and } X\% \text{ respectively.} \\ \text{ATQ, } \frac{8000 \times \left(1 + \frac{R}{100}\right) \times \frac{110}{100}}{8000 \times \left(1 + \frac{R}{100}\right) \times \frac{110}{100} \times \left(1 + \frac{X}{100}\right)} = \frac{5}{6} \Rightarrow X = 20\%$$

$$27. (d): \text{For the month of June} = \frac{S.P}{C.P} = 1.4 \\ \text{And C.P} = \text{Rs. } 26000 \\ \text{So, S.P} = \text{Rs. } 36400 \\ \text{So, M.P} = \text{Rs. } \frac{36400}{0.8} = \text{Rs. } 45500$$

$$28. (b): \text{Given C.P of product 'x' = 20,000} \\ \text{For the month of April.} \\ \text{So, C.P in June} = \text{Rs. } (20,000 \times 1.1 \times 1.1) = 24200 \\ \text{So, S.P of product 'x' in June} = \text{Rs. } (24200 \times 1.4) = \text{Rs. } 33880.$$

$$29. (e): \text{Let the C.P of the product 'x' was Rs. } y \text{ which remains constant for all the months.} \\ \text{Since the ratio of S.P and C.P in the month of April and July is less than 1} \\ \text{So losses for the above months} = (.2y + .5y) = .7y \\ \text{And the ratio of S.P and C.P in the month of May, June and August is more than 1} \\ \text{So gains for the above months} = (.8y + .4y + .2y) = 1.4y \\ \text{Required ratio} = 2:1$$

$$30. (b): \text{C.P for the month of June} = \text{Rs. } \frac{21000}{1.4} = \text{Rs. } 15000 \\ \text{So, C.P of month of April} = \text{Rs. } 15000 \\ \text{S.P for the month of April} = \text{Rs. } (15000 \times .8) = \text{Rs. } 12000 \\ \text{So required loss\%} = \frac{15000 - 12000}{15000} \times 100 = 20\%$$

$$31. (e): \text{Since C.P for the product 'x' is not known for any individual month} \\ \text{So, we can't determine the difference}$$

$$32. (c): \text{let Sanjay earned Rs } S \text{ as interest.}$$

$$\text{So, } S = \frac{(11700 - S) \times 20 \times 4}{100}$$

$$\frac{5S}{4} = 11700 - S$$

$$\frac{9S}{4} = 11700$$

$$S = 5200$$

$$\therefore \text{required difference} = 5200 - (9000 - 8000) = 5200 - 1000 = \text{Rs } 4200$$

$$33. (b): \text{required time} = \frac{(10312.5 - 7500) \times 100}{7500 \times 15} = \frac{2812.5}{75 \times 15} = 2.5 \text{ years}$$

$$34. (a): \text{let Sanjay earned Rs } S \text{ as interest.}$$

$$\text{So, } S = \frac{(11700 - S) \times 20 \times 4}{100}$$

$$\frac{5S}{4} = 11700 - S$$

$$\frac{9S}{4} = 11700$$

$$S = 5200$$

$$\text{So, principle} = 11700 - 5200 = \text{Rs } 6500$$

$$\therefore \text{required percentage} = \frac{6500 - 5000}{5000} \times 100 = 30\%$$

$$35. (d): \text{interest earned by Praveen}$$

$$= \frac{5000 \times 15 \times \frac{5}{3} \times 3}{100} = \text{Rs } 3750$$

$$\text{So, Required ratio} = \frac{5000 + 3750}{10312.5} = \frac{8750}{10312.5} = \frac{28}{33}$$

$$36. (a): \text{rate of interest} = \frac{1000 \times 100}{8000 \times 2} = 6.25\%$$

$$\text{So, required interest} = \frac{5000 \times 6.25 \times 3}{100} = \text{Rs } 937.5$$

$$37. (c): \text{Marked price of article A} = 450 \times \frac{100}{90} = \text{Rs } 500$$

$$38. (e): \text{let cost price of article B be Rs } 10x.$$

$$\text{ATQ}$$

$$10x + 75 = 10x \times \frac{120}{100} \times \frac{87.5}{100}$$

$$10x + 75 = 10.5x$$

$$x = 150$$

$$\text{So, selling price of article B}$$

$$= 1500 + 75 = \text{Rs } 1575$$

$$39. (a): \text{Cost price of article C} = 750 - 75 \times \frac{4}{3} = 750 - 100 = \text{Rs } 650$$

$$40. (d): \text{Required profit percentage}$$

$$= \frac{200}{1000 - 200} \times 100 = \frac{200}{800} \times 100 = 25\%$$

$$41. (b): \text{let marked price of article B be Rs } 100x.$$

$$\text{ATQ}$$

$$12.5x = 75$$

$$\text{So, selling price} = 87.5x = 75 \times \frac{87.5}{12.5} = \text{Rs } 525$$

$$42. (b): \text{Cost price of article D} = 500 \times \frac{110}{100} = \text{Rs. } 550$$

$$\text{Market price of article D} = 550 \times \frac{110}{100} \times \frac{100}{55}$$

$$= \text{Rs. } 1100$$

- 43. (a):** Market price of article A
 $= 500 \times \frac{120}{100} \times \frac{100}{75} = \text{Rs. } 800$
 Cost price of article B $= \frac{750}{125} \times 100 = \text{Rs. } 600$
 Average price $= \frac{800+600}{2} = \text{Rs. } 700$
 Required percentage $= \frac{700-400}{400} \times 100 = 75\%$
- 44. (d):** Discount% for article C $= 2 \times \frac{450-400}{400} \times 100 = 25\%$
 Market price of article C $= \frac{450}{75} \times 100 = \text{Rs. } 600$
 Required ratio $= 500:600 = 5:6$
- 45. (c):** Market price of article B $= \frac{750}{250} \times 300 = \text{Rs. } 900$
 Required percentage $= \frac{450}{900} \times 100 = 50\%$
- 46. (e):** let cost price of article D = Rs.100x
 Selling price of article D $= 100x \times \frac{110}{100} = \text{Rs. } 110x$
 Market price of article D $= \frac{110x}{55} \times 100 = \text{Rs. } 200x$
 ATQ
 $(200x - 110x) - (110x - 100x) = 440$
 $300x - 220x = 440$
 $80x = 440$
 $x = \frac{440}{80}$
 $x = \frac{11}{2}$
 So, $110x = 110 \times \frac{11}{2}$
 $110x = \text{Rs. } 605$
- 47. (b):** For person S
 Quantity of water initially added by S in pure milk
 $= 1000 \times \frac{60}{100} \times \frac{18}{100} \times \frac{28}{72} = 42 \text{ lit.}$
 For person P
 Quantity of pure milk $= 1000 \times \frac{60}{100} \times \frac{12}{100} = 72 \text{ lit.}$
 Percentage of mixture replaced $= \frac{72-54}{72} \times 100 = 25\%$

Final mixture $= 54 + 26 = 80 \text{ lit}$
 Amount of mixture replaced with water $= 80 \times \frac{25}{100} = 20 \text{ lit.}$
 Required percentage $= \frac{42-20}{20} \times 100 = 110\%$

- 48. (c):** For person S
 Quantity of water initially added by S in pure milk
 $= 1000 \times \frac{60}{100} \times \frac{18}{100} \times \frac{28}{72} = 42 \text{ lit.}$
 Final quantity of mixture $= 1000 \times \frac{60}{100} \times \frac{18}{100} + 42 = 150 \text{ lit.}$
 Quantity of milk in final mixture $= 150 - 78 = 72 \text{ lit}$
 For person R
 Quantity of pure milk $= 1000 \times \frac{60}{100} \times \frac{15}{100} = 90 \text{ lit.}$
 Quantity of milk in final mixture $= 72 \times \frac{112.5}{100} = 81 \text{ lit.}$
 Amount of water added In pure milk initially
 $= 69 + 81 - 90 = 60 \text{ lit.}$
- 49. (d):** Quantity of water initially added by Q in pure milk
 $= 1000 \times \frac{60}{100} \times \frac{25}{100} \times \frac{50/3}{100-50/3} = 30 \text{ lit.}$
 Quantity of milk which is replaced with water $= 150 - 120 = 30 \text{ lit.}$
 Quantity of water in the final mixture $= 30 + 30 = 60 \text{ lit.}$
- 50. (e):** Quantity of pure milk for T $= 1000 \times \frac{60}{100} \times \frac{30}{100} = 180 \text{ lit.}$
 Quantity of water initially added by T in pure milk
 $= 1000 \times \frac{60}{100} \times \frac{30}{100} \times \frac{25}{75} = 60 \text{ lit.}$
 Quantity of water in the final mixture of T $= 240 - 153 = 87 \text{ lit}$
 Required profit percent
 $= \frac{87}{180} \times 100 = 48.33\% = 48\%$

Practice MCQs for Mains

Directions (1-5): Table given below gives information about cost price, selling price, profit/loss%(+ve/-ve) and discount % of five different articles, some data are missing in the table calculate the data according to information and answer the following questions.

Article	Cost price	Selling price	Profit/loss%	Discount%
A		600		
B	500	200		68%
C				10%
D	150		$-33\frac{1}{3}\%$	
E	450		$11\frac{1}{9}\%$	$16\frac{2}{3}\%$

1. If for article C profit earned is Rs.100 more than discount given and market price of article C is Rs. 650 more than selling price of article D, find cost price of article C?
 (a) Rs. 675 (b) Rs. 525 (c) Rs. 550 (d) Rs. 625 (e) Rs. 500

2. If article A is marked 100% above cost price and discount percentage is half of profit percentage, find market price for the same article?
 (a) Rs. 800 (b) Rs. 600 (c) Rs. 750 (d) Rs. 1000 (e) Rs. 650
3. Profit earned on article E is approximately how much percent less than loss incurred on article B?
 (a) 66% (b) 83% (c) 111% (d) 133% (e) 87%
4. What is the ratio of market price of article B to market price of article C, if selling price of article C is Rs.675?
 (a) 2:3 (b) 1:1 (c) 4:5 (d) 5:6 (e) None of these.
5. Selling price of E is how much percent more than cost price of article D?
 (a) 200% (b) 150% (c) $166\frac{2}{3}\%$ (d) $233\frac{1}{3}\%$ (e) None of these.

Directions (6-10): Study the table given below and answer the following questions. Some data is missing in the table. The date in the table shows the profit percentage earned by the five sellers on selling two types of articles A and B and discount percentage offered by the sellers.

The marked price of each article sold by each seller is same while cost price may vary.

Articles Sellers	A		B	
	Profit	Discount	Profit	Discount
P	30%	—	25%	10%
Q	40%	25%	—	12.5%
R	15%	—	—	32.5%
S	35%	42%	—	12.5%
T	—	20%	—	6.25%

6. For seller R, when article B is sold at 20% profit, then cost price of article A become Rs. 20 more than cost price of article B and average cost price of article A and B is Rs. 122.5. find M.R.P. for article B?
 (a) Rs 550 (b) Rs 450 (c) Rs 300 (d) Rs 200 (e) Rs 625
7. Find the ratio of cost price of article B for seller S to cost price of article A for seller T, if profit % of article B sold by S and profit % of article A sold by T is 75% and 40% respectively.
 (a) 7 : 8 (b) 6 : 7 (c) 7 : 9 (d) 8 : 7 (e) 7 : 6
8. Profit percentage gained by seller Q on selling of article B is 25% and discount percentage offered by seller P on selling article A is 15%. If the difference between selling price of article A sold by seller P and cost price of article B sold by seller Q is Rs 390, then find cost price of article A for seller P.
 (a) Rs 1600 (b) Rs 1700 (c) Rs 1650 (d) Rs 1800 (e) Rs 1725
9. If cost price of the article A sold by the seller P is Rs 3360 on which he offered 16% discount, then find the cost price of article A sold by seller P is approximately what percent of cost price of article B for seller P?
 (a) 84% (b) 76% (c) 90% (d) 96% (e) 72%
10. If cost price of article B for seller P is same as cost price of article A for seller R. find discount percentage offered by seller R on article A.
 (a) 19.6% (b) 24.4% (c) 12.8% (d) 15.5% (e) 17.2%

Directions (11-16): Study the table given below and answer the following questions.

Table shows the data regarding five different types of laptop (HP x360, ASUS Vivobook, DELL Inspiron, Macbook Air, Lenovo Yoga & Microsoft Surface) sold by a store in a month. Some data is missing in the table. You have to calculate that missing data according to the information given in the questions.

Laptops	Units sold	Price of each unit		
		Cost Price (in Rs.)	Selling Price (in Rs.)	Marked Price (in Rs.)
Macbook Air	15	----	65000	-----
Microsoft Surface	10	----	----	100000
HP x360	-----	50000	-----	80000
ASUS Vivobook	-----	----	60000	75000
DELL Inspiron	20	40000	----	
Lenovo Yoga	-----	45000	60000	-----

Note – Store earned profit on each laptop.

11. If total revenue from sales of all Macbook Air is 2.5% less than that of from sales of all DELL Inspiron and ratio of cost price of 1 unit of Lenovo Yoga to that of Macbook Air is 9 : 10, then find overall profit percentage earned by the store from the sales of all Macbook Air and all DELL Inspiron.

- (a) $18\frac{13}{31}\%$ (b) $24\frac{13}{31}\%$ (c) $35\frac{13}{31}\%$ (d) $27\frac{13}{31}\%$ (e) None of the above.

12. If ratio of units sold of ASUS Vivobook, DELL Inspiron & HP x360 is 5 : 4 : 4 respectively and discount allowed on ASUS Vivobook is 50% more than discount allowed on HP x360, then find total revenue of store from sales of all ASUS Vivobook & all HP x360 together.
 (a) Rs.25,00,000 (b) Rs.29,00,000 (c) Rs.28,00,000 (d) Rs.26,00,000 (e) Rs.27,00,000
13. If ratio of profit earned on selling 1 unit of Microsoft Surface to that of on 1 unit of Lenovo Yoga is 1 : 3 and profit earned on 1 unit of Microsoft Surface is 25% of discount allowed on 1 unit of Microsoft Surface, then find average of cost price of 1 unit each of Microsoft Surface, HP x360, DELL Inspiron & Lenovo Yoga.
 (a) Rs.45,000 (b) Rs.80,000 (c) Rs.67,500
 (d) Cannot be determined. (e) None of the above.
14. If Macbook Air is marked 100% above its cost price and cost price of 1 unit of Microsoft Surface is 60% of marked price of 1 unit of Macbook Air, then find total cost price of all Macbook Air is what percent of total cost price of all DELL Inspiron. (Total revenue of the store from the sales of Microsoft Surface is Rs.9,00,000 and store earned 50% profit by selling all Microsoft Surface)
 (a) 92.75% (b) 82.75% (c) 93.75% (d) 98.75% (e) 87.75%
15. If selling price of 1 unit each of HP x360 and DELL Inspiron is same and total revenue of store from the sales of all units of HP x360 and DELL Inspiron together is Rs.21,00,000, then find total units sold by the store of HP x360. (Store earned total profit of Rs.5,50,000 on selling all units of HP x360 and DELL Inspiron)
 (a) 15 units (b) 16 units (c) 12 units (d) 25 units (e) 10 units
16. If total revenue of the store from all Macbook Air is 65% of total revenue of the store from the all Lenovo Yoga and cost price of 1 unit of Macbook Air is Rs.30,000 less than the average of marked price of 1 unit each of Microsoft Surface, HP x360 & ASUS Vivobook, then find total profit earned by the store on selling all Macbook Air and all Lenovo Yoga.
 (a) Rs.5,75,000 (b) Rs.5,50,000 (c) Rs.6,00,000 (d) Rs.5,25,000 (e) Rs.5,00,000

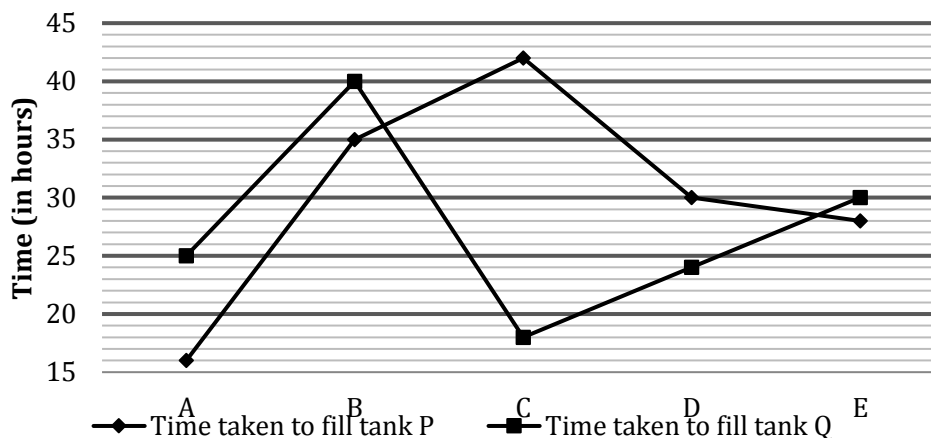
Direction (17 – 20) : Given below table shows discount allowed on four different items (P, Q, R & S) in four different states (A, B, C & D). Read the data carefully and answer the questions. Given that MRP and CP of each item for all states is same.

	A	B	C	D
P	20%	—	10%	40%
Q	10%	—	30%	—
R	15%	10%	—	—
S	20%	10%	—	—

17. If sum of selling price of P in state A, B & C is Rs. 10000 and sum of selling price of same item in C & D is Rs. 6000, then find discount allowed on item P in the state B?
 (a) 25% (b) 12% (c) 10% (d) 20% (e) 15%
18. Average selling price of R in state A & B is Rs. 7000 and ratio of discount allowed on R in state C & D is 2 : 1. If average selling price of R in state C & D is Rs. 7400, then find discount allowed on R in state C?
 (a) 5% (b) 12% (c) 10% (d) 8% (e) 7.5%
19. Percentage discount allowed on Q in state B is 150% more than that of allowed on Q in state A. If profit on Q in state A is 35%, then find the profit percentage on same article in state B?
 (a) 5% (b) 12% (c) 10% (d) 8% (e) 12.5%
20. If average of discount allowed in A & C on item S is Rs. 1050 and average of discount allowed in B & C on same item is Rs. 750, then find discount allowed on S in C?
 (a) 1750 Rs. (b) 1200 Rs. (c) 1500 Rs. (d) 900 Rs. (e) 750 Rs.

Directions (21-25): Study the line chart given below and answer the following questions.

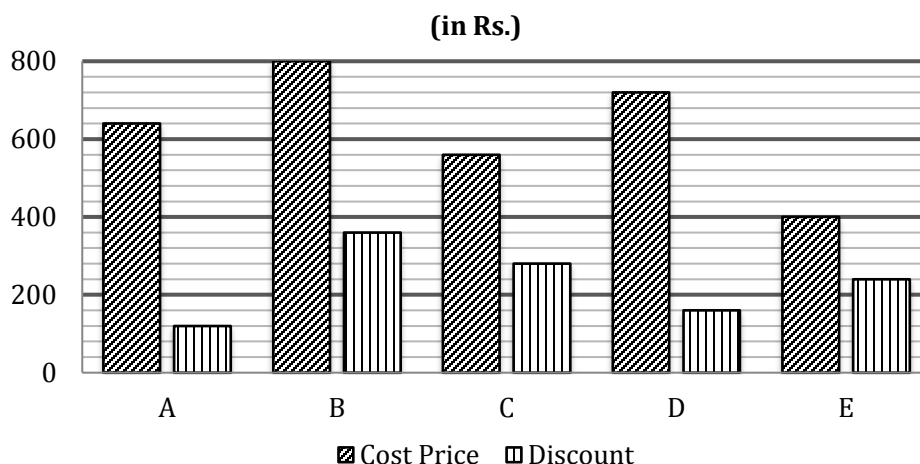
Line chart shows the time taken by 5 pipes (A, B, C, D & E) to fill tank – P & tank – Q individually.



21. Total capacity of tank - P is 360 liters more than total capacity of tank - Q. Pipe - B fills tank - Q in $33\frac{1}{3}$ hours when it fills tank - Q with same efficiency with which it filled tank - P. Find total capacity of tank - P & Q together?
 (a) 12840 liters (b) 13620 liters (c) 13180 liters (d) 14760 liters (e) 14340 liters
22. Pipe - A, C & E filled tank - Q in $29\frac{1}{3}$ hours when they opened alternatively such that pipe - A fills in 1st hour, followed by pipe - C and then followed by pipe - E and pipe - C filled tank - Q with the efficiency with which it filled tank - P, then find total capacity of tank - P is what percent of that of tank - Q?
 (a) $114\frac{1}{3}\%$ (b) $121\frac{1}{3}\%$ (c) $95\frac{2}{3}\%$
 (d) Cannot be determined. (e) None of the above.
23. Time taken by C & E together to fill tank - P is what percent of time taken by B & D together to fill tank - Q?
 (a) 128% (b) 112% (c) 124% (d) 120% (e) 116%
24. Total capacity of tank - P is 3000 liters more than that of tank - Q. When pipe - B & D together filled tank - Q, then water supplied by pipe - D is 3375 liters. Find quantity of water supplied by pipe - A & E together in 6 hours in tank - P.
 (a) 4950 liters (b) 5450 liters (c) 4250 liters (d) 5950 liters (e) 6650 liters
25. Water supplied by pipe - B, C & E together in tank - P in 5 hours is $57\frac{5}{9}\%$ of total capacity of tank - Q and pipe - A can fill 5040 liters in tank - Q in 14 hours. Find in how many hours pipe - D can fill 8232 liters in tank - P?
 (a) 14 hours (b) 16 hours (c) 23 hours (d) 17 hours (e) 21 hours

Directions (26-30): Study the bar chart given below and answer the following questions.

Bar chart shows the cost price of 5 different articles (A, B, C, D & E) and amount of discount allowed on these 5 articles.

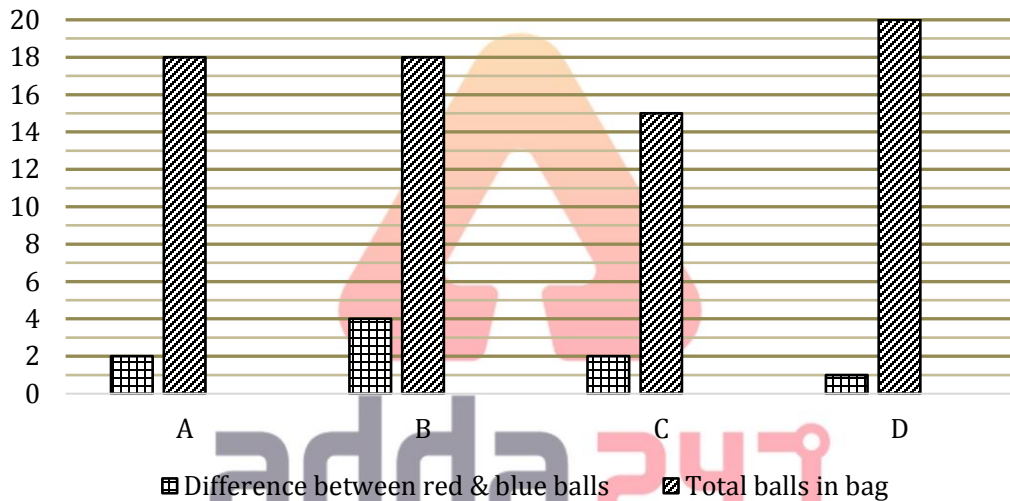


26. Selling price of A is Rs.260 more than that of C and selling price of C is 50% more than discount allowed on C. Find marked price of A & C together is what percent of cost price of B & E together.

- (a) 75% (b) 125% (c) 175% (d) 100% (e) 150%

27. D is marked $33\frac{1}{3}\%$ above its cost price and amount of profit on B is 27.5% of marked price of B. If cost price of article – F is equal to selling price of article – B and selling price of article – F is 60% more than selling price of article – D, then find profit earned on article – F.
 (a) Rs.150 (b) Rs.110 (c) Rs.70 (d) Rs.90 (e) Rs.40
28. Ratio of marked price of E to profit earned on E is 25 : 9 and marked price of C is equal to cost price of B. Find selling price of C & E together are how much more or less than cost price of A & B together?
 (a) Rs.200 (b) Rs.120 (c) Rs.40 (d) Rs.160 (e) Rs.80
29. Marked price of A & B together is Rs.2000 and ratio of selling price of A to that of B is 17 : 21. Find amount of profit/loss earned by a person, if he sold 12 units of article – A and 17 units of article – B.
 (a) Rs.1160 (b) Rs.1540 (c) Rs.1820 (d) Rs.820 (e) Rs.640
30. Profit earned on B is equal to that earned on E and selling price of B is equal to marked price of D. If selling price of D is 84% of its marked price, then find marked price of B & E together.
 (a) Rs.2340 (b) Rs.2280 (c) Rs.2200 (d) Rs.2480 (e) Rs.2400

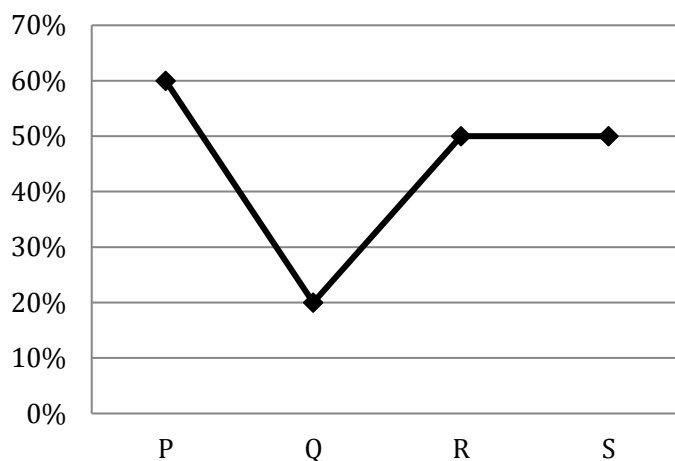
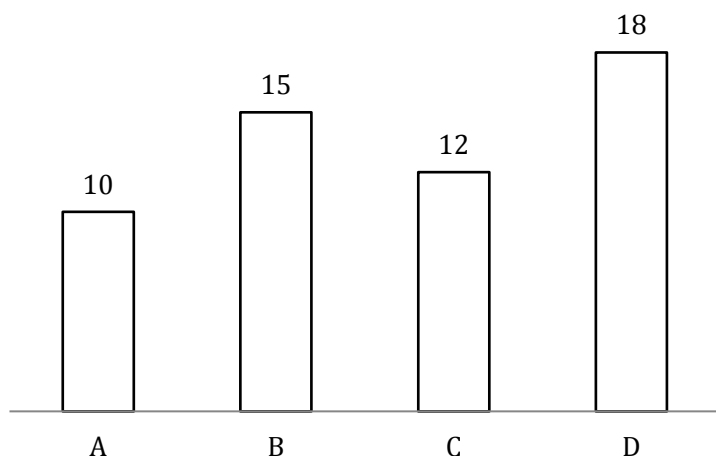
Direction (31 - 34) : Bar graph given below shows difference between red and blue balls in four different bags and total number of balls in these four bags. Read the data carefully and answer the questions.



Note – Each bag contains three color of balls = Red + Blue + Green

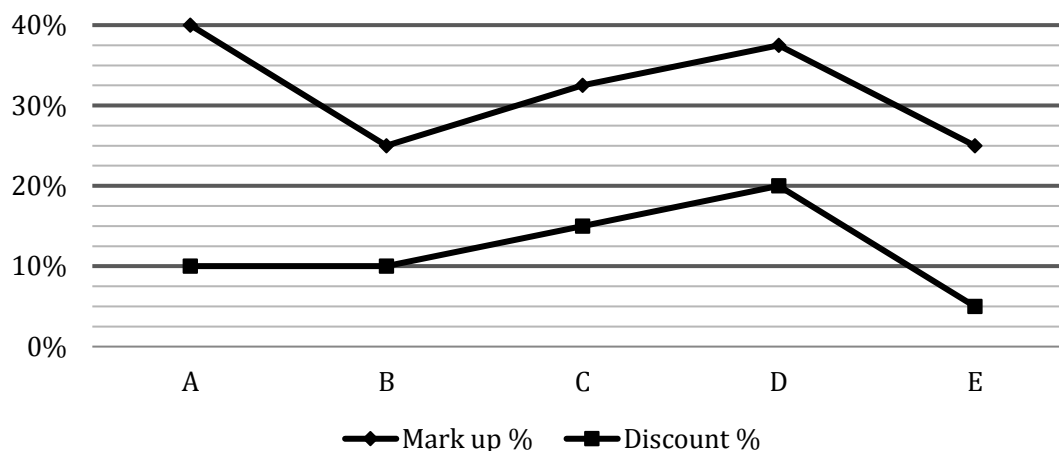
31. If three balls are taken out from the bag C, then what will be probability such that maximum red balls are left in the bag?
 (a) $\frac{2}{3}$ (b) $\frac{8}{15}$ (c) $\frac{2}{5}$ (d) $\frac{3}{5}$ (e) None of these
32. If one ball is taken out from each bag C & D and probability of both the balls being Red is $\frac{13}{15}$, then find difference between Green balls in both the bags? (Given- red balls > blue balls in both bags and ratio of red balls in bag C to that of in bag D is 7 : 8)
 (a) 0 (b) 4 (c) 3 (d) 1 (e) 2
33. If one ball is taken out from bag B and probability of that ball being blue is $\frac{2}{9}$, then find the ratio of green balls to red balls in the bag B?
 (a) 1 : 2 (b) 3 : 4 (c) 3 : 8 (d) 2 : 3 (e) 4 : 5
34. Red balls are more than blue balls in both bags A & C and ratio of blue balls in bag A to that of in bag C is 6:5. If One ball from the bag A and two balls from the bag C are taken out and difference between probability of balls taken out from both the bag being red is $\frac{11}{45}$, then what is the total number of green balls in bag A & bag C together?
 (a) 9 (b) 5 (c) 6 (d) 7 (e) 8

Direction (35 - 39): the following bar graph shows the number of days taken by different persons to complete a work and line graph shows the percentage of more number of days taken by another different persons to complete the same work with respect to the given four persons.



35. B & C together started the work and after 5 days, they left the work. What is the time taken by S to complete the remaining work?
 (a) $7\frac{1}{2}$ days (b) $6\frac{3}{4}$ days (c) $3\frac{3}{4}$ days (d) $5\frac{3}{4}$ days (e) None of these
36. A and R together started to do a work. After some days, A left the work and remaining work was completed by R alone in 4 days. Find the number of days after which A left the work?
 (a) 6 days (b) 4 days (c) 5 days (d) $7\frac{1}{2}$ days (e) 10 days.
37. R and D under take to do the work for Rs. 5600. With the help of C, they completed the whole work in $5\frac{1}{7}$ days. Find the share of C?
 (a) Rs. 2400 (b) Rs. 3000 (c) Rs. 1800 (d) Rs. 3600 (e) Rs. 2700
38. P & Q started another work which is 150% of the given work. With the help of X, they all together completed this work in 8.64 days. Find the time taken by X alone to do the given work?
 (a) 12 days (b) 20 days (c) 24 days (d) 16 days (e) 18 days
39. Y is 100% more efficient than Q. In how many days $\frac{2}{3}$ rd of the work will be completed if both of them are working simultaneously?
 (a) 5 days (b) 3 days (c) 4 days (d) $3\frac{1}{2}$ days (e) 6 days.

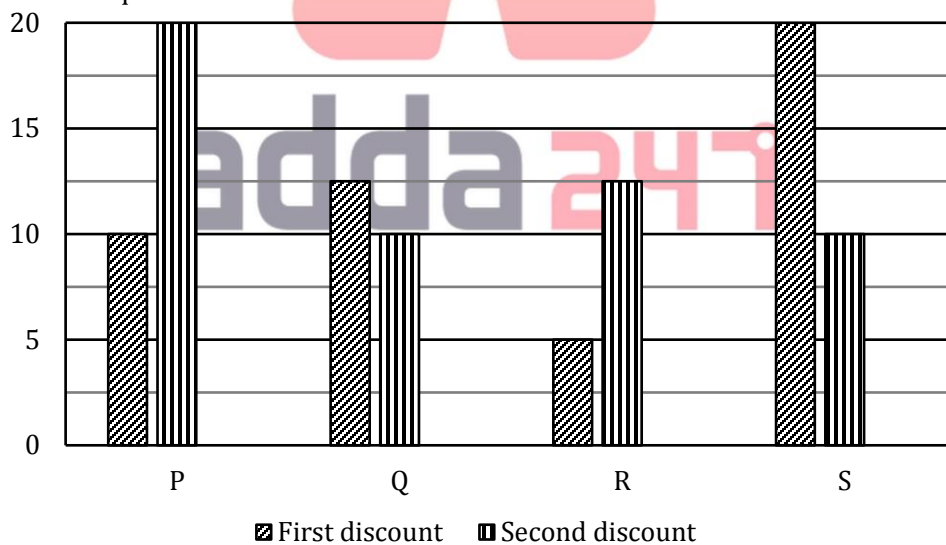
Direction (40 - 43): Line chart given below shows markup % above Cost price and discount % given on article P by five different shops, while table given below shows ratio between mark price of article P to mark price of article Q in these five different shops. Study the data carefully and answer the following questions.



Shops	Mark price of P : Mark price of Q
A	4 : 5
B	3 : 4
C	11 : 14
D	7 : 9
E	5 : 7

40. Cost price of article P in shop D is 25% more than cost price of same article in shop A. and shop D made a profit of Rs. 150 on selling article P. Find profit earned on selling article Q by shop A, if it allows 35% discount on marked price of Q and Cost price of article P and Q in shop A is same.
 (a) Rs. 135 (b) Rs. 175 (c) Rs. 145 (d) Rs. 165 (e) Rs. 155
41. Shop E made a total profit of Rs 715 on selling article P & Q. If in shop E, selling price of article Q is Rs. 260 less than selling price of article P and cost price of both articles is same, then find discount percent (approximate) offered on article Q by shop E. (Shop E earned profit on both P & Q).
 (a) 38 % (b) 42 % (c) 48 % (d) 46 % (e) 50 %
42. Cost price of article Q is 20% less than that of cost price of article P for shop B, then find profit percentage made by shop B on selling article Q, after allowing a discount of 40% on article Q?
 (a) 10% (b) 15% (c) 25% (d) 50% (e) 5%
43. If profit earned on selling article P by shop D is Rs. 160, then find the total profit earned by all the 5 shops on selling article P. Given that ratio between cost price of article P on respective shops (A, B, C, D & E) is 1 : 2 : 3 : 4 : 5.
 (a) None of the given as option (b) Rs. 840.5 (c) Rs. 880.5 (d) Rs. 890.5 (e) Rs. 820.5

Direction (44 – 48): Bar graph given below shows two successive discounts allowed on four different articles. Read the data carefully and answer the questions.

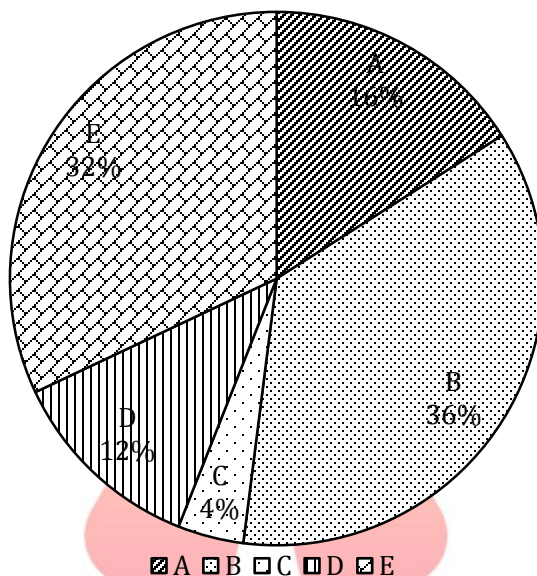


44. If ratio of marked price of P to that of Q is 5 : 6 and difference between selling price of both articles is Rs. 450, then find difference between marked price of article P & Q?
 (a) 360 Rs. (b) 500 Rs. (c) 440 Rs. (d) 400 Rs. (e) 480 Rs.
45. Marked price of S is 25% less than that of P and sum of selling price of both articles is Rs. 2520 and loss on S is 10% & profit on P is 20%. Find ratio of cost price of S to that of P ?
 (a) 1 : 1 (b) 1 : 2 (c) 1 : 3 (d) 2 : 3 (e) 2 : 5
46. If ratio of selling price of Q to that of S is 7 : 4, then find ratio of marked price of S to that of Q?
 (a) 6 : 5 (b) 7 : 5 (c) 5 : 7 (d) 5 : 8 (e) 9 : 5

47. If second discount allowed on P is increased by 25%, then the selling price of article will be decreased by Rs. 90 and selling price of R is Rs. 110 less than that of P, then find marked price of article R?
 (a) 1600 Rs. (b) 1200 Rs. (c) 1800 Rs. (d) 2000 Rs. (e) 2400 Rs.
48. Ratio of selling price of P to that of S is 4 : 3 and sum of marked price of both articles is Rs. 7000. Find difference between selling price of both articles?
 (a) 640 Rs. (b) 840 Rs. (c) 720 Rs. (d) 480 Rs. (e) 240 Rs.

Direction (49 – 53): Given below pie chart shows percentage distributions of total distance covered by five different boats in upstream, while table shows time taken by these 5 boats to cover given distance and ratio of speed of boat in still water to speed of stream while covering the given distance.

Total distance = 25 km



Boats	Time (in minutes)	Ratio of boat in still water to speed of stream
A	30	3 : 1
B	45	4 : 1
C	15	2 : 1
D	30	5 : 2
E	24	6 : 1

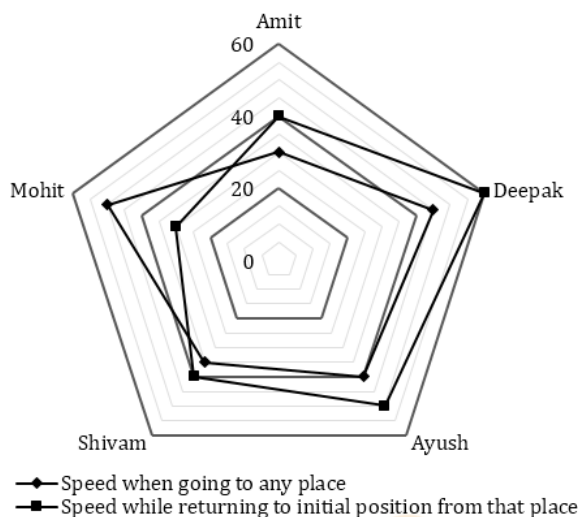
49. Find ratio of time taken by each boat A & C to cover 96 km in downstream?
 (a) 3 : 4 (b) 3 : 5 (c) 2 : 3 (d) 3 : 7 (e) 4 : 5
50. If boat D takes total 20 hours to cover D km each in downstream and in upstream, then find total distance covered by boat D?
 (a) 168 km (b) 164 km (c) 156 km (d) 184 km (e) 180 km
51. Downstream speed of boat E is what percent more than downstream speed of boat B?
 (a) 50% (b) 20% (c) 45% (d) 30% (e) 40%
52. If downstream speed of boat F is 75% more than that of B and ratio of speed of stream for F to speed of boat F in still water is 2 : 5, then find time taken by boat F to cover 120 km in upstream?
 (a) 4 hours (b) 7.5 hours (c) 6 hours (d) 8 hours (e) 10 hours
53. Find difference between downstream speed of boat D and that of boat A?
 (a) 1 km/hr (b) 6 km/hr (c) 2 km/hr (d) None of these (e) 4 km/hr

Directions (54 – 57): Given radar chart shows the speed (in kmph) of 5 persons while going to any place and while returning to their initial position from that place. Read the data carefully and answer the questions.

(NOTE: All start from same position but they might go to same place or different place) (Speed of each person is uniform:

(a) while going to any place and

(b) while returning to their initial position from that place)



54. If total time taken by Amit & Deepak for the entire round trip is same, then total distance travelled by Amit is what percent more/less than total distance travelled by Deepak during the entire round trip?

- (a) $66\frac{2}{3}\%$ (b) 50% (c) 25% (d) $33\frac{1}{3}\%$ (e) 75%

55. What is the difference between average speed of Ayush & Mohit over their entire round trip? (approx.)

- (a) 7 kmph (b) 12 kmph (c) None of these (d) 5 kmph (e) 9 kmph

56. If Ayush & Shivam both start at 7:00 AM to reach city X, which is 280 km away from the starting point and Ayush started returning to the starting point soon after reaching city X then at what approximate time will Ayush & Shivam meet?

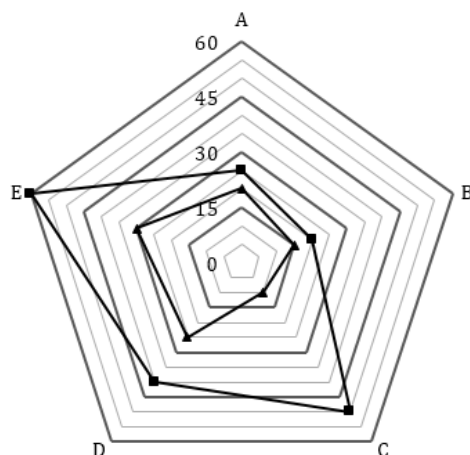
- (a) 2:32 PM (b) 2:25 PM (c) 3:12 PM (d) 3:32 PM (e) 2:36 PM

57. If Deepak & Mohit starts at same time to reach city Y, then what is the ratio of time taken by Deepak to that of by Mohit in reaching city Y?

- (a) 48 : 35 (b) 35 : 48 (c) 9 : 10 (d) Cannot be determined (e) 10 : 9

Direction (58-62): Study the radar chart given below and answer the following questions.

Radar chart shows the markup % and discount % on five different articles sold by a shopkeeper.



Note - 1. Mark up % on any article = $\frac{(\text{Marked price} - \text{cost price}) \text{ of that article}}{\text{Cost price of that article}} \times 100$

2. Discount % on any article = $\frac{(\text{Marked price} - \text{selling price}) \text{ of that article}}{\text{Marked price of that article}} \times 100$

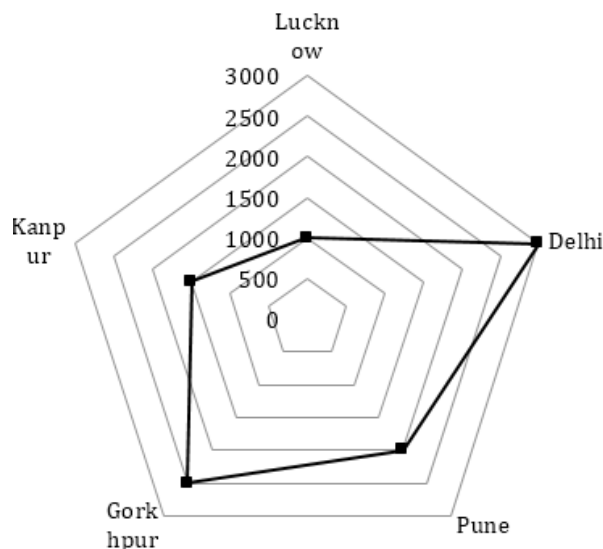
- 58.** If ratio of selling price of A to that of C is 40 : 27, then find marked price of C is what percent of cost price of A?
 (a) 25% (b) 100% (c) 125% (d) 50% (e) 75%
- 59.** If selling price of D is 40% more than marked price of B and selling price of B is Rs.290 less than cost price of D, then find the total profit earned by shopkeeper on selling 1 unit each of B & D?
 (a) Rs.90 (b) Rs.50 (c) Rs.140 (d) Rs.150 (e) Rs.80
- 60.** If shopkeeper earned total profit of Rs.36 on selling A & E, then find amount of discount allowed on E.
 (a) Rs 144 (b) Rs 196 (c) Rs 158
 (d) Cannot be determined (e) None of the above.
- 61.** If selling price of C & E together is Rs.2200 and ratio of cost price of C to selling price of E is 5 : 7, then find difference in marked prices of C & E.
 (a) Rs.250 (b) Rs.450 (c) Rs.300 (d) Rs.400 (e) Rs.350
- 62.** If selling price of A & B together is Rs.2330 and marked price of B is Rs.800 more than that of A, then find cost price of B is what percent of cost price of A?
 (a) 137.5% (b) 150% (c) 162.5% (d) 175% (e) 187.5%

Directions (63-65): Given information represents number of people required for three different projects to be completed in various days.

Project	Case 1		Case 2	
	Number of workers	Days required	Number of workers	Days required
A	X	88	X + 8	66
B	Y	Y-1	Y + 6	Y - 6
C	Z ²	75	M ²	108

- 63.** If in team P, total number of workers= $0.5Z \times 2M$, then what is the number of days required by team P to complete project C?
 (a) 75 days (b) 60 days (c) 90 days (d) 80 days (e) None of these
- 64.** If 64 people were working for Project A, then how many days did it take to complete the work?
 (a) 44 days (b) 22 days (c) 33 days (d) 36 days (e) None of these
- 65.** If 0.5Y people work on Project B for 10 days and then 0.5Y more people joined the project, then how many days will it take to complete the Project B?
 (a) 35 days (b) 40 days (c) 45 days (d) 50 days (e) None of these

Directions (66-70): Radar graph given below shows the distance between Mumbai to five different cities (Lucknow, Delhi, Pune, Gorkhpur & Kanpur) in kilometer and Table given below shows the speed of five different Rajdhani express (A, B, C, D & E) trains in km/hr.

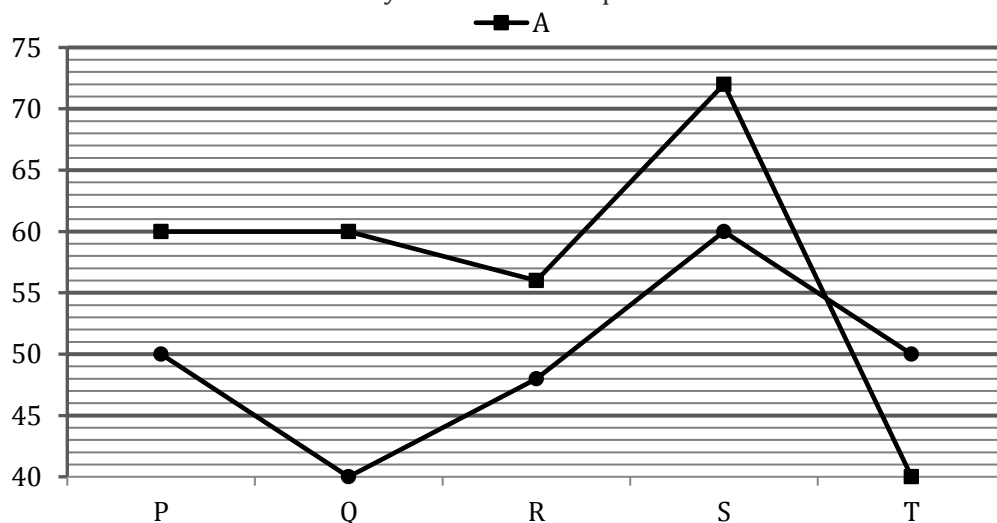


Trains	Speed (in kmph)
A	80
B	—
C	120
D	—
E	150

NOTE: - Some data is missing you have to calculate the missing data according to question.

66. Time taken by train 'A' to travel from Kanpur to Mumbai and then Mumbai to Delhi is equal to the time taken by train C to travel from Mumbai to Lucknow and then Lucknow to Delhi. Find the distance between city Lucknow and city Delhi.
 (a) 5650 km (b) 5750 km (c) 5450 km (d) 5550 km (e) 5320 km
67. Find the approximate time train E takes to reach Kanpur from Lucknow, if Lucknow and city Kanpur is in north and in east direction of Mumbai respectively.
 (a) 12 hours (b) 16 hours (c) 18 hours (d) 10 hours (e) 9 hours
68. Train B and train D start from Mumbai for Delhi and Pune respectively and they reached in equal time. If train B and train D starts from Delhi and Gorkhpur respectively at same time and move towards each other, then time taken by train B to cross train D is what percent of the time taken by train B to reach Delhi from Mumbai. [Distance between Delhi and Gorkhpur is 1500 km].
 (a) 25% (b) 20% (c) 30% (d) 40% (e) 50%
69. A thief stolen money and runs in train D from Mumbai to Kanpur and after six hours of running Mumbai police started to catch him and runs in train C. Due to this thief scare driver of train D so he increases the speed of train D by 100%. If the policeman can catch him at $\frac{3}{5}$ th of the distance of city Kanpur from Mumbai. Find the initial speed of train D.
 (a) $\frac{190}{7}$ km/hr (b) $\frac{349}{7}$ km/hr (c) $\frac{390}{7}$ km/hr (d) $\frac{300}{7}$ km/hr (e) None of the above.
70. Train A and train B start from Mumbai for Lucknow. Train B reaches first at Lucknow and meets train A in between the way, which is 200 km from Lucknow. Find after how much time they will meet second time after first time meeting if both trains continue, their to and fro motion.
 (a) 14 hours (b) 15 hours (c) 16 hours (d) 12 hours (e) 10 hours

Direction (71 – 74): Line graph given below shows percentage of total quantity of milk in five different vessels (P, Q, R, S & T) out of total mixture of milk and water in these vessels for two different milkmen (A & B). Capacity of these five vessels equal for both the milkmen. Read the data carefully and answer the questions.



71. If average of quantity of water in vessel R for both the milkmen is 960 liters and total mixture in vessel P is 40% more than total mixture in vessel R, then find difference between quantity of water in vessel P for both the milkmen?
 (a) 240 l (b) 220 l (c) 320 l (d) 280 l (e) 300 l

72. If ratio between capacity of vessel P to vessel T is 2: 3 and difference between total quantity of milk in vessel P and vessel T for both the milkmen is 180 liters, then find the difference between total quantity of water in vessel P and T for both the milkmen?
 (a) 540 l (b) 520 l (c) 548 l (d) 480 l (e) 524 l
73. which option required to find difference between capacity of vessel S and T?
 (a) Difference between milk in vessel S of A and water in vessel T of B is 320 l.
 (b) difference between water in vessel S of B and milk in vessel T of A is 200 l
 (c) none of these
 (d) Ratio of capacity of S & T is 3: 2 and difference between water in vessel S of B and milk in vessel T of A is 200 l.
 (e) Either (b) or (d)
74. If some quantity of mixture sold by A to B from the vessel Q but instead of mixture A cheat B and he sold only water to B, then find the quantity of mixture sold by A to B.
 I. Mixture sold by A to B from vessel Q is 62.5% less than total milk in vessel Q for B, while difference between total quantity of milk in vessel Q for both milkmen is 400 l.
 II. A sold 37.5% of its total water from vessel Q to B, while difference between total quantity of milk in vessel Q for both the milkmen is 400 l.
 (a) Statement (I) alone is sufficient to answer the question but statement (II) alone is not sufficient to answer the questions.
 (b) Statement (II) alone is sufficient to answer the question but statement (I) alone is not sufficient to answer the question.
 (c) Both the statements taken together are necessary to answer the questions, but neither of the statements alone is sufficient to answer the question.
 (d) Either statement (I) or statement (II) is sufficient to answer the question.
 (e) Statements (I) and (II) together are not sufficient to answer the question.

Directions (75-79): Given below is the table which shows five different schemes and rate of simple interest (S.I.) and rate of compound interest (C.I.) offered on these schemes.

Note : All the interest is calculated annually.

SCHEME	S.I.	C.I.
A	—	8%
B	12%	—
C	—	40%
D	15%	—
E	10%	20%

75. If a sum is invested in scheme B at C.I, then amount obtained after 2 year from this scheme is 1.44 times the sum invested. Rate of simple interest for scheme A is half of the rate of compound interest for scheme B. Find out the interest earned when 8000 was invested for 2 years in Scheme A at S.I and in Scheme B at C.I for 2 years.
 (a) 5120 (b) 5000 (c) 4800
 (d) Can't be determined (e) None of these
76. A man invested 10,000 in scheme D at S.I. for 6 years, the interest he obtained is divided into equal halves and invested in two different schemes i.e. scheme B and scheme C for 4 year each at S.I. If the ratio of interest obtained in both scheme is 3 : 2, then find out the rate of interest in C scheme.
 (a) 10% (b) 8% (c) 11% (d) 5% (e) None of these
77. A sum is invested in scheme E at S.I. for 2 year and then whole amount obtained is invested at C.I. in same scheme for 2 more years. If same sum would have been invested in scheme D for 4 year with S.I. then, what would have been the ration of amount obtained from scheme E to the amount obtained from scheme D.
 (a) 27 : 25 (b) 21 : 23 (c) 40 : 49
 (d) Can't be determined (e) None of these
78. A man invests equal sum in two different schemes, D and E at S.I. for 4 year each. The total interest he got is invested in the scheme A for 3 year at C.I. Due to some reason instead of getting interest from scheme A, the scheme is flopped and sum invested in scheme A is depreciated each year with same rate, and he got Rs. 778688 after 3 year. Find the amount he invested in both scheme initially.
 (a) 30,00,000 (b) 40,00,000 (c) 20,00,000 (d) 10,00,000 (e) None of these

79. A sum is invested in scheme C for 5 years at S.I. and then the amount received from it is invested in same scheme for 2 years at C.I. Total amount received after 7 years is 194% more than the sum invested initially. Find out the rate of interest in scheme C for S.I.

- (a) 10% (b) 12.5% (c) 15% (d) 5% (e) None of these

Directions (80-83): Data show the different kind of solids in a toy shop. Shopkeeper or (toymaker) makes different types of toys by joining these solids. Some values are missing, you have to calculate these values if required to answer the question.

	Diameter	Length	Breadth	Height
Cylinder	–	–	–	12
Cube	–	–	–	–
Cuboid	–	24	–	10
Cone	14	–	–	–
Sphere	21	–	–	–
Hemisphere	–	–	–	–

80. A toymaker makes a toy in which a cone is mounted on the base of a hemisphere. If the total surface area of the toy is 858 cm^2 then find the volume of the toy?

- (a) $1950\frac{2}{3} \text{ cm}^2$ (b) $1250\frac{2}{3} \text{ cm}^2$ (c) 1400 cm^2 (d) 1500 cm^2 (e) None of these

81. Toymaker mounted the cube on the cylinder such that cylinder top is exactly in the middle of the face of the cube. Find the total surface of the toy formed, if the height of formed toy is twice the height of cylinder and curved surface area of cylinder is 66 times the height of cylinder

- (a) 3125 cm^2 (b) 2794.5 cm^2 (c) 4112 cm^2 (d) 5123 cm^2 (e) None of these

82. If given sphere is cut into two hemisphere and these hemispheres are mounted on both ends of the cylinder, then find out the ratio of volumes of toy formed by joining both hemispheres on cylinder, cylinder and sphere.

- (a) 7 : 6 : 13 (b) 6 : 13 : 7 (c) 13 : 6 : 7 (d) 13 : 7 : 6 (e) None of these

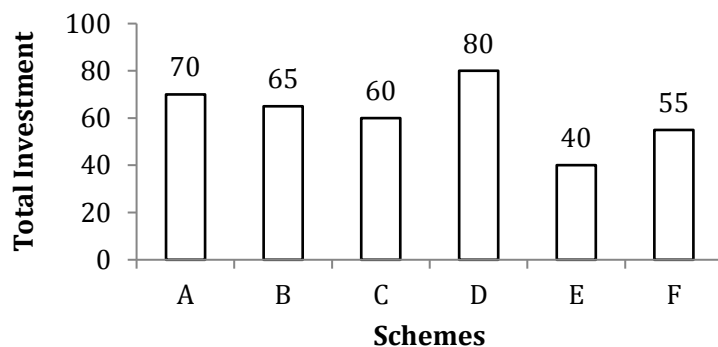
83. Volume of the cuboid is approximately what percent more or less than the volume of cone if slant height of cone is 25 cm and the breadth of the cuboid is 25% of the height of cone.

- (a) 7% (b) 11% (c) 14% (d) 17% (e) 21%

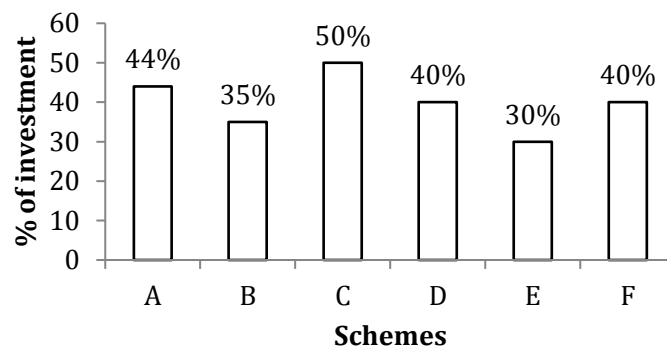
Directions (84-86): Study the following bar graph carefully and answer the following question

Total investment (in thousand) of Abhimanyu and Gaurav in 6 different schemes (A, B, C, D, E, F) and percentage of Abhimanyu share in total investment

Total investment (in thousand) of Abhimanyu and Gaurav in 6 different schemes (A, B, C, D, E, F)



Percentage of Abhimanyu's share in the total investment made in 6 different schemes

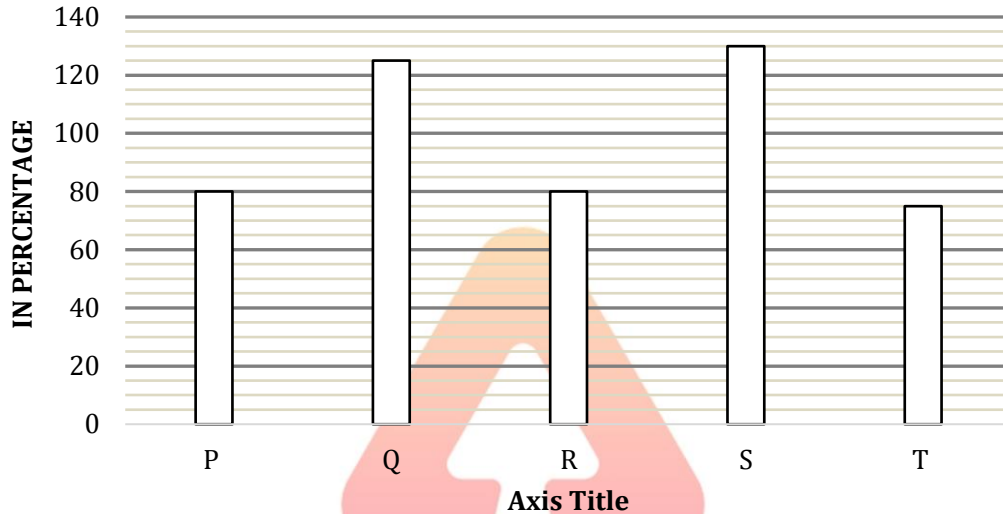


84. If Scheme A offers simple interest of R% percent per annum and share of interest earned by Abhimanyu in scheme A is 1100 then find the value of R% if investment is made for 2 year.

- (a) $\frac{25}{14} \%$ (b) 20% (c) $18\frac{2}{3} \%$ (d) $13\frac{1}{3} \%$ (e) None of these

85. Average of investment made by Abhimanyu in scheme B and C together is what % more or less than average of investment made by Gaurav in scheme A and F together (Approximately)
 (a) 22% (b) 18% (c) 24% (d) 37% (e) 27%
86. If scheme B and C offers simple interest at the rate of 10% and $\frac{100}{3}\%$ respectively. Then find the total interest obtained from scheme B and C in 3 years. Gaurav invested in scheme B for 2 years and Abhimanyu invested in Schemes C for 2 years.
 (a) 45275 (b) 43340 (c) 38270 (d) 32350 (e) None of these

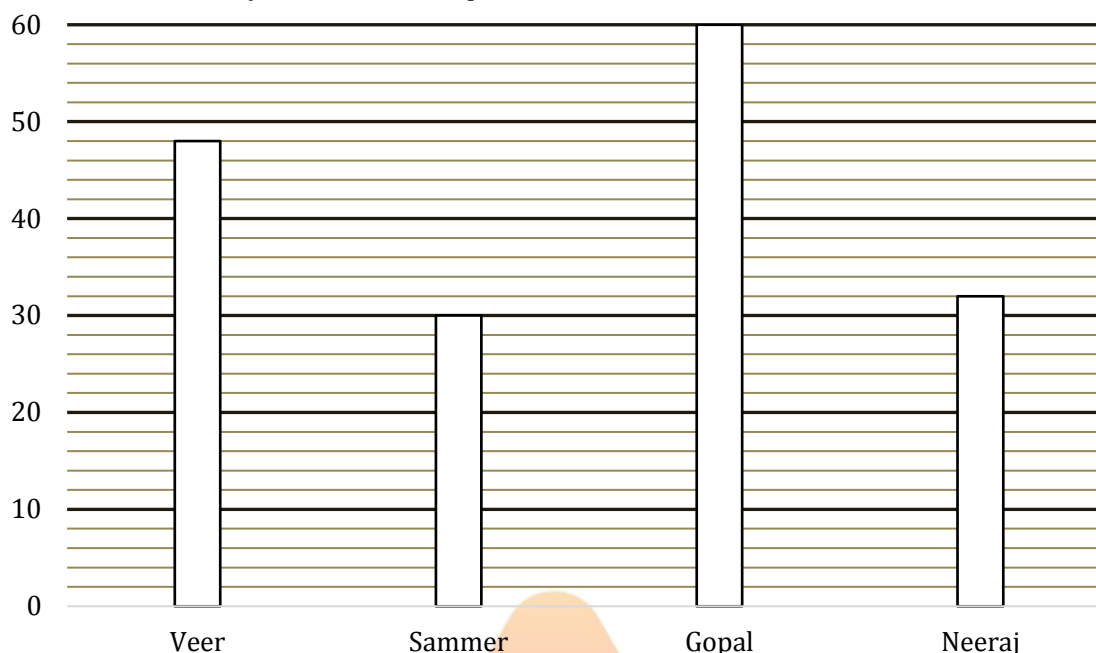
Direction (87 – 89): There are ten vessels P, Q, R, S, T, A, B, C, D & E. Bar shows graph total milk in P, Q, R, S & T as a percent of total milk in A, B, C, D, & E respectively. Table below shows ratio of total water in P, Q, R, S & T to total water in A, B, C, D, & E respectively. Read the data carefully and answer the questions.



Vessels	Ratio of water in vessel
P : A	7 : 5
Q : B	1 : 2
R : C	3 : 5
S : D	3 : 4
T : E	1 : 5

87. Milk in A is double of water. 60% of mixture from P and 80% of mixture from A are taken out, so that average cost of this resulting mixture become 40 Rs./litre. and average cost of milk in resulting mixture 50 Rs./litre. If the difference between total cost of resulting mixture and total cost of resulting milk is 2000 Rs., then find the difference between qmilk & water in resulting mixture (Cost of water also included)?
 (a) 48 liters (b) 56 liters (c) 54 liters (d) 46 liters (e) 84 liters
88. Milk in Q is 120% more than that of water in that vessel and difference between water in B and Q is 2000 liters. If water in D is 800 liters less than milk in Q and ratio of milk and water in D is 16 : 9, then find milk in S (in liters)?
 (a) 8320 (b) 8120 (c) 8430 (d) 8350 (e) 8310
89. Total mixture in R is 72% of total mixture in C. Mixtures from R & C are mixed in the ratio of 3 : 4 and from this resulting mixture, $16\frac{2}{3}\%$ is replaced with same quantity of water. If again 10% of resulting mixture is replaced with same quantity of water, then find the ratio of milk to water in resulting mixture?
 (a) 33 : 43 (b) 33 : 41 (c) 33 : 31 (d) 33 : 35 (e) 33 : 37

Direction (90 – 93): Bar graph given below shows number of days taken by four people to complete a piece of work individually. Read the data carefully and answer the questions below.



Note – Given below three different range of efficiency of persons.

Efficiency A – 80% – 100%

Efficiency B – 60% – 80%

Efficiency C – 40% – 60%

Three persons also operate on three different levels.

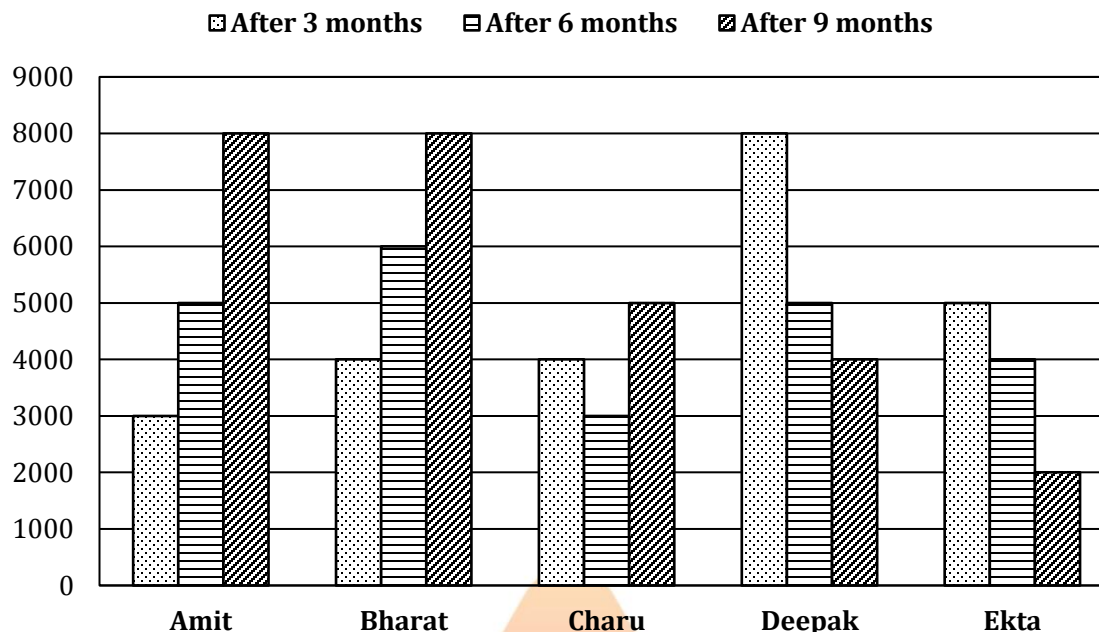
Level 1 – take above range of efficiency

Level 2 – take mid-range of efficiency

Level 3 – take lower range of efficiency

- 90.** Veer & Sameer start work together with level 2 & level 1 of efficiency A respectively and after 'd' days Neeraj replaced both and did remaining work with level 3 of efficiency C in $(d - \frac{8}{3})$ days. If Gopal work for '2.5d' days with level 3 of efficiency B, then find what portion work will be completed by Gopal?
- (a) $\frac{2}{3}$ rd (b) $\frac{2}{7}$ th (c) $\frac{2}{5}$ th (d) $\frac{2}{11}$ th (e) $\frac{2}{9}$ th
- 91.** Ayush and Neeraj start work together with level 3 & level 2 of efficiency A and efficiency C respectively. After 30 days Ayush and Neeraj left the work and remaining work complete by Veer with level 2 of efficiency B in 15 days. If Ayush & Gopal work together with level 1 of efficiency A, then find percentage of remaining work after 33 days?
- (a) $1\frac{1}{32}\%$ (b) $2\frac{1}{32}\%$ (c) $4\frac{1}{32}\%$ (d) $6\frac{1}{32}\%$ (e) $8\frac{1}{32}\%$
- 92.** Veer work for 'x' days with level 2 of efficiency B & remaining work complete by Sameer in 'y' days with level 2 of efficiency C. If Gopal work for 'x' days with level 2 of efficiency A and remaining work complete by Neeraj in 'y' days with 2.4% more efficient than level 2 of efficiency C, then find in how many days remaining work complete by Neeraj with his usual efficiency, if first Gopal work for (x + y) days with level 2 of efficiency C?
- (a) $14\frac{2}{7}$ days (b) 6 days (c) 12 days (d) $14\frac{2}{3}$ days (e) $16\frac{2}{3}$ days
- 93.** All four starts work together, Veer work with level 3 of efficiency C, Sameer work with level 2 of efficiency C, Gopal work with level 1 of efficiency A and Neeraj work with level 3 of efficiency A. If for the whole work total wage of Rs. 20000 distributed among these four, then find the difference between wage of Veer and Neeraj?
- (a) 5000 Rs. (b) 4000 Rs. (c) 4500 Rs. (d) 4800 Rs. (e) 5600 Rs.

Directions (94- 98): Bar graph given below shows additional amount invested by different investors after 3 months, six months and 9 months of investment. Study the data carefully and answer the following questions.



Note: - For example: -

Initial investment of Amit = 5,000

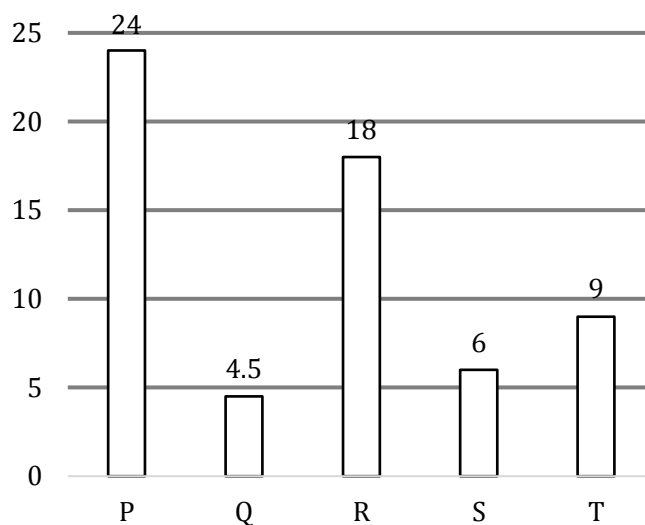
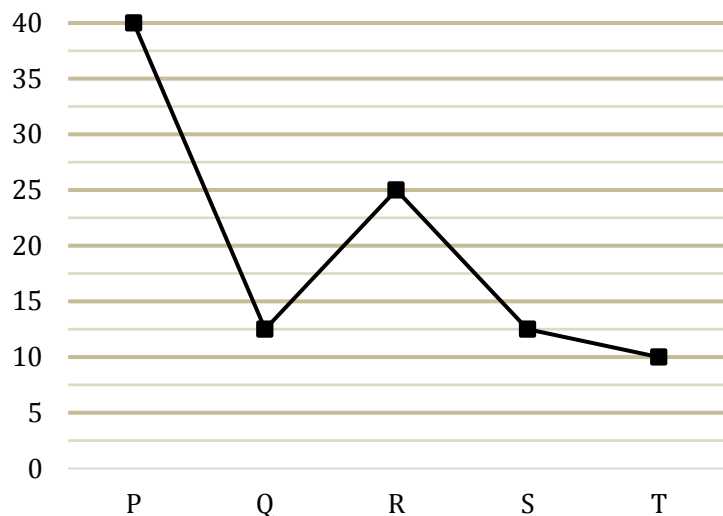
Investment of Amit after 3 months = 5000+3000 = 8000

Investment of Amit after 6 months = 8000+5000 = 13000

Investment of Amit after 9 months = 13000+8000 = 21000

- 94.** Amit and Charu started a business together. 'Charu' worked for 10 months & left the business and 'Amit' worked for 12 months. Amit's initial investment is 50% more than Charu's initial investment. If Amit got Rs.3120 more profit than 'Charu', then find Charu's profit out of total profit.
 (a) 3900 (b) 7020 (c) 4200 (d) 7320 (e) Cannot determined
- 95.** Bharat and Deepak both invested for six months in a business. Initial investment of both Bharat and Deepak is same. If out of total profit of Rs 41,250 Bharat got Rs 18,750, then find initial investment of Deepak ?
 (a) 4000 (b) 6000 (c) 8000 (d) 10000 (e) 12000
- 96.** If Amit and Bharat's initial investment is Rs 12000 and Rs 10000 respectively then find Bharat's share in profit is what percent less than Amit's share in profit, if both invested for 12 months?
 (a) $4\frac{1}{6}\%$ (b) 4% (c) $3\frac{1}{3}\%$ (d) 3% (e) $5\frac{1}{3}\%$
- 97.** Charu and Deepak started a business together. Charu invested for 10 months while Deepak invested for 9 months. If ratio between Charu's and Deepak's initial invested is 9 : 20 and ratio between profit share of Charu to total profit is 5 : 14, then find the total investment Deepak after 6 months of starting of business?
 (a) 20,000 (b) 28,000 (c) 23,000 (d) 33,000 (e) 35,000
- 98.** Bharat and Ekta started a business together. 'Bharat' invested for 11 months while 'Ekta' invested for 12 months. Out of total profit 20% is given to 'Bharat' as an active partner and remaining is distributed between 'Bharat' and 'Ekta' according to their investments. At last profit share of Bharat and Ekta is equal. If initial investment of 'Bharat' is Rs. 6,000, then find initial investment of 'Ekta'?
 (a) Rs. 9,750 (b) Rs. 11,250 (c) Rs. 13,750
 (d) Rs. 12,500 (e) Cannot be determined

Direction (99 –103): Line graph given below shows percentage of a tank filled by each pipe and bar graph shows hours taken by each pipe to do fill that part of tank.



- 99.** Pipe P and pipe T start filling the tank together and fill it for 't' hours after that both pipes replaced by R and S, who fill for next (t + 2) hours and $\frac{50}{9}\%$ of total tank still unfilled. If pipe A can fill with the efficiency of (t + 2) unit/hours, then find the time taken by pipe A to fill tank alone?
 (a) 36 hours (b) 24 hours (c) 30 hours (d) 39 hours (e) 45 hours
- 100.** Pipe Q and T start filling tank alternatively starting with pipe Q and fill the tank for 25 hours, after that both are pipe replaced by pipe P and R and both pipe start filling alternatively starting with pipe R. Find in how much time remaining tank will be filled?
 (a) $28\frac{1}{6}$ hours (b) $33\frac{1}{6}$ hours (c) $46\frac{1}{3}$ hours (d) $38\frac{1}{6}$ hours (e) $42\frac{1}{3}$ hours
- 101.** Pipe P and S start filling the tank together and fill it for y hours, after that pipe Q fill for (y – 4) hours and remaining tank filled by pipe T in (y – 10) hours. If all four pipes P, Q, S & T for (y – 3) hours together, then what portion of tank will be unfilled?
 (a) $\frac{1}{36}$ (b) $\frac{1}{124}$ (c) $\frac{1}{128}$ (d) $\frac{1}{144}$ (e) $\frac{1}{148}$
- 102.** If for first 15 hours pipe P start filling with its 25% less efficiency and pipe S fill the tank with $33\frac{1}{3}\%$ more its efficiency together and remaining tank filled by another pipe B in 57 hours. Find in how much time pipe B can fill the tank alone?
 (a) 102 hours (b) 128 hours (c) 108 hours (d) 144 hours (e) 162 hours
- 103.** Five pipes P and T, Q and R and S work alternatively in such a manner that on first hour P and T fill together, on second hour Q and R fill together and third hour S fill alone, find in how much time whole tank will be filled?
 (a) $54\frac{3}{4}$ hours (b) $33\frac{1}{4}$ hours (c) $22\frac{1}{2}$ hours (d) $36\frac{1}{4}$ hours (e) $42\frac{3}{4}$ hours

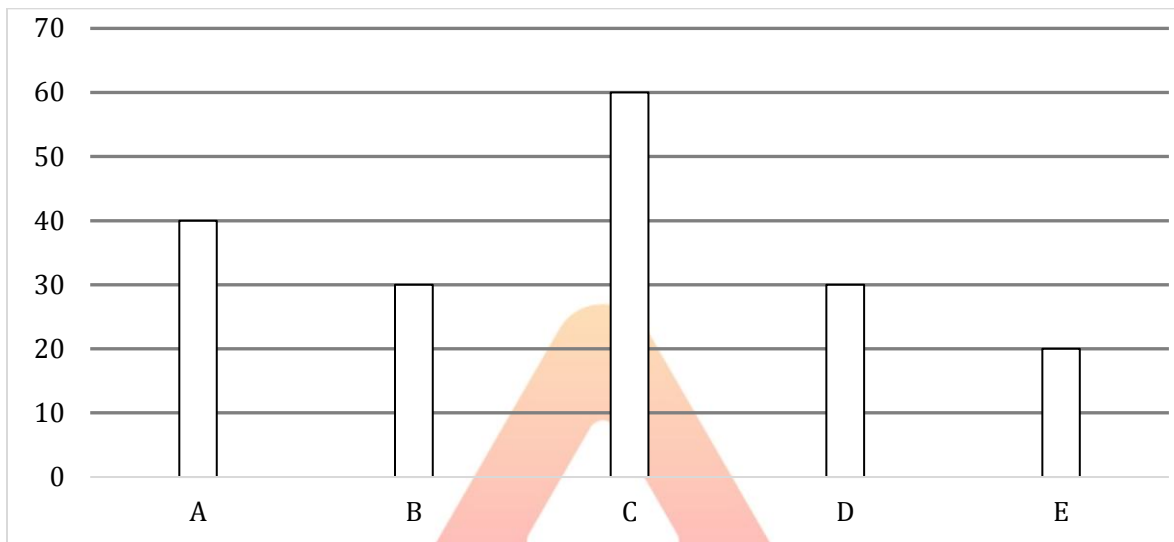
Direction (104–106): The following table shows the time taken by four different persons (in hours) to do four different tasks. No tasks can be done at a time by two different persons.

Task Person	W ₁	W ₂	W ₃	W ₄
A	6	7	8	4
B	3	8	5	7
C	7	7	6	2
D	5	6	5	8

- 104.** What is the minimum time in which all the tasks can be completed if task is done one after the other in the order of W₃, W₁, W₂ and W₄ and each person can do any one of the task in a day?
 (a) 16 h (b) 15 h (c) 17 h (d) 18 h (e) 19 h

- 105.** If on a particular day, A is absent then what is the minimum time required to finish all the tasks, if tasks can be done simultaneously.
 (a) 10 h (b) 8 h (c) 12 h (d) 9 h (e) 11 h
- 106.** If only two persons work on a particular day, then find the minimum time required to complete all the tasks, if the tasks can be done simultaneously?
 (a) 10 h (b) 12 h (c) 11 h (d) 8 h (e) 9 h

Direction (107 – 111): Bar graph given below shows time (in hours) taken by five different pipes to fill a tank 'T' alone. Ratio of efficiency of all five pipes remain same throughout any situation. Study the data carefully and answer the following questions.



- 107.** All five-pipe start filling another tank 'X' together and E closed after 8 hours. Tank filled by B is same as tank filled by C, while A and C fill the tank for same time. D fill the tank for 'p' hours. If B, C & D together can fill the tank 'X' in 24 hours and B fill the tank for only 10 hours, then find the value of 'p'.
 (a) 7 hours (b) 9 hours (c) 11 hours (d) 13 hours (e) 15 hours
- 108.** A and C together can fill another tank 'P' in $(T + 42)$ hours, while B and D together can fill the tank 'P' in $(T + 15)$ hours. Find how many hours B fill the tank 'P'.
 (a) 100 hours (b) 90 hours (c) 85 hours (d) 50 hours (e) 60 hours
- 109.** All five pipes started together to fill another tank M. E fill the tank for 6 hours and then closed. After 3 hours more both B and D closed too. 40% of total tank is filled by A and C together but after 'x' more hours 'A' left. Remaining tank is completed by 'C' in 'd' more hours. If $d - x = 3$, then number of hours for which 'C' fill the tank is what percent more than number of hours for which 'A' fill the tank.
 (a) $33\frac{1}{3}\%$ (b) 50% (c) $66\frac{2}{3}\%$ (d) 75% (e) 100%
- 110.** A, B and C together starts to fill tank 'T'. After seven hours 'C' closed and after three hours more 'A' and 'B' also closed. If remaining tank is filled by D and E alternatively in 'd' hours. If 'd' is integer, then find 'E' filled for how many hours?
 (a) 3 hours (b) 4 hours (c) 5 hours
 (d) 6 hours (e) Cannot be determined
- 111.** A, B and D together started filling tank 'T'. After five hours, B and D replaced by C and E and after five more hours A also close. After one more hour E close too. C fill the tank for total 't' hours. In other case A and B starts filling together to tank 'T'. After four hours both pipes are replaced by E. If E fill the tank for five hours and replaced by D who fill the tank for eight hours. Remaining tank filled by C in 'd' hours. Find $(d - t)$?
 (a) 4 hours (b) 10 hours (c) 6 hours (d) 8 hours (e) 12 hours

Direction (112 – 116): Given below line graph which shows number of days taken by six persons A, B, C, D, E and F to complete a work individually. Give answer of the questions according to graph and data given in questions —



- 112.** A worked for X days and then he left the work. After A left, B & D took responsibility of the work and completed the remaining work in $(x + 2\frac{1}{2})$ days. Ratio of work done by A to B & D together is 1 : 2. Find how many days A worked?
 (a) 7 days (b) 5 days (c) 8 days (d) 4 days (e) 9 days
- 113.** A and D starts working together, but A worked with 50% of his efficiency. C starts working with $66\frac{2}{3}\%$ more of his efficiency on an another work which is $62\frac{1}{2}\%$ of the work which A and D were doing. Find the ratio of days taken by C to days taken by A and D together to complete the work?
 (a) 5:3 (b) 5:7 (c) 3:5 (d) 3:7 (e) 3 : 11
- 114.** D started the work and left it after working for X days and then C joined the work and worked for Y days. After C left, E completed the remaining work in 3 days. Find number of days for which D and C worked individually, given that value of Y is 200% of value of X ?
 (a) 6 days & 12 days (b) 8 days & 16 days (c) 7 days & 14 days
 (d) 9 days & 18 days (e) 5 days & 10 days
- 115.** Three persons C, D and E starts working on alternative day, starting from C then D and at last E. If C works with $66\frac{2}{3}\%$ more efficiently, D works with 75% of his efficiency and E works with half of his efficiency, then find in how many days total work completed?
 (a) $20\frac{8}{9}$ days (b) $21\frac{7}{9}$ days (c) $20\frac{7}{9}$ days (d) $22\frac{7}{9}$ days (e) $24\frac{7}{9}$ days
- 116.** Three persons B, D and F starts working together. If B works with 75% of his efficiency and D worked 25% more efficiently. All three get 27180 Rs. as total wages. Find the individually wage of all according to work done by them (in Rs.)?
 (a) 6795, 6795 & 13590 (b) 7695, 7695, & 13590 (c) 6595, 6595, & 14590 (d) 7965, 6795, & 12590 (e) None of these

Directions (117-121): Given below the table shows types of interest offered by five banks, principal amount, time of period and rate of interest. Some of the data is missing. Calculate that according to information given in questions.

Bank	Type of interest	Principle (Rs)	Time (year)	Rate	Amount(Rs)
ICICI	Compound	--	--	15%	--
SBI	Simple	--	4	--	26250
YES	Compound	20000	3	10%	--
UCO	Compound	--	2	--	29160
IDBI	Simple	10000	--	6%	-

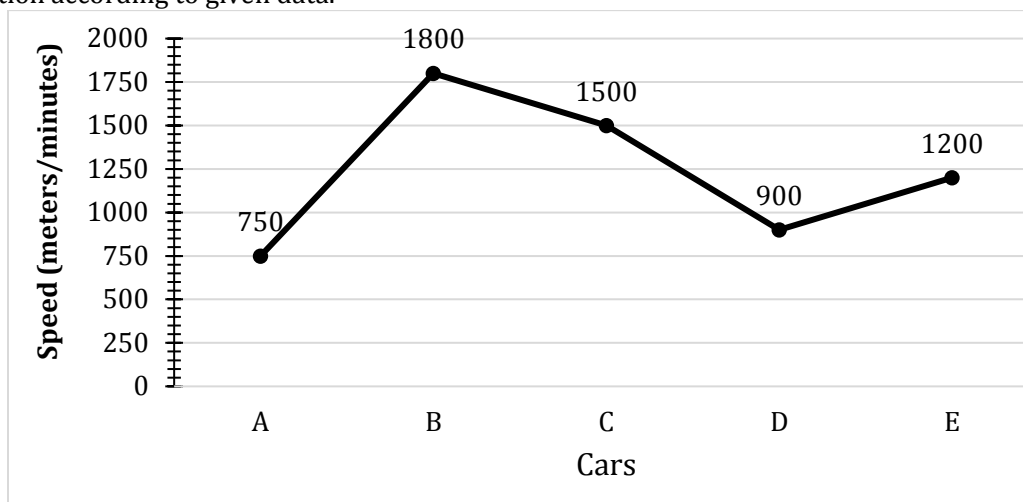
- 117.** If the ratio of interest rate of IDBI to that of UCO is 3 : 4, then find the difference between principle invested in UCO bank and amount obtained from IDBI, if time period for both banks is same?
 (a) 13800 Rs (b) 12800 Rs (c) 11800 Rs (d) 13600 Rs (e) 13900 Rs.
- 118.** If rate of interest offered by SBI and Yes bank is same. Then find principle invested in SBI is approximately what percent of amount obtained from YES bank?
 (a) 52% (b) 59% (c) 70% (d) 65% (e) 78%
- 119.** What is amount of interest obtained from ICICI bank, if ratio of principle invested in ICICI bank to principal invested in Yes bank is 7 : 5 and time period is one year less for ICICI bank than time period of YES bank?
 (a) 9020 Rs (b) 9030 Rs (c) 8030 Rs (d) 7030 Rs (e) 9080 Rs.
- 120.** Principle invested in ICICI is 3000 more than principle invested in UCO bank and both invested for same period of time and UCO bank offered 8% rate of interest annually. If amount obtained from ICICI is Rs. 32870 more than interest obtained from UCO bank then find the principle invested in UCO bank and ICICI bank?
 (a) Rs 25000 & Rs 27000 (b) Rs 18000 & Rs 16000 (c) Rs 22000 & Rs 20000
 (d) Rs 25000 & Rs 28000 (e) Rs 24000 & Rs. 28000
- 121.** If ratio between rate of interest offered by SBI bank to IDBI bank is 5 : 3 and ratio between time period is 2 : 1 respectively, then find the sum of principle invested in SBI bank and amount obtained from IDBI bank?
 (a) 27850 Rs (b) 28850 Rs (c) 29950 Rs (d) 27950 Rs (e) 31950 Rs.

Directions (122–126): Table given below shows length of six train, speed of train (meters/minutes), time taken by different trains to cross different platform and length of each platform is also given. Some of the data in table is missing, calculate the missing data and answer the questions according to condition given in questions.

Train	Length of train(m)	Speed (meters/minutes)	Time taken by train to cross platform (sec)	Length of platform(m)
A	---	750	24	---
B	180	---	21.6	---
C	---	2000/3	---	---
D	120	---	---	240
E	300	---	30	---
F	---	1000	---	---

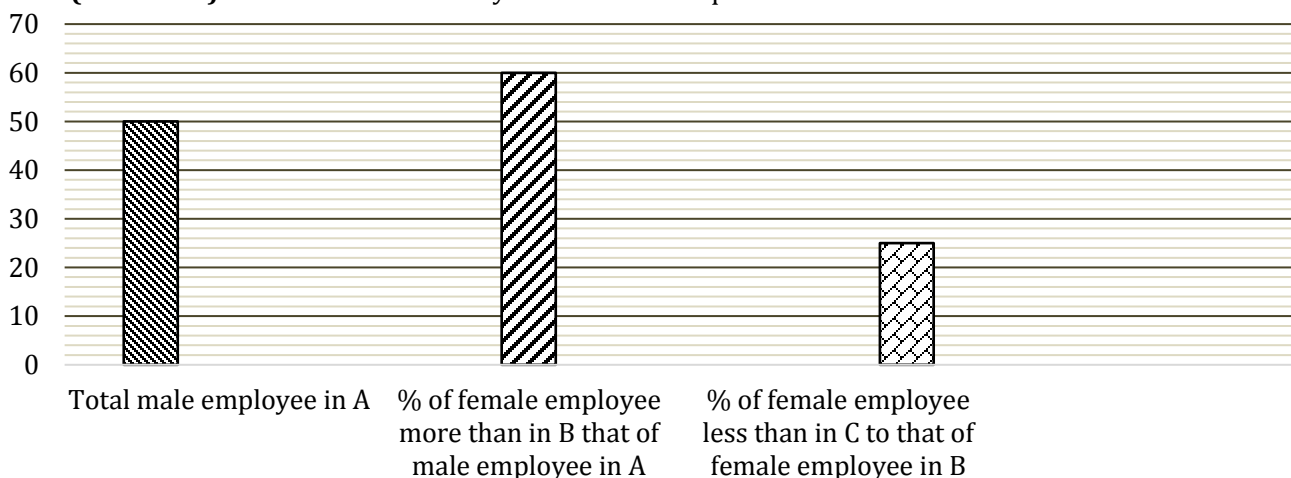
- 122.** Train A running at its average speed crossed the platform and it takes $9\frac{9}{11}$ sec to pass a man who is walking at 10 km/hr in the opposite direction to that of train A. Find the length of platform?
 (a) 300 m (b) 150 m (c) 180 m (d) 200 m (e) 225 m
- 123.** Ratio of length of train C to train F is 3 : 5. If running in opposite direction, both train crossed each other in 14.4 sec. then find time taken by train C in crossing a platform which is 50m more than length of train of C. Also find length of train F?
 (a) 53/2 sec, 250m (b) 60/7 sec, 200m (c) 63/2 sec, 250m (d) 43/2 sec, 180m (e) 49/2 sec, 225 m
- 124.** If train B and E crossed their respective platforms and platform lengths are same as their respective train. Then find in what time faster train crossed slower train if they are running in same direction?
 (a) 144 sec (b) 134 sec (c) 140 sec (d) 240 sec (e) 225 sec
- 125.** Ratio of magnitude of time taken by train D in crossing the respective platform to speed of train D (m/s) is 5 : 8. Then find ratio of time taken by train D to train F in crossing a platform whose length is 600 m? (Ratio of length of train D to that of train F is 3:5)
 (a) 5 : 8 (b) 5 : 6 (c) 7 : 5 (d) 2 : 5 (e) 5 : 3
- 126.** Two train B and D moving in same direction, if speed of smaller train is 54 km/hr and faster train crossed a man, who sits in smaller train in 24 sec. Then find the speed of faster train in meters/sec?
 (a) 35/2 sec (b) 45/2 sec (c) 33/2 sec (d) 43/2 sec (e) 41/2 sec

Directions (127-131): Line graph shows usual average speed of five cars A, B, C, D and E. Speed is given in meter/minute. Answer the question according to given data.



- 127.** Car D started from Lucknow to Delhi at its usual speed for first half distance, but after that due to some problem in engine car travel at $\frac{4}{6}$ of its usual speed. If car completed whole journey in 10 hr, then find the total distance between Lucknow and Delhi?
 (a) 440 km (b) 432 km (c) 442 km (d) 450 km (e) 452 km
- 128.** Car C starts from Pune and at the same time Car A starts from Mumbai towards each other, and at the time both meet one car has traveled 180 km more than other car. Find the distance between Pune and Mumbai?
 (a) 540 km (b) 520 km (c) 500 km (d) 520 km (e) 640 km
- 129.** Rajeev go to his village from the city by car B and return by car C. If his total travelling time is of 11 hours, then find the distance between city and his village?
 (a) 500 km (b) 510 km (c) 520 km (d) 540 km (e) 1080 km
- 130.** Car E travels at its usual speed between city X and Y and take 480 minutes to complete total distance. But at the time of returning car E decreases its speed by 12 km/hr. Then find time taken by car E (in minutes) returning from city Y to X?
 (a) 526 minutes (b) 530 minutes (c) 576 minutes (d) 550 minutes (e) 612 minutes
- 131.** The distance between Delhi and Gorakhpur is 762 km. Car E starts at 4 pm from Delhi towards Gorakhpur at a given speed. Another car C starts at 3.20 pm from Gorakhpur towards Delhi at a given speed. How far from Delhi both cars meet and at what time?
 (a) 8:20 pm, 312 km (b) 7:20 pm, 290 km (c) 8:10 pm, 390 km
 (d) 6:20 pm, 350 km (e) 9:20 pm, 480 km

Directions (132 - 133): Read the data carefully and answer the questions.



NOTE:

There are three companies A, B & C.

Total employee in each company = Total male employee + Total female employee

- (i) probability of selecting a male employee from company A is $\frac{5}{12}$.
 (ii) when a male employee is selected from all three companies, the probability of him being either from company B or company C is $\frac{14}{19}$.
 (iii) probability of selecting a male employee from company B is equal to probability of selecting a male employee from company C.

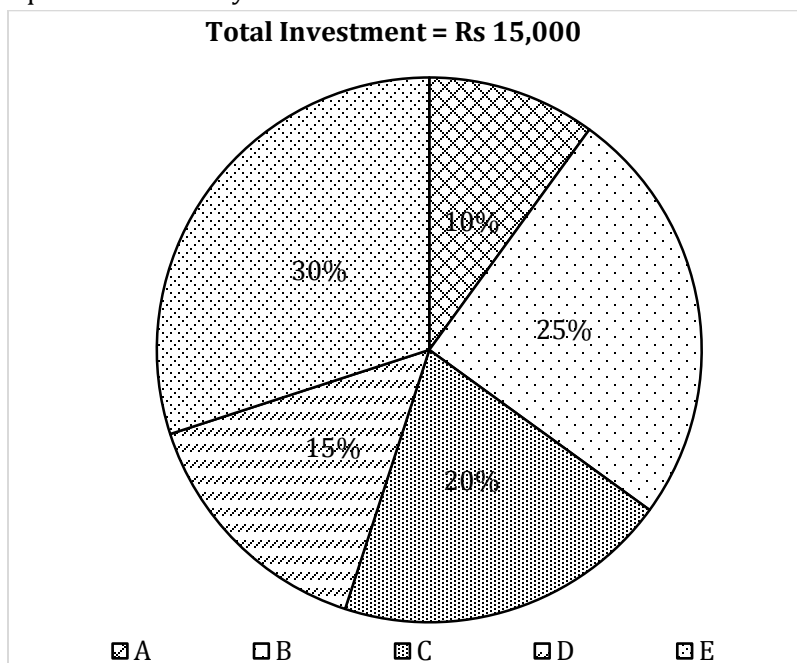
132. How many male employees are there in company C?

- (a) 60 (b) 50 (c) 70 (d) 80 (e) 90

133. By what percent total employee in B are more than that of in company A?

- (a) $16\frac{2}{3}\%$ (b) $37\frac{1}{2}\%$ (c) 25% (d) $33\frac{1}{3}\%$ (e) None of these

Directions (134-136): Pie chart given below shows investment (in terms of percentage) out of total investment of five different persons. Study the questions carefully and answer them.



134. A and C entered into a business. After four months A withdraws Rs 800 and after six months C added Rs 1200 more. Profit obtained at the end of year by C is Rs 2700 and profit obtained by A Rs. ____?

- (a) 1225 (b) 1000 (c) 825 (d) 725 (e) 650

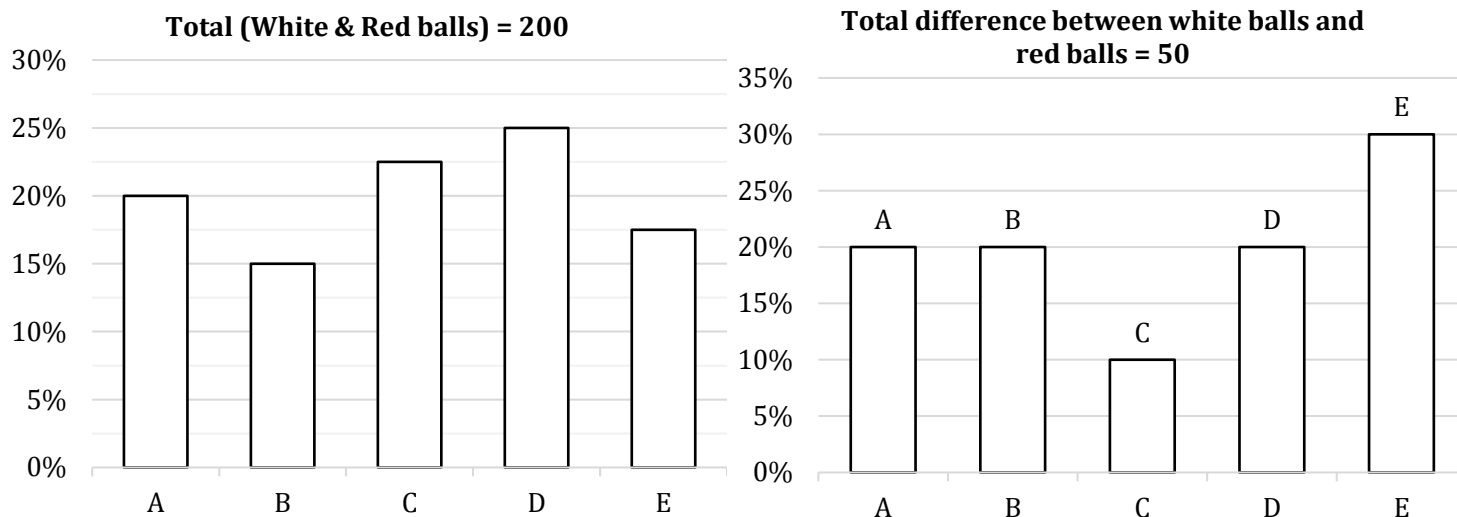
135. E, B and F started a business together. F invested Rs 500 more than the amount invested by E and E left the business after six months. If after eight months B also left the business and total profit at end of year obtained by E and F together is Rs 2900, then find total profit?

- (a) Rs 3900 (b) Rs 3700 (c) Rs 4200 (d) None of these (e) Rs 4700

136. Three business partner D, X and Y invested in ratio 3 : x : 5 and for time which they invested are in ratio 4 : 3 : 2 respectively. If the total profit of D and Y is Rs 6600 out of total profit of Rs 9300, then find amount invested by X?

- (a) Rs 2520 (b) Rs 2250 (c) Rs 3200 (d) None of these (e) Rs 1250

Direction (137 – 140): Bar graph (I) shows percentage distribution of total number of white balls and red balls in five different bags and bar graph (II) shows percentage distribution of total difference between number of white balls and red balls in these five bags. Read the data carefully and answer the questions.



Note – Each bag contains only two colors balls (white and red)

- 137.** When one ball from each bag A & C chosen randomly, then probability of both the balls being white is _____ (white balls more than red balls, in both the bags)?
 (a) $\frac{35}{72}$ (b) $\frac{5}{9}$ (c) $\frac{25}{84}$ (d) $\frac{25}{72}$ (e) $\frac{25}{56}$
- 138.** If five balls from each bag B & D are chosen randomly, then find the maximum possible probability of that red balls is remaining in the bags?
 (a) $\frac{2}{3}$ (b) $\frac{8}{15}$ (c) $\frac{4}{7}$ (d) $\frac{3}{5}$ (e) $\frac{4}{15}$
- 139.** In bag F, number of white balls are five less than that of in bag E and number of red balls are same as E. Find probability of selecting one white ball & one red balls from bag F. (white balls > red balls, in bag E)?
 (a) $\frac{40}{87}$ (b) $\frac{14}{29}$ (c) $\frac{43}{87}$ (d) $\frac{2}{3}$ (e) $\frac{16}{29}$
- 140.** Ratio of number of white balls and red balls rotten in bag A is 1 : 2 respectively and all rotten balls throw out from the bag. If two balls chosen from remaining balls of bag A, then probability of both being either white or red is $\frac{11}{18}$. Find difference between number of white and red balls that rotten in bag A (white balls > red balls, in bag A)? **(2 Marks)**
 (a) 6 (b) Can't be determined (c) 1 (d) 4 (e) 2

Direction (141 – 145): Given below table shows number of days taken by P & Q together, Q & R together, P & R together and S alone to complete four different work X, Y, Z & W. Read the data carefully and answer the question.

Person	Work X	Work Y	Work Z	Work W
P & Q together	20	30	20	24
Q & R together	24	72	40	20
P & R together	30	36	30	48
S alone	40	40	24	40

- 141.** The ratio of time taken by R & S together to complete the work Y to time taken by Q, R & S to complete the work Z is _____?
 (a) 7 : 9 (b) 7 : 5 (c) 16 : 7 (d) 7 : 11 (e) 7 : 13
- 142.** The difference between time taken by R & S together to complete work X and time taken by S & P to complete work Z is _____?
 (a) $21\frac{1}{48}$ (b) $18\frac{1}{52}$ (c) $16\frac{1}{56}$ (d) $12\frac{28}{51}$ (e) $14\frac{1}{64}$

143. If P & R work for 8 days on work W and after that P left the work and R & Q work together for 12 days, then in ____ days remaining work will be completed by S with the help of R?
 (a) $5\frac{1}{4}$ (b) $7\frac{1}{8}$ (c) $5\frac{17}{19}$ (d) $7\frac{1}{3}$ (e) $8\frac{1}{3}$
144. If P & Q start work X and did it for first 24 days alternatively after that P left the work and Q & R work for next 16 days alternatively on same work and then left the work, then in ____ days S will be completed remaining work alone?
 (a) $2\frac{2}{3}$ (b) $7\frac{2}{3}$ (c) $5\frac{2}{3}$ (d) $1\frac{2}{3}$ (e) $9\frac{2}{3}$
145. All P, Q, R & S start work D, which is 200% more than work W with same efficiency at they all do work W expect R. If R work with 300% more efficiently with P, Q & S together, then in ____ days' work D will be completed?
 (a) 20 (b) 18 (c) 30 (d) 24 (e) 28

Practice MCQs for Mains_(Solutions)

1. (e): selling price of article D = $\frac{150}{3} \times 2 = \text{Rs. } 100$
 Market price of article C = $100 + 650 = \text{Rs. } 750$
 Selling price of article C = $750 \times \frac{90}{100} = \text{Rs. } 675$
 Profit on article C = $750 \times \frac{10}{100} + 100 = \text{Rs. } 175$
 Cost price of article C = $675 - 175 = \text{Rs. } 500$
2. (a): Let discount % for article A = $x\%$
 Then, profit% will be $2x\%$.
 ATQ
 $2 \times \frac{600}{100+2x} \times 100 = \frac{600}{100-x} \times 100$
 $2(100-x) = 100 + 2x$
 $200 - 2x = 100 + 2x$
 $100 = 4x$
 $x = 25\%$
 Market price of article A = $\frac{600}{100-25} \times 100 = \text{Rs. } 800$
3. (b): Profit earned on article E = $450 \times \frac{1}{9} = \text{Rs. } 50$
 Loss incurred on article B = $500 - 200 = \text{Rs. } 300$
 Required percentage = $\frac{300-50}{300} \times 100$
 $= \frac{250}{300} \times 100$
 $\approx 83\%$
4. (d): Market price of article B = $\frac{200}{32} \times 100 = \text{Rs. } 625$
 Market price of article C = $\frac{675}{90} \times 100 = \text{Rs. } 750$
 Required ratio = $625:750 = 5:6$
5. (d): selling price of article E = $450 \times \frac{10}{9} = \text{Rs. } 500$
 Required percentage = $\frac{500-150}{150} \times 100$
 $= \frac{350}{150} \times 100 = 233\frac{1}{3}\%$
6. (d): Let marked price of each article is Rs.100x.
 Selling price of article B = $100x \times \frac{67.5}{100} = \text{Rs. } 67.5x$
 Cost price of article B = $67.5x \times \frac{100}{120} = \text{Rs. } 56.25x$
 Now, cost price of article A = Rs. $56.25x + 20$

ATQ

$$56.25x + 56.25x + 20 = 122.5 \times 2$$

$$x = 2$$

$$\text{M.R.P of article B} = 100 \times 2 = \text{Rs. } 200$$

7. (a): Let the marked price for each article is Rs 100x
 Selling price of article B for seller S = $100x \times \frac{87.5}{100} = 87.5x$
 And cost price of article B for seller S = $\frac{87.5x}{1.75} = 50x$
 Selling price of article A for seller T = $100x \times \frac{80}{100} = 80x$
 cost price of article A for seller T = $\frac{80x}{1.4} = \frac{400}{7}x$
 So, the required ratio = $\frac{50x \times 7}{400x} = \frac{7}{8} = 7:8$
8. (b): Let marked price of each article is Rs 100x.
 Selling price of article B for seller Q = $100x \times \frac{87.5}{100} = \text{Rs. } 87.5x$
 Cost price of article B for seller Q = $\frac{87.5x}{1.25} = \text{Rs. } 70x$
 Selling price of article A for seller P = $100x \times \frac{85}{100} = \text{Rs. } 85x$
 Cost price of article A for seller P = $\frac{85x}{1.3} = \text{Rs. } \frac{850x}{13}$
 ATQ
 $85x - 70x = 390$
 $x = 26$
 Cost price of article A for seller P = $\frac{850}{13} \times 26 = \text{Rs. } 1700$
9. (c): Let the marked price of each article is Rs 100x.
 Selling price of article A sold by seller P
 $= 100x \times \frac{84}{100} = 84x$
 Cost price of article A for seller P = $\frac{84x}{1.3} = 3360$
 So, $x = 52$
 Selling price of article B for seller P = $100x \times \frac{90}{100} = 90x = \text{Rs } 4680$

Cost price of article B for seller P

$$= \frac{4680}{1.25} = \text{Rs } 3744$$

$$\text{So, required percentage} = \frac{3360}{3744} \times 100 \approx 90\%$$

- 10. (e):** Let market price of each article is Rs 100x and discount percentage given by seller R on article A be 'd'.

ATQ

$$100x \times \frac{90}{100} \times \frac{100}{125} = 100x \times \left[1 - \frac{d}{100}\right] \times \frac{100}{115}$$

$$72x = \frac{20x}{23} \times [100 - d]$$

$$d = 17.2\%$$

- 11. (d):** Total revenue from sales of all Macbook Air =
65000 × 15

$$= \text{Rs. } 9,75,000$$

$$\text{Total revenue from sales of all DELL Inspiron} = \frac{975000}{97.5} \times 100$$

$$= \text{Rs. } 10,00,000$$

$$\text{Selling price of 1 unit of DELL Inspiron} = \frac{10,00,000}{20}$$

$$= \text{Rs. } 50,000$$

$$\text{Now, cost price of 1 unit of Macbook Air} = 45000 \times \frac{10}{9}$$

$$= \text{Rs. } 50,000$$

$$\text{Total profit earned on all DELL Inspiron} = (50,000 - 40,000) \times 20$$

$$= \text{Rs. } 2,00,000$$

$$\text{Total profit earned on all Macbook Air}$$

$$= (65,000 - 50,000) \times 15$$

$$= \text{Rs. } 2,25,000$$

$$\text{Required profit percentage}$$

$$= \frac{2,00,000 + 2,25,000}{(50,000 \times 15) + (40,000 \times 20)} \times 100 = 27 \frac{13}{31} \%$$

- 12. (b):** Units sold of ASUS Vivobook = $20 \times \frac{5}{4} = 25$ units

$$\text{Units sold of HP x360} = 20 \times \frac{4}{4}$$

$$= 20 \text{ units}$$

$$\text{Discount allowed on 1 unit of HP x360}$$

$$= \frac{100}{150} \times (75,000 - 60,000) = \text{Rs. } 10,000$$

$$\text{Selling price of 1 unit of HP x360} = 80,000 - 10,000$$

$$= \text{Rs. } 70,000$$

$$\text{Required revenue} = (70,000 \times 20) + (60,000 \times 25)$$

$$= 14,00,000 + 15,00,000$$

$$= \text{Rs. } 29,00,000$$

- 13. (e):** Profit earned on selling 1 unit of Microsoft Surface =
 $(60,000 - 45,000) \times \frac{1}{3}$

$$= \text{Rs. } 5,000$$

$$\text{Discount allowed on 1 unit of Microsoft Surface} =$$

$$5,000 \times \frac{100}{25}$$

$$= \text{Rs. } 20,000$$

$$\text{Selling price of 1 unit of Microsoft Surface} = 1,00,000 - 20,000$$

$$= \text{Rs. } 80,000$$

$$\text{Cost price of 1 unit of Microsoft Surface} = 80,000 - 5,000$$

$$= \text{Rs. } 75,000$$

$$\text{Required average} = \frac{75,000 + 50,000 + 40,000 + 45,000}{4}$$

$$= \text{Rs. } 52,500$$

- 14. (c):** Cost price of 1 unit of Microsoft Surface

$$= \frac{9,00,000}{10} \times \frac{100}{150}$$

$$= \text{Rs. } 60,000$$

$$\text{Marked price of 1 unit of Macbook Air} = 60,000 \times \frac{100}{60}$$

$$= \text{Rs. } 1,00,000$$

$$\text{Cost price of 1 unit of Macbook Air} = 1,00,000 \times \frac{100}{200}$$

$$= \text{Rs. } 50,000$$

$$\text{Total cost price of all Macbook Air} = 50,000 \times 15$$

$$= \text{Rs. } 7,50,000$$

$$\text{Total cost price of all DELL Inspiron} = 40,000 \times 20$$

$$= \text{Rs. } 8,00,000$$

$$\text{Required \%} = \frac{7,50,000}{8,00,000} \times 100 = 93.75\%$$

- 15. (a):** Let total units sold by the store of HP x360 be y and let selling price of 1 unit each of HP x360 and DELL Inspiron be Rs.x

ATQ,

$$x \times y + 20 \times x = 21,00,000 \quad \dots(i)$$

$$\text{And, } (x - 40,000) \times 20 + (x - 50,000) \times y = 5,50,000 \quad \dots(ii)$$

$$\text{On solving (i) \& (ii), we get:}$$

$$y = 15, x = 60,000$$

- 16. (d):** Total revenue of the store from all Macbook Air =
65,000 × 15 = Rs. 9,75,000

$$\text{Total revenue of the store from all Lenovo Yoga}$$

$$= 9,75,000 \times \frac{100}{65}$$

$$= \text{Rs. } 15,00,000$$

$$\text{Total units sold of Lenovo Yoga} = \frac{15,00,000}{60,000} = 25$$

$$\text{Cost price of 1 unit of Macbook Air}$$

$$\frac{1,00,000 + 80,000 + 75,000}{3} - 30,000 = \text{Rs. } 55,000$$

$$\text{Required profit} = (65,000 - 55,000) \times 15 + (60,000 - 45,000) \times 25$$

$$= \text{Rs. } 5,25,000$$

- 17. (d):** Let marked price of P be 'M' and discount allowed on B is 'd' %

$$\text{Given, sum of selling price of same item in C \& D is Rs. 6000}$$

$$M \times \frac{90}{100} + M \times \frac{60}{100} = 6000$$

$$1.5M = 6000$$

$$M = 4000 \text{ Rs.}$$

ATQ -

$$4000 \times \frac{80}{100} + 4000 \times \frac{(100-d)}{100} + 4000 \times \frac{90}{100} =$$

$$10000$$

$$4000 - 40d = 3200$$

$$40d = 800$$

$$d = 20\%$$

- 18. (c):** Let marked price of R be 'M' and discount allowed on R in state C & D is 2d% and 'd%' respectively
ATQ -

$$M \times \frac{85}{100} + M \times \frac{90}{100} = 14000$$

$$0.85M + 0.90M = 14000$$

$$1.75M = 14000$$

$$M = 8000 \text{ Rs.}$$

$$8000 \times \frac{(100-2d)}{100} + 8000 \times \frac{(100-d)}{100} = 14800$$

$$8000 - 160d + 8000 - 80d = 14800$$

$$240d = 1200$$

$$d = 5\%$$

$$\text{Discount allowed on R in state C} = 2 \times 5 = 10\%$$

- 19. (e):** Percentage discount allowed on Q in state B = 10
 $\times \frac{250}{100} = 25\%$

Let MP and CP of article Q is 'M' and 'C' respectively

$$\frac{90}{100} \times M = \frac{135}{100} \times C \text{ (for state A) -----(1)}$$

$$\frac{75}{100} \times M = \frac{?}{100} \times C \text{ (for state B) -----(2)}$$

Divide (1) by (2)

$$? = \frac{135 \times 75}{90}$$

$$? = 112.5$$

$$\text{Hence, Profit \%} = 112.5 - 100 = 12.5\%$$

- 20. (d):** Let marked price of S be 'M' and discount allowed on S in state C be 'd'%

ATQ -

Total discount allowed in A & C together on item

$$S = M \times \frac{(20+d)}{100} = 2100 \text{ ----- (i)}$$

Total discount allowed in B & C together on item

$$S = M \times \frac{(10+d)}{100} = 1500 \text{ ----- (ii)}$$

Divide (i) by (ii), we get

$$\frac{(20+d)}{(10+d)} = \frac{7}{5}$$

$$100 + 5d = 70 + 7d$$

$$2d = 30$$

$$d = 15\%$$

$$M = \frac{2100 \times 100}{35}$$

$$M = 6000 \text{ Rs.}$$

$$\text{Discount allowed on S in state C} = 6000 \times \frac{15}{100} = 900 \text{ Rs.}$$

Sol (21-25):

Let total capacity of tank - P be 1680x liters and let total capacity of tank - Q be 1800y liters.

While filling tank - P:

$$\text{Efficiency of pipe - A} = \frac{1680x}{16}$$

$$= 105x \text{ liters/hour}$$

$$\text{Efficiency of pipe - B} = \frac{1680x}{35}$$

$$= 48x \text{ liters/hour}$$

$$\text{Efficiency of pipe - C} = \frac{1680x}{42}$$

$$= 40x \text{ liters/hour}$$

$$\text{Efficiency of pipe - D} = \frac{1680x}{30}$$

$$= 56x \text{ liters/hour}$$

$$\text{Efficiency of pipe - E} = \frac{1680x}{28}$$

$$= 60x \text{ liters/hour}$$

While filling tank - Q:

$$\text{Efficiency of pipe - A} = \frac{1800y}{25}$$

$$= 72y \text{ liters/hour}$$

$$\text{Efficiency of pipe - B} = \frac{1800y}{40}$$

$$= 45y \text{ liters/hour}$$

$$\text{Efficiency of pipe - C} = \frac{1800y}{18}$$

$$= 100y \text{ liters/hour}$$

$$\text{Efficiency of pipe - D} = \frac{1800y}{24}$$

$$= 75y \text{ liters/hour}$$

$$\text{Efficiency of pipe - E} = \frac{1800y}{30} = 60y \text{ liters/hour}$$

21. (d): ATQ,

$$\text{Total capacity of tank - Q} = \frac{100}{3} \times 48x$$

$$= 1600x$$

$$\text{Now, } 1680x - 1600x = 360$$

$$\Rightarrow x = 4.5$$

$$\text{Required capacity} = 1600x + 1680x$$

$$= 14760 \text{ liters}$$

- 22. (b):** When pipe - A, C & E opened alternatively, then:

Pipe - A & C each worked for 10 hours and pipe - E worked for $9\frac{1}{3}$ hours.

$$\text{Tank - Q filled by pipe - A \& E} = 10 \times 72y + \frac{28}{3} \times 60y$$

$$= 1280y \text{ liters}$$

$$\text{Part of tank - Q filled by pipe - C} = 1800y - 1280y = 520y \text{ liters}$$

$$\text{Water supplied by pipe - C in 10 hours} = 40x \times 10 = 400x \text{ liters}$$

ATQ,

$$520y = 400x$$

$$x = 1.3y$$

$$\text{Required \%} = \frac{1680 \times 1.3y}{1800y} \times 100 = 121\frac{1}{3}\%$$

23. (b): Time taken by C & E together to fill tank – P

$$= \frac{1680x}{40x+60x} = 16.8 \text{ hours}$$

Time taken by B & D together to fill tank – Q

$$= \frac{1800y}{45y+75y} = 15 \text{ hours}$$

$$\text{Required \%} = \frac{16.8}{15} \times 100$$

$$= 112\%$$

24. (a): Time taken by pipe – B & D together to fill tank –

$$Q = \frac{1800y}{45y+75y} = 15 \text{ hours}$$

ATQ,

Water supplied by pipe – D in 15 hours = $15 \times 75y$

$$3375 = 1125y$$

$$\Rightarrow y = 3$$

Total capacity of tank – P = $1800 \times 3 + 3000$

$$= 8400 \text{ liters}$$

$$\text{Now, } 1680x = 8400$$

$$\Rightarrow x = 5$$

Required quantity of water = $6 \times (105x + 60x)$

$$= 990x = 4950 \text{ liters}$$

25. (e): Water supplied by pipe – B, C & E together in tank – P in 5 hours = $5 \times (48x + 40x + 60x)$

$$= 740x$$

ATQ,

$$\frac{740x}{1800y} = \frac{518}{900}$$

$$\Rightarrow \frac{x}{y} = \frac{7}{5} \quad \dots(i)$$

Tank – Q filled by pipe – A in 14 hours = $14 \times 72y$

$$5040 = 1008y$$

$$\Rightarrow y = 5$$

Put value of y in (i):

$$x = 7$$

$$\text{Required time} = \frac{8232}{56 \times 7}$$

$$= 21 \text{ hours}$$

26. (b): Selling price of C = $\frac{150}{100} \times 280$

$$= \text{Rs.}420$$

Now, selling price of A = $260 + 420$

$$= \text{Rs.}680$$

Marked price of A = $680 + 120$

$$= \text{Rs.}800$$

And, marked price of C = $420 + 280$

$$= \text{Rs.}700$$

$$\text{Required \%} = \frac{800+700}{800+400} \times 100$$

$$= 125\%$$

27. (e): Selling price of article – D = $\left(720 \times \frac{400}{300}\right) - 160$

$$= \text{Rs.}800$$

$$\text{Selling price of article – F} = \frac{160}{100} \times 800$$

$$= \text{Rs.}1280$$

Let marked price of article – B be Rs.y

So, amount of profit on article – B = $(y - 360) - 800$

$$= \text{Rs.} (y - 1160)$$

ATQ,

$$\frac{y-1160}{y} = \frac{27.5}{100}$$

$$y = 1600$$

Now, cost price of article – F = $(1600 - 360)$

$$= \text{Rs.}1240$$

$$\text{Required amount} = 1280 - 1240$$

$$= \text{Rs.}40$$

28. (d): Let marked price of E & profit earned on E be Rs.25a & Rs.9a respectively.

$$\text{Now, } (25a - 240) = (400 + 9a)$$

$$a = 40$$

So, selling price of E = $25 \times 40 - 240$

$$= \text{Rs.}760$$

Selling price of C = $(800 - 280)$

$$= \text{Rs.}520$$

Cost price of A & B together = $640 + 800$

$$= \text{Rs.}1440$$

Required difference = $1440 - (760 + 520)$

$$= \text{Rs.}160$$

29. (a): Let the Selling Price of A & B be 17x and 21x respectively

Marked Price of A & B be 17x+120 and 21x+360 respectively

$$17x+120+21x+360=2000$$

$$38x+480=2000$$

$$x=40$$

Hence, Selling Price of A = $17 \times 40 = 680$

And, Selling Price of B = $21 \times 40 = 840$

$$\text{Required amount} = ((680 - 640) \times 12) + ((840 - 800) \times 17)$$

$$= \text{Rs.}1160$$

30. (c): Let marked price of D be Rs.100y

$$\text{So, selling price of D} = \frac{84}{100} \times 100y$$

$$= \text{Rs.}84y$$

ATQ,

$$84y + 160 = 100y$$

$$y = 10$$

Hence, marked price of D = 100y

$$= \text{Rs.}1000$$

Selling Price of B = 1000 Rs

Now, marked price of B = $1000 + 360$

$$= \text{Rs.}1360$$

And, marked price of E = $400 + (1000 - 800) + 240$

$$= \text{Rs.}840$$

$$\text{Required amount} = 1360 + 840 = \text{Rs.}2200$$

- 31. (a):** Let total number of blue balls in the bag C = a
 So, total number of red balls in the bag C = a + 2
 And, (a + 2) will be maximum when green balls in the bag C is 1

$$\text{So, } a + (a + 2) = 15 - 1$$

$$a = 6$$

So, red balls in bag C = 8

Three balls are taken out from the bag C and for probability such that maximum red balls are left in the bag C, there will be two cases. First, all three balls taken out are of blue color and second, two blue and one green color ball is taken out.

$$\text{So, Required probability} = \frac{8}{15-3} = \frac{2}{3}$$

- 32. (e):** Let total number of red balls in C = 7x
 Total number of blue balls in C = (7x - 2)
 So, total number of red balls in D = 8x
 Total number of blue balls in D = (8x - 1)

ATQ -

$$\frac{7x}{15} + \frac{8x}{20} = \frac{13}{15}$$

$$\frac{28x+24x}{60} = \frac{13}{15}$$

$$x = 1$$

$$\text{Total number of green balls in C} = 15 - (7 \times 1 + 7 \times 1 - 2) = 3$$

$$\text{Total number of green balls in D} = 20 - (8 \times 1 + 8 \times 1 - 1) = 5$$

$$\text{Required difference} = 5 - 3 = 2$$

- 33. (b):** Let total number of blue balls in bag B be 'a'
 Then total number of red balls in the bag B will be either (a-4) or (a+4)

$$\text{ATQ, } \frac{a}{18} = \frac{2}{9}$$

$$a = 4$$

Hence, red balls in the bag B will be either 0 or 8.

Since number of red balls cannot be 0

So, number of blue balls are 4 and number of red balls are 8

$$\text{Number of green balls} = 18 - (4 + 8) = 6$$

$$\text{Required Ratio} = \frac{6}{8} = 3:4$$

- 34. (d):** Let total number of blue balls in A = 6x
 Then total number of red balls in A = 6x + 2
 Let total number of blue balls in bag C = 5x
 Then total number of red balls in bag C = 5x + 2

$$\frac{(6x+2)}{18} - \frac{(5x+2)(5x+1)}{15 \times 14} = \frac{11}{45}$$

$$\frac{(3x+1)}{9} - \frac{(25x^2+15x+2)}{210} = \frac{11}{45}$$

$$x = 1$$

$$\text{Green balls in A} = 18 - (6 \times 1 + 6 \times 1 + 2) = 4$$

$$\text{Green balls in C} = 15 - (5 \times 1 + 5 \times 1 + 2) = 3$$

$$\text{Required sum} = 4 + 3 = 7$$

- 35. (b):** Time efficiency

B	15	36	
C	12	45	540 (Total work)
S	27	20	

$$(B + C) \text{ 1 day work} = 81 \text{ units.}$$

$$\text{Work done by (B + C) in 5 days} = 405 \text{ units.}$$

$$\text{Required time} = \frac{135}{20} = 6\frac{3}{4} \text{ days.}$$

- 36. (c):**

	days	efficiency	
A	10	9	
R	18	5	90 units (Total work).

$$\text{Work done by R in 4 days} = 4 \times 5 = 20 \text{ units.}$$

$$\text{Required number of days} = \frac{90-20}{14} = 5 \text{ days.}$$

- 37. (a):**

	days	efficiency	
R	18	8	
D	18	8	144 units
C	12	12	

$$\text{Share of C} = \frac{5600}{28} \times 12.$$

$$= \text{Rs. 2400}$$

- 38. (e):** Time taken by P to do 150% of the given work = 16 × 1.5 = 24 days.

Time taken by Q to do 150% of the given work = 27 days.

	days	efficiency	
P	24	9	
Q	27	8	216 units
P+Q+X	8.64	25	

$$\text{Efficiency of X} = 25 - (8 + 9) = 8 \text{ units/day.}$$

$$\text{Time taken by X to do 150% of the given work} = \frac{216}{8} = 27 \text{ days}$$

$$\text{So, time taken by X to do the given work} = \frac{27}{1.5} = 18 \text{ days.}$$

- 39. (c):** Time taken by Q to do the work = 18 days

Time taken by Y to do the work = 9 days.

$$(Y + Q) \text{ will do the whole work} = \frac{18 \times 9}{18+9} = 6 \text{ days}$$

$$(Y + Q) \text{ will do } \frac{2}{3} \text{rd of the work} = 6 \times \frac{2}{3} = 4 \text{ days.}$$

- 40. (d):** Let cost price of article P in shop A be Rs.400x.

$$\text{So, cost price of article P in shop D} = \frac{125}{100} \times 400x$$

$$= \text{Rs. } 500x$$

Selling price of article P for shop D

$$= 500x \times \frac{137.5}{100} \times \frac{80}{100} = 550x$$

ATQ,

$$550x - 500x = 150$$

$$x = \frac{150}{50} = 3 \text{ Rs.}$$

Mark price of article Q in shop A

$$= 400 \times 3 \times \frac{140}{100} \times \frac{5}{4} = 2100 \text{ Rs.}$$

$$\text{Selling price of article Q for shop A} = 2100 \times \frac{65}{100}$$

$$= 1365 \text{ Rs.}$$

$$\text{Required profit} = 1365 - 400 \times 3$$

$$= \text{Rs } 165$$

41. (a): Let cost price of article P and Q each for shop E

$$= \text{Rs. } 100x$$

$$\text{Selling price of article P in shop E} = 100x \times \frac{125}{100} \times$$

$$\frac{95}{100} = \text{Rs. } 118.75x$$

$$\text{Selling price of article Q in shop E} = 118.75x - 260$$

ATQ,

$$118.75x - 100x + (118.75x - 260) - 100x = 715$$

$$\Rightarrow 37.5x = 975 \text{ Rs.}$$

$$\Rightarrow x = 26 \text{ Rs.}$$

$$\text{Mark price of article Q for shop E} = 100x \times \frac{125}{100} \times$$

$$\frac{7}{5} = \text{Rs. } 175x$$

$$= 175 \times 26 = 4550 \text{ Rs.}$$

$$\text{Required \%} = \frac{4550 - [118.75x - 260]}{4550} \times 100$$

$$= \frac{1722.5}{4550} \times 100 = 37.86\% \approx 38\%$$

42. (c): Let cost price of article P for shop B = Rs. 100x

$$\text{Cost price of article Q for shop B} = \text{Rs. } 80x$$

$$\text{Mark price of article Q for shop B} = 100x \times \frac{125}{100} \times$$

$$\frac{4}{3} = \text{Rs. } \frac{500x}{3}$$

$$\text{Selling price of article Q for shop B} = \frac{500x}{3} \times \frac{60}{100} =$$

$$\text{Rs. } 100x$$

$$\text{Profit \%} = \frac{100x - 80x}{80x} \times 100 = \frac{20}{80} \times 100 = 25\%$$

43. (d): Let cost price of article P on respective shops (A, B, C, D & E) be Rs. 100x, Rs. 200x, Rs. 300x, Rs. 400x and Rs. 500x respectively.

$$\text{Profit on selling article P for shop A} = 100x \times \frac{140}{100} \times \frac{90}{100} - 100x = \text{Rs. } 26x$$

$$\text{Profit on selling article P for shop B} = 200x \times \frac{125}{100} \times \frac{90}{100} - 200x = \text{Rs. } 25x$$

$$\text{Profit on selling article P for shop C} = 300x \times \frac{132.5}{100} \times \frac{85}{100} - 300x = \text{Rs. } 37.875x$$

$$\text{Profit on selling article P on D} = 400x \times \frac{137.5}{100} \times \frac{80}{100} - 400x = \text{Rs. } 40x$$

$$\text{Profit on selling article P on E} = 500x \times \frac{125}{100} \times \frac{95}{100} - 500x = \text{Rs. } 93.75x$$

$$\text{Total profit} = 26x + 25x + 37.875x + 40x + 93.75x = \text{Rs. } 222.625x$$

ATQ,

$$40x = 160$$

$$\Rightarrow x = 4 \text{ Rs.}$$

$$\text{Total profit} = 222.625x = 222.625 \times 4 = \text{Rs } 890.5$$

44. (d): Let marked price of article P & Q be 500x Rs. and 600x Rs. respectively

$$\text{Selling price of article P} = 500x \times \frac{90}{100} \times \frac{80}{100} = 360x \text{ Rs.}$$

$$\text{Selling price of article Q} = 600x \times \frac{7}{8} \times \frac{90}{100} = 472.5x \text{ Rs.}$$

ATQ -

$$472.5x - 360x = 450$$

$$112.5x = 450$$

$$x = 4$$

$$\text{Required difference} = (600 \times 4 - 500 \times 4) = 400 \text{ Rs.}$$

45. (a): Let marked price of P = Rs. 400x

$$\text{So, marked price of S} = 400x \times \frac{75}{100} = 300x \text{ Rs.}$$

$$\text{Selling price of P} = 400x \times \frac{90}{100} \times \frac{80}{100} = 288x \text{ Rs.}$$

$$\text{Selling price of S} = 300x \times \frac{80}{100} \times \frac{90}{100} = 216x \text{ Rs.}$$

ATQ -

$$288x + 216x = 2520$$

$$504x = 2520$$

$$x = 5$$

$$\text{Cost price of P} = 288 \times 5 \times \frac{5}{6} = 1200 \text{ Rs.}$$

$$\text{Cost price of S} = 216 \times 5 \times \frac{100}{90} = 1200 \text{ Rs.}$$

$$\text{Required ratio} = 120 : 120 = 1 : 1$$

46. (d): Let marked price of Q & S be 'x' & 'y' respectively

$$\text{Selling price of Q} = x \times \frac{7}{8} \times \frac{90}{100} = \frac{630x}{800}$$

$$\text{Selling price of S} = y \times \frac{80}{100} \times \frac{90}{100} = \frac{72y}{100}$$

$$\text{ATQ, } \frac{630x}{800} : \frac{72y}{100} = 7 : 4$$

$$x : y = 8 : 5$$

47. (a): Let marked price of P be Rs. 400x

$$\text{So, selling price of P} = 400x \times \frac{90}{100} \times \frac{80}{100} = \text{Rs. } 288x$$

When, second discount is increased by 25%, then new selling price of P

$$= 400x \times \frac{90}{100} \times \frac{75}{100} = 270x \text{ Rs.}$$

$$\text{Given, } 288x - 270x = 90$$

$$18x = 90$$

$$x = 5$$

$$\text{Selling price of R} = 288 \times 5 - 110 = 1330 \text{ Rs.}$$

$$\text{Marked price of R} = 1330 \times \frac{100}{87.5} \times \frac{100}{95} = 1600 \text{ Rs.}$$

48. (c): Let marked price of P & S be Rs. 'a' and Rs. 'b' respectively

$$\text{Selling price of P} = a \times \frac{90}{100} \times \frac{80}{100} = 0.72a \text{ Rs.}$$

$$\text{Selling price of S} = b \times \frac{80}{100} \times \frac{90}{100} = 0.72b \text{ Rs.}$$

ATQ -

$$0.72a : 0.72b = 4 : 3$$

$$a : b = 4 : 3$$

So, marked price of P and S is Rs. 4000 and Rs. 3000

Selling price of P = $4000 \times 0.72 = 2880$ Rs.

Selling price of S = $3000 \times 0.72 = 2160$ Rs.

Required difference = $2880 - 2160 = 720$ Rs.

- 49. (a):** Distance covered by boat A in upstream in 30 minutes = $25 \times \frac{16}{100} = 4$ km

Distance covered by boat C in upstream 15 minutes = $25 \times \frac{4}{100} = 1$ km

Upstream speed for A = $4 \times \frac{60}{30} = 8$ km/hr.

Upstream speed for C = $1 \times \frac{60}{15} = 4$ km/hr.

Let speed of stream for A be x and speed of boat A in still water be $3x$

Now, let speed of stream for C be a and speed of boat C in still water be $2a$

ATQ –

$$3x - x = 8$$

$$x = 4$$

So, speed for boat A in still water = 12 km/hr

Now, $2a - a = 4$

$$a = 4$$

So, speed for boat C in still water = 8 km/hr

Required ratio = $\frac{96}{(12+4)} : \frac{96}{(8+4)} = 3 : 4$

- 50. (a):** Distance covered by boat D in upstream in 30 minutes = $25 \times \frac{12}{100} = 3$ km

Let speed of stream for D be $2x$ and speed of boat D in still water be $5x$

Upstream speed for boat D = $3 \times \frac{60}{30} = 6$ km/hr.

ATQ –

$$5x - 2x = 6$$

$$x = 2 \text{ km/hr}$$

Downstream speed for boat D = $5 \times 2 + 4 = 14$ km/hr

Now,

$$\frac{D}{14} + \frac{D}{6} = 20$$

$$\frac{3D+7D}{42} = 20$$

$$D = 84 \text{ km}$$

Total distance covered by boat D = $84 + 84 = 168$ km

- 51. (e):** Distance covered by boat E in upstream in 24 minutes = $25 \times \frac{32}{100} = 8$ km

Distance covered by boat B in upstream in 45 minutes = $25 \times \frac{36}{100} = 9$ km

Upstream speed for boat E = $8 \times \frac{60}{24} = 20$ km/hr

Upstream speed for boat B = $9 \times \frac{60}{45} = 12$ km/hr

Let speed of stream for E be x and speed of boat E in still water be $6x$

$$6x - x = 20$$

$$5x = 20$$

$$x = 4$$

Downstream speed for boat E = $6 \times 4 + 4 = 28$ km/hr

Same, let speed of stream for B be b and speed of boat B in still water be $4b$

$$4b - b = 12$$

$$3b = 12$$

$$b = 4$$

Downstream speed for boat B = $4 \times 4 + 4 = 20$ km/hr

Required percentage = $\frac{28-20}{20} \times 100 = 40\%$

- 52. (d):** Distance covered by boat B in upstream in 45 minutes = $25 \times \frac{36}{100} = 9$ km

Upstream speed for boat B = $9 \times \frac{60}{45} = 12$ km/hr

Let speed of stream for B be x and speed of boat B in still water be $4x$

ATQ,

$$4x - x = 12$$

$$3x = 12$$

$$x = 4$$

Downstream speed for boat B

$$= 4 \times 4 + 4 = 20 \text{ km/hr}$$

So, downstream speed of boat F

$$= 20 \times \frac{175}{100} = 35 \text{ km/hr}$$

Let speed of stream for F be $2f$ and speed of boat F in still water be $5f$

$$\text{ATQ} - 5f + 2f = 35$$

$$f = 5$$

Upstream speed for boat F

$$= 5 \times 5 - 2 \times 5 = 15 \text{ km/hr}$$

Required time = $\frac{120}{15} = 8$ hours

- 53. (c):** Distance covered by boat D in upstream in 30 minutes = $25 \times \frac{12}{100} = 3$ km

Let speed of stream for D be $2x$ and speed of boat D in still water be $5x$

Upstream speed for boat D = $3 \times \frac{60}{30} = 6$ km/hr.

ATQ –

$$5x - 2x = 6$$

$$x = 2$$

Downstream speed for boat D = $5 \times 2 + 4 = 14$ km/hr

Distance covered by boat A in upstream in 30 minutes = $25 \times \frac{16}{100} = 4$ km

Upstream speed for A = $4 \times \frac{60}{30} = 8$ km/hr.

Let speed of stream for A be a and speed of boat A in still water be $3a$

ATQ –

$$3a - a = 8$$

$$a = 4$$

Downstream speed of boat A = $3 \times 4 + 4 = 16$ km/hr

Required difference = $16 - 14 = 2$ km/hr

- 54. (d):** let one – side distance from starting position to final place for Amit & Deepak be x & y kms respectively

$$\text{ATQ, } \frac{x}{30} + \frac{x}{40} = \frac{y}{45} + \frac{y}{60}$$

$$\frac{x}{y} = \frac{2}{3}$$

Let x & y be $2k$ & $3k$ respectively.

$$\text{Required \%} = \frac{6k-4k}{6k} \times 100 = 33\frac{1}{3}\%$$

- 55. (a):** average speed of Ayush = $\frac{2 \times 40 \times 50}{90} = \frac{400}{9}$ kmph

$$\text{Average speed of Mohit} = \frac{2 \times 50 \times 30}{80} = \frac{75}{2} \text{ kmph}$$

$$\text{Required difference} = \frac{400}{9} - \frac{75}{2} = 7 \text{ kmph (approx.)}$$

- 56. (b):** since speed of Ayush is more than that of Shivam so Ayush meet Shivam while returning

Time taken by Ayush to reach city X = 7 hrs

Distance travelled by Shivam in 7 hrs = 245 kms

Total meeting time = $\frac{280-245}{85} \times 60 + 7$ hours = 7 hours 25 minutes (approx.)

Required time = 7:00 AM + 7 hours 25 minutes = 2:25 PM (approx.)

- 57. (e):** let distance covered by each of Deepak & Mohit to reach city Y be d km

$$\text{Required ratio} = \frac{d}{45} : \frac{d}{50} = 10 : 9$$

- 58. (e):** Let selling price of A and that of C be Rs $40x$ & Rs $27x$ respectively.

$$\text{So, marked price of C} = 27x \times \frac{100}{90} = \text{Rs } 30x$$

$$\text{And, cost price of A} = 40x \times \frac{100}{80} \times \frac{100}{125} = \text{Rs } 40x$$

$$\text{Required \%} = \frac{30x}{40x} \times 100 = 75\%$$

- 59. (b):** Let marked price of B be Rs. $100x$.

$$\text{So, selling price of D} = \frac{140}{100} \times 100x = \text{Rs. } 140x$$

$$\text{Now, selling price of B} = 100x \times \frac{85}{100} = \text{Rs. } 85x$$

$$\text{And, cost price of D} = 140x \times \frac{100}{75} \times \frac{100}{140} = \text{Rs. } \frac{400x}{3}$$

$$\text{ATQ, } \frac{400x}{3} - 85x = 290$$

$$x = 6$$

$$\text{Selling price of B} = 85 \times 6 = \text{Rs } 510$$

$$\text{Selling price of D} = 140 \times 6 = \text{Rs } 840$$

$$\text{Cost price of B} = 100 \times 6 \times \frac{100}{120} = \text{Rs } 500$$

$$\text{Cost price of D} = \frac{400}{3} \times 6 = \text{Rs } 800$$

Required Profit

$$= (510 - 500) + (840 - 800) = \text{Rs. } 50$$

- 60. (a):** Let cost price of A and that of E be Rs. $100x$ & Rs. $100y$ respectively.

$$\text{Selling price of A} = 100x \times \frac{125}{100} \times \frac{80}{100} = 100x$$

$$\text{Selling price of E} = 100y \times \frac{160}{100} \times \frac{70}{100} = 112y$$

ATQ,

$$(100x - 100x) + (112y - 100y) = 36$$

$$y = 3$$

$$\text{Marked price of E} = 100 \times \frac{160}{100} \times 3$$

$$= \text{Rs } 480$$

$$\text{Required amount} = 480 - 112 \times 3$$

$$= \text{Rs } 144$$

- 61. (d):** Let cost price of C & selling price of E be Rs. $50x$ & Rs. $70x$ respectively.

$$\text{So, selling price of C} = 50x \times \frac{150}{100} \times \frac{90}{100} = \text{Rs } 67.5x$$

ATQ,

$$67.5x + 70x = 2200$$

$$x = 16$$

$$\text{Marked price of C} = 50 \times \frac{150}{100} \times 16 = \text{Rs } 1200$$

$$\text{Marked price of E} = 70 \times \frac{100}{70} \times 16 = \text{Rs } 1600$$

$$\text{Required difference} = 1600 - 1200 = \text{Rs. } 400$$

- 62. (e):** Let cost price of A & that of B be Rs. $100x$ & Rs. $100y$ respectively.

$$\text{So, selling price of A} = 100x \times \frac{125}{100} \times \frac{80}{100} = \text{Rs } 100x$$

$$\text{And, selling price of B} = 100y \times \frac{120}{100} \times \frac{85}{100}$$

$$= \text{Rs } 102y$$

$$\text{Now, marked price of A} = 100x \times \frac{125}{100} = \text{Rs } 125x$$

$$\text{And, marked price of B} = 100y \times \frac{120}{100}$$

$$= \text{Rs } 120y$$

ATQ,

$$100x + 102y = 2330$$

$$50x + 51y = 1165 \quad \dots(i)$$

$$\text{And, } 120y - 125x = 800$$

$$24y - 25x = 160 \quad \dots(ii)$$

On solving (i) & (ii):

$$y = 15, x = 8$$

$$\text{Required \%} = \frac{100 \times 15}{100 \times 8} \times 100$$

$$= 187.5\%$$

Sol. (63-65):

For project A:

$$X \times 88 = (X + 8) \times 66$$

$$\Rightarrow X = 24$$

For project B:

$$Y \times (Y - 1) = (Y + 6) (Y - 6)$$

$$\Rightarrow Y^2 - Y = Y^2 - 36$$

$$\Rightarrow Y = 36$$

For project C:

$$Z^2 \times 75 = M^2 \times 108$$

$$\Rightarrow Z = 1.2 M$$

63. (c): Total number of workers in team P

$$= 0.5 \times 1.2M \times 2M$$

$$= 1.2M^2$$

$$\text{Required days} = \frac{108 \times M^2}{1.2M^2} = 90 \text{ days.}$$

64. (c): Required days = $\frac{24 \times 88}{64} = 33$ days.**65. (b):** In 10 days, work done = $0.5 \times 36 \times 10 = 180$ units

$$\text{Now, total people} = 0.5Y + 0.5Y = 36$$

Let 36 people work for A days to complete the remaining work.

ATQ,

$$36 \times A + 180 = 36 \times 35$$

$$\Rightarrow A = 30 \text{ days.}$$

$$\text{Total required days} = 40 \text{ days}$$

66. (b): Total distance travel by train A = $1500 + 3000 = 4500$ km

$$\text{Total Time taken by train A} = \frac{4500}{80} = 56.25 \text{ hour}$$

$$\text{Time taken by train C from Mumbai to Lucknow} =$$

$$\frac{1000}{120} = \frac{50}{6} \text{ hours}$$

$$\text{Time taken by train C from Lucknow to Delhi} =$$

$$56.25 - \frac{50}{6}$$

$$= \frac{287.5}{6} \text{ hours}$$

$$\text{Distance between Lucknow to Delhi}$$

$$= \frac{287.5}{6} \times 120 = 5750 \text{ km}$$

67. (a): Distance between Lucknow and Kanpur =

$$\sqrt{1000^2 + 1500^2} = \sqrt{1000000 + 2250000}$$

$$= \sqrt{3250000} = 500\sqrt{13} \text{ km}$$

Approximate time taken by train E

$$= \frac{500\sqrt{13}}{150} \approx 12 \text{ hours}$$

68. (c): Let speeds of train B and train D be a km/hr and b km/hr respectively.

ATQ—

$$\Rightarrow \frac{3000}{a} = \frac{2000}{b}$$

$$\Rightarrow \frac{a}{b} = \frac{3}{2}$$

Let speed of train B and train D be 3x km/hr and 2x km/hr respectively

Distance between Delhi and Gorkhpur = 1500 km

$$\text{Time taken to cross each other} = \frac{1500}{5x} = \frac{300}{x}$$

Time taken by train B to reach Delhi from Mumbai

$$= \frac{3000}{3x} = \frac{1000}{x}$$

$$\text{Required\%} = \frac{300 \times 100}{1000} = 30\%$$

69. (d): Distance at policeman catch the thief

$$\frac{1500 \times 3}{5} = 900 \text{ km}$$

$$\text{Time taken by train C to cover this distance} = \frac{900}{120}$$

$$= 7.5 \text{ hour}$$

Let initial speed of train D = s km/hr

So, ATQ

$$6s + 7.5(2s) = 900$$

$$6s + 15s = 900$$

$$21s = 900$$

$$S = \frac{300}{7} \text{ km/hr}$$

70. (e): Distance between Mumbai and Lucknow = 1000 km

Distance covered by train B before first meeting = 1200 km

Distance covered by train A before first meeting = 800 km

Speed of train A = 80 km/hr

$$\Rightarrow \text{Time for first meeting} = \frac{800}{80} = 10 \text{ hours}$$

$$\text{Speed of train B} = \frac{1200}{10} = 120 \text{ km/hr}$$

When train A reaches Lucknow, distance covered by train B = $\frac{200}{80} \times 120 = 300$ km

Time taken by train B to reach Mumbai

$$= \frac{500}{120} = \frac{25}{6} \text{ hr}$$

$$\text{Distance covered by train A' in } \frac{25}{6} \text{ hour} = \frac{25}{6} \times 80 = \frac{1000}{3} \text{ km}$$

$$\text{Distance between train B and train A} = 1000 - \frac{1000}{3} = \frac{2000}{3}$$

$$\text{Time to meet} = \frac{\frac{2000}{3}}{\frac{120+80}{3}} = \frac{10}{3} \text{ hour}$$

$$\text{Total time} = \frac{200}{80} + \frac{25}{6} + \frac{10}{3} = 10 \text{ hours}$$

71. (d): Let total mixture in vessel R for both the milkmen have be 'q'

ATQ—

$$\frac{0.44q + 0.52q}{2} = 960$$

$$q = \frac{960 \times 2}{0.96}$$

$$q = 2000 \text{ l}$$

Total mixture in vessel P for both the milkmen

$$= 1.4 \times 2000 = 2800 \text{ l}$$

$$\text{Required difference} = 2800 \times \frac{50}{100} - 2800 \times \frac{40}{100} = 280 \text{ l}$$

72. (a): Let capacity of vessel P and vessel T be $2x$ and $3x$ respectively
 ATQ –
 $\left(3x \times \frac{50}{100} + 3x \times \frac{40}{100}\right) - \left(2x \times \frac{60}{100} + 2x \times \frac{50}{100}\right) = 180$
 $2.7x - 2.2x = 180$
 $0.5x = 180$
 $x = 360$
 Required difference between water in vessel P and T
 $= \left(1080 \times \frac{50}{100} + 1080 \times \frac{60}{100}\right) - \left(720 \times \frac{40}{100} + 720 \times \frac{50}{100}\right)$
 $= 1188 - 648$
 $= 540$ liters

73. (e): Let total capacity of S & T is 'a' & 'b' respectively
 We have to find 'a - b'
 From a –
 $a \times \frac{72}{100} - b \times \frac{50}{100} = 320$
 $72a - 50b = 32000$
 From b –
 $a \times \frac{40}{100} - b \times \frac{40}{100} = 200$
 $0.4a - 0.4b = 200$
 $a - b = 500$ l
 From d –
 Let capacity of vessel S & T be $3q$ and $2q$ respectively
 ATQ –
 $3q \times \frac{40}{100} - 2q \times \frac{40}{100} = 200$
 $1.2q - 0.8q = 200$
 $q = 500$ l
 So, either option 'b' or option 'd' can give required answer.

74. (d): Let total mixture in vessel Q = y
 From I –
 $0.6y - 0.4y = 400$
 $0.2y = 400$
 $y = 2000$ l
 Quantity of mixture sold by A to B = 2000
 $\times \frac{40}{100} \times \frac{37.5}{100} = 300$ l
 From II –
 $0.6y - 0.4y = 400$
 $0.2y = 400$
 $y = 2000$ l
 Quantity of mixture sold by A to B = 2000
 $\times \frac{40}{100} \times \frac{37.5}{100} = 300$ l
 Either statement (I) or statement (II) is sufficient to answer the question

75. (a): Let sum invested in B with C.I. = x
 Acc. to question = $1.44x = x \left(1 + \frac{r}{100}\right)^2$
 r = rate of interest of C.I. in B = 20%
 Rate of interest of S.I. in A = 10%
 Interest = $\frac{8000 \times 2 \times 10}{100} + 8000 \left[\left(1 + \frac{20}{100}\right)^2 - 1\right] = 5120$

76. (b): Interest accrued = $\frac{10000 \times 6 \times 15}{100} = 9000$
 First half 4500 on scheme B for 4 years with S.I.
 Interest = $\frac{4500 \times 12 \times 4}{100} = 2160$
 Now ratio of interest received = 3 : 2
 Interest received in scheme C
 $= \frac{2160}{3} \times 2 = 1440$
 Rate of interest in Scheme C = $\frac{1440 \times 100}{4500 \times 4} = 8\%$

77. (a): Let sum invested in each scheme = 100x
 In scheme E
 Amount after 2 year at S.I. = $100x + \frac{100x \times 2 \times 10}{100} = 120x$
 Then in C.I. = $120x \left(1 + \frac{20}{100}\right)^2 = \frac{864}{5}x$
 In scheme D
 Amount after 4 years at S.I. = $\frac{100x \times 4 \times 15}{100} + 100x = 160x$
 Required ratio = $\frac{864x}{5} : 160x = 27 : 25$

78. (c): Let amount he invested in scheme A with x
 Now
 $778688 = x \left(1 - \frac{8}{100}\right)^3$
 $x = 10,00,000$
 Now this amount is the interest received from scheme D and E with S.I.
 Let amount invested in both scheme = y
 Total interest earn in 4 years from both scheme
 $10,00,000 = \frac{y \times 15 \times 4}{100} + \frac{y \times 10 \times 4}{100}$
 $y = 10,00,000$
 Sum he invested = 20,00,000

79. (a): Let Initial sum = 100x
 After 7 year Amount = $100x + \frac{194}{100} \times 100x = 294x$
 In scheme C with C.I.
 Rate of interest = 40%
 Time = 2 year
 Now,
 $294x = y \left(1 + \frac{40}{100}\right)^2$
 y = sum invested in scheme C with C.I.
 $y = 150x$
 amount get from scheme (with S.I.)
 Interest = $180x - 100x = 80x$
 $80x = \frac{100x \times R \times 15}{100}$
 $R = 10\%$
 R = rate of interest for scheme C in S.I.

- 80. (a):** Total surface area of the toy = C.S.A of cone + C.S.A of Hemisphere
 Let, slant height of cone
 $\pi r \ell + 2\pi r^2 = 858 \text{ cm}^2$
 $\pi r(\ell + 2r) = 858 \text{ cm}^2$
 $\ell = 25 \text{ cm}$
 height of cone = 24 cm
 volume of the toy
 $= \frac{1}{3}\pi r^2 h + \frac{2}{3}\pi r^3$
 $= \frac{1}{3}\pi r^2(h + 2r)$
 $= 1950 \frac{2}{3} \text{ cm}^3$
- 81. (e):** Height of cylinder = 12 cm
 Height of toy is double the height of cylinder = 24 cm
 Edges of cube = 24 - 12 = 12 cm
 C.S.A of cylinder = $2\pi rh = 66 \times h$
 $r = 10.5 \text{ cm}$
 Total surface area of toy = $(6a^2 - \pi r^2) + 2\pi rh + \pi r^2$
 ($-\pi r^2$, area subtracted due to alignment)
 $= 6 \times 12 \times 12 + 2 \times \frac{22}{7} \times 12 \times 10.5 = 1656 \text{ cm}^2$
- 82. (c):** Sphere radius = $\frac{21}{2}$
 So, cylinder radius = $\frac{21}{2}$
 height of cylinder = 12
 required ratio
 $= \frac{4}{3}\pi r^3 + \pi r^2 h : \pi r^2 h : \frac{4}{3}\pi r^3$
 $\frac{4}{3}r + h : h : \frac{4}{3}r$
 13 : 6 : 7
- 83. (d):** Volume of cone = $\frac{1}{3}\pi r^2 h$
 $= \frac{1}{3} \times \frac{22}{7} \times 7 \times 7 \times 24 = 1232 \text{ cm}^3$
 Volume of cuboid
 $= 24 \times 10 \times 25\% \text{ of } 24$
 $= 1440 \text{ cm}^3$
 Difference = $1440 - 1232 = 208 \text{ cm}^3$
 Required % = $\frac{208}{1232} \times 100 = 16.88\% \approx 17\%$
- 84. (a):** Investment by Abhimanyu = $\frac{44}{100} \times 70,000 = 30,800$
 Ratio of interest shared by them
 $30800 : 39200$
 $= 11 : 14$
 Total interest = $\frac{1100}{11} \times 25 = 2500$
 $2500 = \frac{70000 \times R \times 2}{100}$
 $R = \frac{25}{14}\%$
- 85. (e):** Investment made by Abhimanyu in scheme B and C together = $\frac{35}{100} \times 65,000 + \frac{50}{100} \times 60,000$
 $= 22750 + 30000$
 $= 52750$

Investment by Gaurav in scheme A and F together
 $= \frac{56}{100} \times 70000 + \frac{60}{100} \times 55,000$
 $= 39200 + 33000$
 $= 72200$

Required % = $\frac{\left(\frac{72200 - 52750}{2}\right)}{\frac{72200}{2}} \times 100 \sim 27\%$

- 86. (e):** Investment of Abhimanyu in scheme B = $\frac{35}{100} \times 65000 = 22750$
 Investment of Gaurav in scheme B = $65000 - 22750 = 42250$
 Investment of Abhimanyu in scheme C = 30000
 Investment of Gaurav in scheme C = 30000
 Total interest for scheme B = $650000 \times \frac{2 \times 10}{100} + 22750 \times \frac{10}{100}$
 $= 13000 + 2275$
 $= 15275$
 Total interest in scheme C = $60000 \times \frac{2}{3} + 30000 \times \frac{1}{3}$
 $= 40,000 + 10,000$
 $= 50,000$
 Total Interest = $50,000 + 15,275$
 $= 65,275$

- 87. (d):** Let milk and water in A be 100x and 50x respectively
 Milk in P = $100x \times \frac{80}{100} = 80x$
 Water in P = $50x \times \frac{7}{5} = 70x$
 Total milk in resulting mixture = $80x \times \frac{60}{100} + 100x \times \frac{80}{100} = 128x$
 Total water in resulting mixture = $50x \times \frac{80}{100} + 70x \times \frac{60}{100} = 82x$
 Total resulting mixture = $128x + 82x = 210x$
 ATQ
 $210x \times 40 - 128x \times 50 = 2000$
 $x = 1$
 Required difference = $128 - 82 = 46$ liters

- 88. (a):** Water in Q = $\frac{2000}{2-1} \times 1 = 2000$ liters
 Milk in Q = $\frac{2000}{100} \times 220 = 4400$ liters
 Water in D = $4400 - 800 = 3600$ liters
 Milk in D = $\frac{3600}{9} \times 16 = 6400$ liters
 Milk in S = $\frac{6400}{100} \times 130 = 8320$ liters

89. (e): Let total milk in R & C be $4a$ & $5a$ respectively

And, water in R & C be $3b$ & $5b$ respectively

ATQ –

$$\frac{(4a+3b)}{(5a+5b)} = \frac{18}{25}$$

$$20a + 15b = 18a + 18b$$

$$2a = 3b$$

$$a : b = 3 : 2$$

$$\text{Part of milk in R} = \frac{12}{18} = \frac{2}{3}$$

$$\text{Part of milk in C} = \frac{15}{25} = \frac{3}{5}$$

Let part of milk in resulting mixture = n

By allegation we know

$$\frac{n - \frac{3}{5}}{\frac{2}{3} - n} = \frac{3}{4}$$

$$n = \frac{22}{35}$$

Let total resulting mixture = $35y$

Part of milk in resulting mixture = $22y$

Part of water in resulting mixture = $35y - 22y = 13y$

After replacing $16\frac{2}{3}\%$ of resulting mixture with same amount of water

$$\text{Remaining milk} = 22y - 22y \times \frac{50}{3} \times \frac{1}{100} = \frac{55y}{3}$$

$$\text{Remaining water} = 13y - 13y \times \frac{50}{3} \times \frac{1}{100} + 35y \times$$

$$\frac{50}{3} \times \frac{1}{100} = \frac{50y}{3}$$

Again replaced 10% of resulting mixture with amount of water

$$\text{Milk in final mixture} = \frac{55y}{3} - \left(\frac{55y}{3} \times \frac{10}{100}\right) = 16.5y$$

$$\text{Water in final mixture} = \frac{50y}{3} - \left(\frac{50y}{3} \times \frac{10}{100}\right) + 35y$$

$$\times \frac{10}{100} = 18.5y$$

$$\text{Required ratio} = \frac{16.5y}{18.5y} = 33 : 37$$

Or we can directly write as

Part of milk remaining after first operation =

$$\frac{22 - 22 \times \frac{1}{6}}{35} = \frac{11}{21}$$

Part of milk remaining after second operation =

$$\frac{11 - 11 \times \frac{1}{10}}{21} = \frac{33}{70}$$

Required ratio = $33 : 37$

90. (c): Efficiency of Veer with level 2 of efficiency A = 10

$$\times \left(\frac{80+100}{2}\right) \times \frac{1}{100} = 9 \text{ units/day}$$

Efficiency of Sameer with level 1 of efficiency A =

$$16 \times \frac{100}{100} = 16 \text{ units/day}$$

Efficiency of Neeraj with level 3 of efficiency C =

$$15 \times \frac{40}{100} = 6 \text{ units/day}$$

ATQ –

$$(16 + 9) \times d + 6 \left(d - \frac{8}{3}\right) = 480$$

$$25d + 6d - 16 = 480$$

$$31d = 496$$

$$d = 16 \text{ days}$$

Efficiency of Gopal with level 3 of efficiency B = 8

$$\times \frac{60}{100} = 4.8 \text{ units/day}$$

Work done by Gopal in $2.5d$ days = $2.5 \times 16 \times 4.8 = 192$ units

$$\text{Required portion} = \frac{192}{480} = \frac{2}{5}$$

91. (b): Let efficiency of Ayush = x units / day

Efficiency of Ayush with level 3 of efficiency A = $0.8x$ units/day

Efficiency of Neeraj with level 2 of efficiency C =

$$15 \times \left(\frac{40+60}{2}\right) \times \frac{1}{100} = 7.5 \text{ units/day}$$

Efficiency of Veer with level 2 of efficiency B = 10

$$\times \left(\frac{60+80}{2}\right) \times \frac{1}{100} = 7 \text{ units/day}$$

ATQ –

$$(7.5 + 0.8x) \times 30 + 7 \times 15 = 480$$

$$225 + 24x + 105 = 480$$

$$24x = 150$$

$$x = 6.25 \text{ units/day}$$

Total work done by Ayush & Gopal together in 33 days = $33 \times 14.25 = 470.25$ units

Remaining work = $480 - 470.25 = 9.75$ units

$$\text{Required percentage} = \frac{9.75}{48000} \times 100 = 2\frac{1}{32}\%$$

92. (d): Efficiency of Veer with level 2 of efficiency B = 10

$$\times \frac{60+80}{2} \times \frac{1}{100} = 7 \text{ units/day}$$

Efficiency of Sameer with level 2 of efficiency C =

$$16 \times \frac{40+60}{2} \times \frac{1}{100} = 8 \text{ units/day}$$

ATQ –

$$7x + 8y = 480 \text{ ----- (i)}$$

Efficiency of Gopal with level 2 of efficiency A = 8

$$\times \frac{80+100}{2} \times \frac{1}{100} = 7.2 \text{ units/day}$$

Efficiency of Neeraj with level 2 of efficiency C =

$$15 \times \left(\frac{40+60}{2}\right) \times \frac{1}{100} \times \frac{102.4}{100} = 7.68 \text{ units/day}$$

$$7.2x + 7.68y = 480 \text{ ----- (ii)}$$

From (i) and (ii) we get

$$7x + 8y = 7.2x + 7.68y$$

$$x : y = 8 : 5$$

$$y = \frac{5x}{8}$$

From (i)–

$$7x + 8 \times \frac{5x}{8} = 480$$

$$x = 40 \text{ days}$$

And, $y = 25$ days

Efficiency of Gopal with level 2 of efficiency C = 8

$$\times \frac{40+60}{2} \times \frac{1}{100} = 4 \text{ units/day}$$

Total work completes by Gopal in $(x + y)$ days = $(40 + 25) \times 4 = 260$ units

Remaining by Neeraj with his usual efficiency =

$$\frac{480 - 260}{15} = 14\frac{2}{3} \text{ days}$$

- 93. (a):** Efficiency of Veer with level 3 of efficiency C = 10
 $\times \frac{40}{100} = 4$ units/day
 Efficiency of Sameer with level 2 of efficiency C =
 $16 \times \left(\frac{40+60}{2}\right) \times \frac{1}{100} = 8$ units/day
 Efficiency of Gopal with level 1 of efficiency A = 8
 $\times \frac{100}{100} = 8$ units/day
 Efficiency of Neeraj with level 3 of efficiency A =
 $15 \times \frac{80}{100} = 12 \frac{\text{units}}{\text{day}}$
 Ratio of wages of veer, Sameer, Gopal and Neeraj
 will be in ratio of their efficiency
 $= 4: 8: 8: 12$
 $= 1: 2: 2: 3$
 ATQ
 $(1+2+2+3) 8 \text{ units} = 20000$
 $(3 - 1) 2 \text{ units} = \frac{20000}{8} \times 2 = \text{Rs. } 5000$

- 94. (a):** Let Initial investment of Charu = x
 \Rightarrow Initial investment of Amit = 1.5x
 Ratio between Amit and Charu's profit.

$$= \frac{1.5x \times 3 + (1.5x + 3000) \times 3 + (1.5x + 8000) \times 3 + (1.5x + 16000) \times 3}{x \times 3 + (x + 4000) \times 3 + (x + 7000) \times 3 + (x + 12000) \times 3}$$

$$= \frac{18x + 81000}{10x + 45000}$$

 Let, Amit's profit and Charu's profit be $(18xz + 81000z)$ and $(10xz + 45000z)$ respectively.
 ATQ,
 $18xz + 81000z - 10xz - 45000z \rightarrow 3120$
 $8xz + 36000z \rightarrow 3120$
 $2xz + 9000z \rightarrow 780$
 Charu profit = $10xz + 45000z \rightarrow 780 \times 5 = 3900$ Rs.

- 95. (c):** Let initial investment of both Bharat and Deepak is Rs x
 ATQ,

$$\frac{6x + 3 \times 4000}{6x + 3 \times 8000} = \frac{18750}{22500} = \frac{5}{6}$$

 $\Rightarrow 36x + 72,000 = 30x + 1,20,000$
 $6x = 48,000$
 $x = 8000$ Rs.

- 96. (b):** Ratio between Amit and Bharat's share in profit

$$= \frac{12 \times 12,000 + 9 \times 3000 + 6 \times 5000 + 3 \times 8000}{12 \times 10,000 + 9 \times 4000 + 6 \times 6000 + 3 \times 8000}$$

$$= \frac{2,25,000}{2,16,000} = \frac{25}{24}$$

 Required % = $\frac{25-24}{25} \times 100 = 4\%$

- 97. (d):** Let Initial investment of Charu = 9x
 \Rightarrow Initial investment of Deepak = 20x
 Ratio between Charu and Deepak's profit.

$$\frac{9x \times 3 + (9x + 4000) \times 3 + (9x + 7000) \times 3 + (9x + 12000) \times 3}{20x \times 3 + (20x + 8000) \times 3 + (20x + 13000) \times 3} = \frac{5}{9}$$

$$\Rightarrow \frac{90x + 45,000}{180x + 63,000} = \frac{5}{9}$$

 $\Rightarrow 9 \times (90x + 45,000) = 5 \times (180x + 63,000)$

$$\Rightarrow 810x + 4,05,000 = 900x + 3,15,000$$

$$\Rightarrow 4,05,000 - 3,15,000 = 900x - 810x$$

$$\Rightarrow x = \frac{90,000}{90} = 1000$$

Amount invested by Deepak initially = $20 \times 1000 = 20,000$

Total investment of Deepak after 6 months of starting of business = $20,000 + 8000 + 5000 = 33,000$

- 98. (c):** Let Total profit = Rs. 100x

Out of total profit 20% is given to 'Bharat' and remaining is distributed between Bharat and Ekta such that total share of Bharat in profit is same total share of Ekta in profit

Ekta's share in profit = 50x

Bharat's share in profit = 50x

Ratio of investment of Bharat and Ekta = $(50x - 20x) : 50x = 3 : 5$

Let Initial investment of Ekta = Rs. 'x'

Ratio between Bharat and Ekta's profit.

$$\frac{6,000 \times 3 + (6,000 + 4,000) \times 3 + (10,000 + 6,000) \times 3 + (16,000 + 8,000) \times 2}{x \times 3 + (x + 5000) \times 3 + (x + 9000) \times 3 + (x + 11000) \times 3}$$

$$= \frac{3}{5}$$

$$\frac{1,44,000}{12x + 75,000} = \frac{3}{5}$$

$$\Rightarrow 2,40,000 = 12x + 75,000$$

$$12x = 1,65,000$$

$$\Rightarrow x = 13,750 \text{ Rs.}$$

- Sol. (99 - 103):**

Time taken by P to fill the tank alone = $\frac{24}{40} \times 100 = 60$ hours

Time taken by Q to fill the tank alone = $\frac{4.5}{12.5} \times 100 = 36$ hours

Time taken by R to fill the tank alone = $\frac{18}{25} \times 100 = 72$ hours

Time taken by S to fill the tank alone = $\frac{6}{12.5} \times 100 = 48$ hours

Time taken by T to fill the tank alone = $\frac{9}{10} \times 100 = 90$ hours

Let Capacity of tank = 720 units (LCM of time taken by all five pipes to fill tank alone)

Efficiency of P = $\frac{720}{60} = 12$ units/hours

Efficiency of Q = $\frac{720}{36} = 20$ units/hours

Efficiency of R = $\frac{720}{72} = 10$ units/hours

Efficiency of S = $\frac{720}{48} = 15$ units/hours

Efficiency of T = $\frac{720}{90} = 8$ units/hours

99. (e): ATQ—

$$(12 + 8) \times t + (10 + 15) \times (t + 2) = 720 \times \left(100 - \frac{50}{9}\right) \times \frac{1}{100}$$

$$20t + 25t + 50 = 720 \times \frac{850}{9} \times \frac{1}{100}$$

$$45t = 680 - 50$$

$$t = 630$$

$$t = 14$$

Efficiency of pipe A = $(14 + 2)$ units /hours = 16 units/hours

$$\text{Pipe A can fill the tank alone} = \frac{720}{16} = 45 \text{ hours}$$

100. (b): If Q and R start filling tank alternatively

First hour by Q = 20 units

Second hours by T = 8 units

So, in two hours = 28 units

Total tank filled by pipe Q and T in 25 hr

$$= 20 \times 13 + 8 \times 12$$

$$= 260 + 96$$

$$= 356 \text{ units}$$

Remaining portion of tank = $720 - 356 = 364$ units

Remaining portion of tank filled by pipe P and R alternatively

First hour by R = 10 units

Second hour by P = 12 units

So, in two hours = 22 units

Total tank filled by pipe P and R in 32 hours

$$= \frac{32}{2} \times 22$$

$$= 352 \text{ units}$$

Remaining portion of tank = $364 - 352 = 12$ units

In 33 hours, tank filled by R = 10 = 362 units

Remaining 2 units by P = $\frac{2}{12} = \frac{1}{6}$ hours

$$\text{Total time} = \left(32 + 1 + \frac{1}{6}\right) = 33\frac{1}{6} \text{ hours}$$

101. (d): Efficiency of pipe P and pipe S $\times y$ + Efficiency of pipe Q $\times (y - 4)$ + Efficiency of pipe T $\times (y - 10)$ = 720

$$(12 + 15)y + 20(y - 4) + 8(y - 10) = 720$$

$$27y + 20y - 80 + 8y - 80 = 720$$

$$55y = 880$$

$$y = 16 \text{ hours}$$

ATQ—

$$\text{Efficiency of } (P + S + Q + T) \times (y - 3) = (12 + 20 + 15 + 8) \times (16 - 3) = 715 \text{ units}$$

$$\text{Required portion} = \frac{5}{720} = \frac{1}{144}$$

102. (d): First 15 hours work of P and S together

$$= \left[\left(12 \times \frac{3}{4}\right) + \left(15 \times \frac{4}{3}\right)\right] \times 15$$

$$= 29 \times 15 = 435 \text{ units}$$

Remaining unfilled tank = $720 - 435 = 285$ units

Efficiency of pipe B = $\frac{285}{57} = 5$ units/hours

$$\text{Pipe B alone can complete whole work in} = \frac{720}{5} =$$

$$144 \text{ hours}$$

103. (b): ATQ—

In First hour, tank filled by P & T together = $(12 + 8) = 20$ units

In Second hour, tank filled by Q & R together = $(20 + 10) = 30$ units

In Third hour, tank filled by S = 15 units

Total tank filled in three hours = $(20 + 30 + 15) = 65$ units

In total 33 hours tank filled = $\frac{33}{3} \times 65 = 715$ units

Remaining tank filled by P & T together = $\frac{720 - 715}{20} = \frac{1}{4}$ hours

Total time = $33\frac{1}{4}$ hours

104. (c): To complete all the tasks in the minimum possible time, each of these tasks should be assigned to those who can do it in minimum possible time.

$W_3 W_1$	W_2	W_4	
↓	↓	↓	↓
D	B	A	C
5h	3h	7h	2h
required time = 17 hrs.			

105. (b): Minimum time will be obtained if

$$B \rightarrow W_1 + W_3 \rightarrow 3 + 5 \rightarrow 8 \text{ h}$$

$$C \rightarrow W_4 \rightarrow 2 \text{ h}$$

$$D \rightarrow W_2 \rightarrow 6 \text{ h}$$

So, required time will be 8 h

106. (e): There will be minimum time when

$$B \rightarrow W_1 + W_3 \rightarrow 3 + 5 \rightarrow 8 \text{ h}$$

$$C \rightarrow W_2 + W_4 \rightarrow 7 + 2 \rightarrow 9 \text{ h}$$

So, 9 h will be the required minimum time when all the tasks will be completed.

107. (d): Total capacity of tank X = $24 \times (4x + 2x + 4x) = 240x$ units

Given, B fill the tank for first 10 hours

\Rightarrow tank filled by B = $40x$ units

$$\Rightarrow \text{Time taken by C} = \frac{40x}{2x} = 20 \text{ hours}$$

\Rightarrow C and A filled the tank for 20 hours

And E fill the tank for 8 hours

$$20 \times 3x + 10 \times 4x + 20 \times 2x + p \times 4x + 8 \times 6x = 240x$$

$$\Rightarrow 188x + p \times 4x = 240x$$

$$\Rightarrow p = \frac{240x - 188x}{4x}$$

$$\Rightarrow p = \frac{52x}{4x} = 13 \text{ hours}$$

108. (b): $5x \times (T + 42) = 8x \times (T + 15)$

$$\Rightarrow 5T + 210 = 8T + 120$$

$$\Rightarrow T = 30 \text{ hours}$$

$$\text{Capacity of tank 'P'} = 5x(30 + 42) = 5x(72) = 360x \text{ units}$$

$$B \text{ fill the tank 'P' in } \frac{360x}{4x} = 90 \text{ hours}$$

109. (b): E, B, and D fill the tank for 6 hours, 9 hours and 9 hours respectively and total 60% of tank filled by them
 $\Rightarrow 60\%$ of tank = $4a \times 9 + 4a \times 9 + 6a \times 6 = 108a$ units

$$\Rightarrow \text{Total capacity of tank M} = \frac{108a}{3} \times 5 = 180a \text{ units}$$

'A' fill the tank for $(9 + x)$ hours & 'C' fills the tank for $(9 + x + d)$ hours and fill 40% of tank

$$\Rightarrow 72a = 3a(9 + x) + 2a(9 + x + d)$$

$$72 = 27 + 3x + 18 + 2x + 2d$$

$$27 = 5x + 2d \quad \dots(i)$$

And,

$$\text{Given, } d - x = 3 \quad \dots(ii)$$

On solving (i) & (ii)

$$d = 6 \text{ hours, } x = 3 \text{ hours}$$

$$\text{'A' fill tank for} = (9 + 3) = 12 \text{ hours}$$

$$\text{'C' fills the tank for } (9 + x + d) = 9 + 3 + 6 = 18 \text{ hours}$$

$$\text{Required \%} = \frac{18-12}{12} \times 100 = \frac{6}{12} \times 100 = 50\%$$

110. (b): There are two possibilities

First - D fill first

Second - E fill first

When D fill first

$$\text{Remaining tank} = 120x - 10(3x+4x) - 7(2x) = 36x \text{ units}$$

$$\text{D and E fill tank in 6 hours} = 30x \text{ units}$$

$$7^{\text{th}} \text{ hours D filled tank} = 4x \text{ units}$$

$$\text{Remaining by E in } \frac{1}{3} \text{ hours}$$

Now 'd' cannot be in fraction

2nd case-

When E filled first-

$$\text{E and D fill the tank in first 6 hours} = 30x \text{ units}$$

$$\text{Remaining tank by E} = 6x/6x = 1 \text{ hours}$$

So, E filled for 4 hours.

111. (d): In first case

ATQ,

$$\frac{10}{40} + \frac{5}{30} + \frac{t}{60} + \frac{5}{30} + \frac{6}{20} = 1$$

$$\Rightarrow \frac{t}{60} + \frac{53}{60} = 1 \Rightarrow \frac{t}{60} = \frac{7}{60}$$

$$\Rightarrow t = 7 \text{ hours}$$

In second case

ATQ,

$$\frac{4}{40} + \frac{4}{30} + \frac{d}{60} + \frac{8}{30} + \frac{5}{20} = 1$$

$$\Rightarrow \frac{d}{60} + \frac{3}{4} = 1 \Rightarrow \frac{d}{60} = \frac{1}{4}$$

$$\Rightarrow d = 15 \text{ hours}$$

$$(d - t) = (15 - 7) = 8 \text{ hours}$$

Sol (112 - 116)

Let total work units be 360 units.

112. (b): Total work = 360 units.

$$\text{A efficiency} = \frac{360}{15} = 24 \text{ units/d}$$

$$\text{B efficiency} = \frac{360}{18} = 20 \text{ units/d}$$

$$\text{D efficiency} = \frac{360}{30} = 12 \text{ units/d}$$

Given —

$$\frac{24X}{32(X+2\frac{1}{2})} = \frac{1}{2} \Rightarrow \frac{3X}{4(X+\frac{5}{2})} = \frac{1}{2} \Rightarrow \frac{3X}{4x+10} = \frac{1}{2}$$

$$6X - 4X = 10$$

$$X = 5 \text{ days}$$

A worked for 5 days.

113. (c): A efficiency = $\frac{360}{15} = 24 \text{ units/d}$

$$\text{A new efficiency} = 24 \times \frac{50}{100} = 12 \text{ units/d}$$

$$\text{D efficiency} = \frac{360}{30} = 12 \text{ units/d}$$

$$\text{Days taken by (A + D)} = \frac{360}{(12+12)} = 15 \text{ days}$$

$$\text{C work's unit} = 360 \times \frac{62.5}{100} = 225$$

$$\text{C efficiency} = \frac{360}{24} = 15 \text{ units/d}$$

$$\text{C New efficiency} = 15 \times \frac{66\frac{2}{3}}{100} + 15$$

$$= 15 \times \frac{200}{100} + 15$$

$$= 25 \text{ units/d}$$

$$\text{Days taken by C} = \frac{225}{25} = 9 \text{ days}$$

$$\text{Ratio} = \frac{C}{A+D} = \frac{9}{15} = \frac{3}{5} = 3 : 5$$

114. (a): D efficiency = $\frac{360}{30} = 12 \text{ units/d}$

$$\text{C efficiency} = \frac{360}{24} = 15 \text{ units/d}$$

$$\text{E efficiency} = \frac{360}{10} = 36 \text{ units/d}$$

According to question —

$$Y = \frac{200}{100} X$$

$$Y = 2X$$

$$= 12X + 15(2X) + 36 \times 3 = 360$$

$$= 12X + 30X = 252$$

$$= X = \frac{252}{42} = 6 \text{ days}$$

$$\text{D work for} = 6 \text{ days}$$

$$\text{C work for} = 6 \times 2 = 12 \text{ days}$$

115. (c): New efficiency of C, D and E

New efficiency of C

$$= \frac{360}{24} + \frac{360}{24} \times \frac{200}{3} \times \frac{1}{100}$$

$$= 15 + 10 = 25 \text{ units/d}$$

New efficiency of D

$$= \frac{360}{30} \times \frac{75}{100} = 9 \text{ units/d}$$

E new efficiency

$$= \frac{360}{10} \times \frac{1}{2}$$

$$= 18 \text{ units/d}$$

$$1^{\text{st}} \text{ day work done by C} = 25 \text{ units}$$

$$2^{\text{nd}} \text{ day work done by D} = 9 \text{ units}$$

$$3^{\text{rd}} \text{ day work done by E} = 18 \text{ units}$$

$$\text{Total work in 3 days} = (25 + 9 + 18) = 52 \text{ units}$$

Now

$$= 52 \times 6 = 312 \text{ units in } (6 \times 3) = 18 \text{ days}$$

$$19^{\text{th}} \text{ day by C} = 25$$

$$20^{\text{th}} \text{ days by D} = 9$$

After 20th days remaining work

$$= 360 - (312 + 25 + 9)$$

$$= 360 - 346 = 14 \text{ units}$$

$$21^{\text{th}} \text{ days by E} = \frac{14}{18} = \frac{7}{9}$$

$$\text{Total days} = 20 + \frac{7}{9}$$

$$= 20\frac{7}{9} \text{ days}$$

116. (a): New efficiency of B

$$= \frac{360}{18} \times \frac{75}{100} = 15 \text{ units /d}$$

$$\text{New efficiency of D} = \frac{360}{30} \times \frac{125}{100} = 15 \text{ units /d}$$

$$\text{efficiency of F} = \frac{360}{12} = 30 \text{ units /d}$$

Days taken by three together

$$(B + D + F) = \frac{360}{(15+15+30)} = 6 \text{ days}$$

$$B \text{ wage} = 27180 \times \frac{15 \times 6}{360}$$

$$= 75.5 \times 90 = 6795 \text{ Rs.}$$

$$D \text{ wage} = 27180 \times \frac{15 \times 6}{360}$$

$$= 75.5 \times 90 = 6795 \text{ Rs.}$$

$$F \text{ wage} = 27180 \times \frac{30 \times 6}{360} = 13590 \text{ Rs.}$$

117. (a): Given, rate offered by IDBI : rate offered by UCO
= 3 : 4

$$\text{Rate offered by UCO bank} = \frac{6}{3} \times 4 = 8\%$$

Principle invested in UCO bank

$$2 \text{ year CI on } 8\% = 8 + 8 + \frac{8 \times 8}{100} = 16.64\%$$

$$\text{Principle} = \frac{29160}{116.64} \times 100 = 25000 \text{ Rs}$$

$$\text{Amount obtained from IDBI} = \frac{10000 \times 2 \times 6}{100} + 10000$$

$$= 1200 + 10000 = 11200$$

$$\text{Required difference} = 25000 - 11200 = 13800 \text{ Rs.}$$

118. (c): Rate = 10%

According to question

$$\text{Principle invested in SBI} = \frac{26250}{100+4 \times 10} \times 100$$

$$= 18750 \text{ Rs.}$$

Amounts obtained from Yes bank

$$3 \text{ years CI on } 10\% = 33.1\%$$

$$= 20000 \times \frac{133.1}{100} = 26620 \text{ Rs.}$$

$$\text{Required}\% = \frac{18750}{26620} \times 100 = 70.435\%$$

119. (b): Principle invested in ICICI = $\frac{20000}{5} \times 7$

$$= 28000 \text{ Rs}$$

$$\text{Time} = (3 - 1) = 2 \text{ year}$$

$$2 \text{ year CI on } 15\% = 15 + 15 + \frac{15 \times 15}{100} = 32.25\%$$

$$\text{Required interest} = 28000 \times \frac{32.25}{100} = 9030 \text{ Rs.}$$

120. (d): Let principle invested in UCO is X Rs. and principle invested in ICICI is (x + 3000) Rs

According to question

$$2 \text{ year CI on } 15\% = 15 + 15 + \frac{15 \times 15}{100} = 32.25\%$$

$$2 \text{ year CI on } 8\% = 8 + 8 + \frac{8 \times 8}{100} = 16.64\%$$

$$\frac{132.25(X+3000)}{100} - \frac{16.64x}{100} = 32870$$

$$115.61X = 3287000 - 396750$$

$$115.61x = 2890250$$

$$X = \frac{2890250}{115.61} = 25000 \text{ Rs.}$$

$$\text{Principle invested in ICICI} = 25000 + 3000 = 28000 \text{ Rs.}$$

121. (c): Rate offered by SBI = $\frac{6}{3} \times 5 = 10\%$

$$\text{Time} = \frac{4}{2} \times 1 = 2 \text{ year}$$

$$\text{Principle invested in SBI} = \frac{26250}{100+(10 \times 4)} \times 100$$

$$= 18750 \text{ Rs.}$$

$$\text{Amount obtained from IDBI} = 10000 \times \frac{100+(2 \times 6)}{100}$$

$$= 10000 \times \frac{112}{100} = 11200 \text{ Rs.}$$

$$\text{Required sum} = 11200 + 18750 = 29950 \text{ Rs.}$$

122. (b): Relative speed of train A and Man

$$= \frac{750}{60} \times \frac{5}{18} + 10 \times \frac{5}{18} = 12.5 + \frac{50}{18} = \frac{275}{18} \text{ m/s}$$

$$\text{Distance in } 9\frac{9}{11} \text{ sec} = \frac{275}{18} \times \frac{108}{11} = 150 \text{ m}$$

$$\text{Length of train A} = 150 \text{ m}$$

$$\text{Distance in } 24 \text{ sec} = 24 \times 12.5 = 300 \text{ m}$$

$$\text{Length of platform} = 300 - 150 = 150 \text{ m}$$

123. (c): Let length of train C and train F be 3L and 5L respectively

Relative speed of train C to train F

$$= \frac{2000}{3 \times 60} \times \frac{18}{5} + \frac{1000}{60} \times \frac{18}{5} = 40 + 60 = 100 \text{ km/hr}$$

$$= 100 \times \frac{5}{18} = \frac{500}{18} \text{ m/s}$$

According to question

$$\frac{500}{18} = \frac{3L+5L}{14.4}$$

$$L = 50 \text{ m}$$

Length of train C and F

$$C = 3 \times 50 = 150 \text{ m}$$

$$F = 5 \times 50 = 250 \text{ m}$$

$$T = \frac{150+(150+50)}{\frac{2000}{3 \times 60}} = \frac{350 \times 3 \times 60}{2000} = \frac{63}{2} \text{ sec}$$

124. (a): According to question

$$\text{Speed of train B} = \frac{180+180}{21.6} \times \frac{18}{5}$$

$$= 60 \text{ km/hr}$$

Speed of train E in km/hr

$$E \text{ speed} = \frac{300+300}{30} \times \frac{18}{5} = \frac{600}{30} \times \frac{18}{5} = 72 \text{ km/hr}$$

Relative speed of train E and B when running in same direction

$$= 72 - 60 \times \frac{5}{18} = \frac{12 \times 5}{18} = \frac{10}{3} \text{ m/s}$$

Time taken by faster train to cross slower train

$$= \frac{(180+300) \times 3}{10} = \frac{480 \times 3}{10} = 144 \text{ sec}$$

125. (a): Given,Speed (m/s) : Taken time = $8x : 5x$

$$8x = \frac{120+240}{5x}$$

$$40x^2 = 360$$

$$x = \sqrt{\frac{360}{40}} = 3$$

Speed of train D = $8 \times 3 = 24$ m/sTaken time = $5 \times 3 = 15$ sec

$$\text{Required ratio} = \frac{\frac{120+600}{24}}{\frac{(200+600) \times 60}{1000}} = 5 : 8$$

126. (b): Given,

Speed of smaller train D = 54 km/hr

Speed of train B = V km/hrRelative speed = $(V - 54)$ km/hr

To cross the man, who sits in smaller train D, train B have to cross its own length with relative speed

$$= (V - 54) \times \frac{5}{18} = \frac{180}{24}$$

 $V = 81$ km/hr

$$\text{Required speed} = 81 \times \frac{5}{18} = \frac{45}{2} \text{ m/s}$$

127. (b): Usual speed of car D in km/hr = $\frac{900}{60} \times \frac{18}{5}$

$$= \frac{15 \times 18}{5} = 54 \text{ km/hr}$$

Let total distance b/w Delhi and Lucknow is $2D$ km

According to question

$$\frac{D}{54} + \frac{D}{36} = 10 \Rightarrow \frac{D}{3} + \frac{D}{2} = 180 \Rightarrow D = \frac{1080}{5} \text{ km}$$

 $D = 216$ km $2D = 432$ km**128. (a):** Car C speed in km/hr

$$= \frac{1500}{60} \times \frac{18}{5}$$

$$= 25 \times \frac{18}{5}$$

$$= 90 \text{ km/hr}$$

Car A speed in km/hr

$$= \frac{750}{60} \times \frac{18}{5}$$

$$= 45 \text{ km/hr}$$

Let both Car has travelled for t hours before they meet.

According to question

$$90t - 45t = 180$$

$$t = \frac{180}{45} = 4 \text{ hours.}$$

Therefore, total distance traveled is $(90 \times 4) + (45 \times 4) = 540$ km.**129. (d):** Speed of car B = $\frac{1800}{60} \times \frac{18}{5} = 108$ km/hr

$$\text{Speed of car C} = \frac{1500}{60} \times \frac{18}{5} = 90 \text{ km/hr}$$

Average speed of Rajeev whole journey

$$= \frac{2xy}{x+y} = \frac{2 \times 108 \times 90}{108+90} = \frac{19440}{198} \text{ km/hr}$$

Required distance = speed \times time

$$= \frac{19440}{198} \times 11 = 1080 \text{ km}$$

Distance between city and village

$$= \frac{1080}{2} = 540 \text{ km}$$

130. (c): Car E usual speed = $\frac{1200}{60} \times \frac{18}{5} = 72$ km/hr

Time taken from this speed is 480 minutes, i.e. 8 hours.

Hence total distance b/w City X & Y is $8 \times 72 = 576$ kmReduce speed = $72 - 12 = 60$ km/hr

$$\text{Required time} = \frac{576}{60} = \frac{48}{5} \text{ hours or } 576 \text{ minutes}$$

131. (a): Time = t = time after which they meet

$$\text{Speed of car E} = \frac{1200}{60} \times \frac{18}{5} = 72 \text{ km/hr}$$

$$\text{Speed of car C} = \frac{1500}{60} \times \frac{18}{5} = 90 \text{ km/hr}$$

$$= 72 \left(t - \frac{2}{3} \right) + 90t = 762$$

$$= 72t - 48 + 90t = 762 \Rightarrow t = \frac{762+48}{162}$$

$$t = 5 \text{ hr}$$

Both cars meet at = $3.20 + 5 = 8.20$ pm

$$\text{Distance from Delhi} = \left(5 - \frac{2}{3} \right) \times 72 = 312 \text{ km}$$

Sol. (132 - 133):

From Bar graph

Total male employee in A = 50

So, total female employee in B = $50 \times \frac{160}{100} = 80$ And, total female employee in C = $80 \times \frac{75}{100} = 60$ Let there are x female employee in company A

$$\frac{50}{50+x} = \frac{5}{12}$$

 $x = 70$ (female employee in company A)let there are y & z male employee in company B & company C respectively

$$\frac{y+z}{50+y+z} = \frac{14}{19}$$

$$y + z = 140 \quad \dots(i)$$

$$\frac{y}{y+80} = \frac{z}{z+60}$$

$$yz + 60y = yz + 80z$$

$$y : z = 4 : 3 \quad \dots(ii)$$

using (i) & (ii)

$$y = 80, \quad z = 60$$

	A	B	C
Male employee	50	80	60
Female employee	70	80	60

132. (a): Male employees in company C = 60**133. (d):** Total employee in B = $80 + 80 = 160$ Total employee in A = $50 + 70 = 120$

$$\text{Required percentage} = \frac{160-120}{120} \times 100 = 33\frac{1}{3} \%$$

Sol. (134-136)

$$\text{Investment of A} = \frac{10}{100} \times 15000 = 1500$$

$$\text{Investment of B} = \frac{25}{100} \times 15000 = 3750$$

$$\text{Investment of C} = \frac{20}{100} \times 15000 = 3000$$

$$\text{Investment of D} = \frac{15}{100} \times 15000 = 2250$$

$$\text{Investment of E} = \frac{30}{100} \times 15000 = 4500$$

134. (d): Ratio of profit of A to C
 $= 1500 \times 4 + (1500 - 800) \times 8 : 3000 \times 6 + (3000 + 1200) \times 6$
 $= 11600 : 43200 = 29 : 108$
 Profit of A = $\frac{2700}{108} \times 29 = \text{Rs } 725$

135. (a): Investment of F = $4500 + 500 = 5000$
 Ratio of profit of E, B and F respectively = $6 \times 4500 : 3750 \times 8 : 5000 \times 12$
 $= 9 : 10 : 20$
 Required profit = $\frac{2900}{29} \times 39 = \text{Rs } 3900$

136. (b): Ratio of profit D, X & Y respectively = $3 \times 4 : x \times 3 : 5 \times 2$
 $= 12 : 3x : 10$
 Let profit of D & Y be $12p$ & $10p$ respectively.
 Given, $22p = 6600$
 $p = 300$
 $3x \times 300 + 6600 = 9300$
 $\therefore x = 3$
 \therefore Amount invested by X = investment of D = 2250 Rs.

137. (d): Total balls in bag A = $200 \times \frac{20}{100} = 40$
 Total balls in bag C = $200 \times \frac{22.5}{100} = 45$
 Difference between white and red balls in bag A = $50 \times \frac{20}{100} = 10$
 Difference between white and red balls in bag C = $50 \times \frac{10}{100} = 5$
 Let total number of red balls in bag A = x
 So, total number of white balls in bag A = $(40 - x)$
 And let total number of red balls in bag C = y
 Total number of white ball in bag C = $(45 - y)$
 Given, $(40 - x) - x = 10$
 $2x = 30$
 $x = 15$
 Similarly, $(45 - y) - y = 5$
 $2y = 40 \Rightarrow y = 20$
 Required probability = $\frac{25}{40} \times \frac{25}{45} = \frac{25}{72}$

138. (b): All five balls from each bag B & D chosen randomly should be white balls and number of red balls should be greater than number of white balls in order to maximize the probability of red balls in remaining balls in the bag.
 Total number of balls in bag B = $200 \times \frac{15}{100} = 30$
 Total number of balls in bag D = $200 \times \frac{25}{100} = 50$
 Difference between white balls and red balls in bag B = $50 \times \frac{20}{100} = 10$
 Difference between white balls and red balls in bag D = $50 \times \frac{20}{100} = 10$

Let total number of white balls in bag B = a
 So, total number of red balls in bag B = $(30 - a)$
 Let total number of white balls in bag D = b
 So, total number of red balls in bag D = $(50 - b)$
 ATQ,
 $(30 - a) - a = 10$
 $a = 10$
 Also, $(50 - b) - b = 10$
 $b = 20$
 Required probability = $\frac{20}{25} \times \frac{30}{45} = \frac{8}{15}$

139. (a): Total balls in bag E = $200 \times \frac{17.5}{100} = 35$
 Difference between white and red balls in bag E = $50 \times \frac{30}{100} = 15$
 Let number of red balls in bag E = p
 So, number of white balls in bag E = $(35 - p)$
 Given, $(35 - p) - p = 15$
 $p = 10$
 Number of white balls in bag F = $(35 - 10) - 5 = 20$
 And number of red balls in bag F = 10
 Required probability = $\frac{20 \times 10}{{}^{30}C_2} = \frac{40}{87}$

140. (d): Total number of balls in bag A = $200 \times \frac{20}{100} = 40$
 Difference between white balls and red balls in bag A = $50 \times \frac{20}{100} = 10$
 Let total number of red balls in bag A = x
 So, total number of white balls in A = $(40 - x)$
 ATQ,
 $(40 - x) - x = 10$
 $2x = 30$
 $x = 15$
 Let total number of rotten white balls in bag A = a
 And let, total number of rotten red balls in bag A = $2a$
 Now,
 $\frac{{}^{(25-a)}C_2 + {}^{(15-2a)}C_2}{{}^{(40-3a)}C_2} = \frac{11}{18}$
 $a = 4$
 Required difference = $2a - a = a = 4$

141. (c): Work Y = 360 units
 Efficiency of $(P + Q + R) = \left(\frac{27}{2}\right)$ units/day
 Efficiency of R = $\frac{27}{2} - \frac{360}{30} = \frac{3}{2}$ units/day
 Efficiency of S = $\frac{360}{40} = 9$ units/day
 Efficiency of $(R + S) = \frac{3}{2} + 9 = \frac{21}{2}$ units/day
 Time taken by R & S together to complete work Y = $\frac{360 \times 2}{21} = \frac{240}{7}$ days
Work Z = 120 units
 Efficiency of $(P + Q + R) = \frac{13}{2}$ units/day

$$\text{Efficiency of Q} = \frac{13}{2} - \frac{120}{30} = \frac{5}{2} \text{ units/day}$$

$$\text{Efficiency of R} = \frac{13}{2} - \frac{120}{20} = \frac{1}{2} \text{ units/day}$$

$$\text{Efficiency of S} = \frac{120}{24} = 5 \text{ units/day}$$

$$\text{Time taken by Q, R \& S to complete the work Z together} = \frac{120}{2.5 + .5 + 5} = 15 \text{ days}$$

$$\text{Required ratio} = \frac{240}{15} = 16 : 7$$

142. (d): Work X = 120 units

$$\text{Efficiency of (P + Q + R)} = \frac{15}{2} \text{ units/day}$$

$$\text{Efficiency of R} = \frac{15}{2} - \frac{120}{20} = \frac{3}{2} \text{ units/day}$$

$$\text{Efficiency of S} = \frac{120}{40} = 3 \text{ units/day}$$

$$\text{Time taken by R \& S together to complete work X} = \frac{120}{1.5 + 3} = 26 \frac{2}{3} \text{ days}$$

Work Z = 120 units

$$\text{Efficiency of (P + Q + R)} = \frac{13}{2} \text{ units/day}$$

$$\text{Efficiency of P} = \frac{13}{2} - \frac{120}{40} = \frac{7}{2} \text{ units/day}$$

$$\text{Efficiency of S} = \frac{120}{24} = 5 \text{ units/day}$$

$$\text{Time taken by S \& P to complete work Z} = \frac{120}{3.5 + 5} = 14 \frac{2}{17} \text{ days}$$

$$\text{Required difference} = \frac{80}{3} - \frac{240}{17} = 12 \frac{28}{51} \text{ days}$$

143. (c): Total work W = 240 units (LCM of time taken by P & Q together, Q & R together, P & R together and S alone for work W)

$$\text{Efficiency of (P + Q)} = \frac{240}{24} = 10 \text{ units/day}$$

$$\text{Efficiency of (Q + R)} = \frac{240}{20} = 12 \text{ units/day}$$

$$\text{Efficiency of (P + R)} = \frac{240}{48} = 5 \text{ units/day}$$

$$\text{Efficiency of S} = \frac{240}{40} = 6 \text{ units/day}$$

$$\text{Efficiency of (P + Q + R)} = \frac{(10 + 12 + 5)}{2} = 13.5 \text{ units/day}$$

$$\text{Efficiency of R} = 13.5 - 10 = 3.5 \text{ units/day}$$

$$\text{Efficiency of P} = 13.5 - 12 = 1.5 \text{ units/day}$$

$$\text{Efficiency of Q} = 13.5 - 5 = 8.5 \text{ units/day}$$

ATQ -

$$\begin{aligned} \text{Total work W complete by (P + R) \& (R + Q)} &= 8 \\ &\times (1.5 + 3.5) + 12 \times (3.5 + 8.5) \\ &= 40 + 144 \\ &= 184 \text{ units} \end{aligned}$$

$$\text{Remaining work} = (240 - 184) = 56 \text{ units}$$

Time taken by (S + R) to complete remaining work

$$\begin{aligned} W &= \frac{56}{(6 + 3.5)} \\ &= 5 \frac{17}{19} \text{ days} \end{aligned}$$

144. (a): Total work X = 120 units (LCM of time taken by P & Q together, Q & R together, P & R together and S alone for work W)

$$\text{Efficiency of (P + Q)} = \frac{120}{20} = 6 \text{ units/day}$$

$$\text{Efficiency of (Q + R)} = \frac{120}{24} = 5 \text{ units/day}$$

$$\text{Efficiency of (P + R)} = \frac{120}{30} = 4 \text{ units/day}$$

$$\text{Efficiency of S} = \frac{120}{40} = 3 \text{ units/day}$$

$$\text{Efficiency of (P + Q + R)} = \frac{6 + 5 + 4}{2} = 7.5 \text{ units/day}$$

$$\text{Efficiency of R} = 7.5 - 6 = 1.5 \text{ units/day}$$

$$\text{Efficiency of P} = 7.5 - 5 = 2.5 \text{ units/day}$$

$$\text{Efficiency of Q} = 7.5 - 4 = 3.5 \text{ units/day}$$

ATQ -

$$\begin{aligned} &= (P \times 12 + Q \times 12) + (Q \times 8 + R \times 8) \\ &= (2.5 \times 12 + 3.5 \times 12) + (3.5 \times 8 + 1.5 \times 8) \\ &= 112 \text{ units} \end{aligned}$$

$$\text{Remaining work} = 120 - 112 = 8 \text{ units}$$

$$\begin{aligned} \text{Time taken by S to complete remaining work} &= \frac{8}{3} = 2 \frac{2}{3} \text{ days} \end{aligned}$$

145. (d): Total work W = 240 units (LCM of time taken by P & Q together, Q & R together, P & R together and S alone for work W)

$$\text{Work D} = 240 \times \frac{300}{100} = 720 \text{ units}$$

$$\text{Efficiency of (P + Q)} = \frac{240}{24} = 10 \text{ units/day}$$

$$\text{Efficiency of (Q + R)} = \frac{240}{20} = 12 \text{ units/day}$$

$$\text{Efficiency of (P + R)} = \frac{240}{48} = 5 \text{ units/day}$$

$$\text{Efficiency of S} = \frac{240}{40} = 6 \text{ units/day}$$

$$\text{Efficiency of (P + Q + R)} = \frac{(10 + 12 + 5)}{2} = 13.5 \text{ units/day}$$

$$\text{Efficiency of R} = 13.5 - 10 = 3.5 \text{ units/day}$$

$$\text{R new efficiency} = 3.5 \times \frac{400}{100} = 14 \text{ units/day}$$

$$\text{Efficiency of P} = 13.5 - 12 = 1.5 \text{ units/day}$$

$$\text{Efficiency of Q} = 13.5 - 5 = 8.5 \text{ units/day}$$

$$\text{Efficiency of S} = \frac{240}{40} = 6 \text{ units/day}$$

$$\begin{aligned} \text{Total one day work of P, Q, R \& S} &= (1.5 + 8.5 + 6) \\ &= 30 \text{ units/day} \end{aligned}$$

$$\text{Required days} = \frac{720}{30} = 24 \text{ days}$$

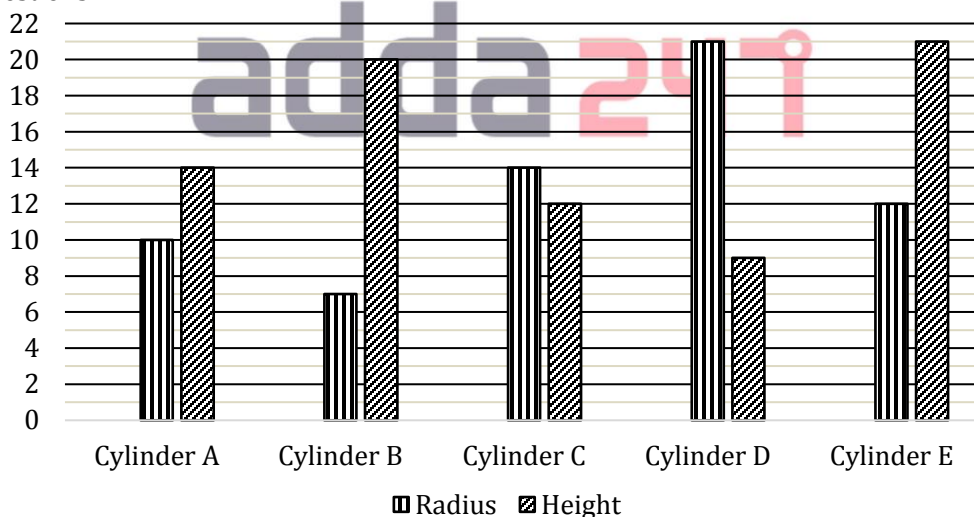
Previous Years' Questions of Mains

Directions (1-6): The table given below shows the data regarding four different articles sold by two different shops A and B. Study the data carefully and answer the questions that follow.

Article	Cost of article	Profit% of store A	Profit% of store B
Article I	200	23%	13.6%
Article II	420	20%	35%
Article III	480	24%	5%
Article IV	320	10%	20%

- Average selling price of article II for Store A, B and C is Rs 441. If cost price of article II for Store C is also same as Store A and B, then find the loss% of Store C after selling Article II?
(a) 44% (b) 32% (c) 25% (d) 40% (e) 55%
- If mark price labeled on article I for Store A and Store B is 64% and 42% above its Cost Price, then find the difference between discount offered by store A and Store B.
(a) Rs. 11.6 (b) Rs. 19.6 (c) Rs. 27.8 (d) Rs. 21.4 (e) Rs.25.2
- Cost Price of article V is 25% more than that of article IV. If ratio of selling price of article V sold by store B and selling price of article IV by same store is 21: 16, then find profit% of store B by selling article V?
(a) 11% (b) 19% (c) 26% (d) 21% (e) 29%
- Selling price of article III sold by store A is approx. what percent more than same article sold by store B?
(a) 21% (b) 18% (c) 16% (d) 11% (e) 9%
- Selling price of article III for store A is what % less than selling price of article IV for store B (approx.)?
(a) 14% (b) 46% (c) 35% (d) 71% (e) 28%
- What is the ratio between cost price of article II for store A and selling price of article I for store B?
(a) None of these (b) 229:319 (c) 316:229 (d) 284:525 (e) 525:284

Direction (7 – 12): Bar graph show radius (in cm) and height (in cm) of five different cylinders. Read the data carefully and answer the questions.



- If some cubes having side of 2 cm is filled in cylinder A and cylinder B, then find the difference between number such cubes filled in both cylinders?
(a) 155 (b) 165 (c) 145 (d) 175 (e) 135
- If cylinder C is 40% filled with water and cylinder D is 80% filled with water, then find the difference between empty volumes of both cylinders (cm^3)?
(a) 1948.4 (b) 1904.4 (c) 1930.4 (d) 1924.4 (e) 1940.4

9. Difference between diameter and height of cylinder A is what percent more or less than difference between diameter and height of cylinder C?
 (a) 67.5% (b) 50% (c) 62.5% (d) 75% (e) 87.5%
10. Find the ratio of curved surface area of cylinder D to that of cylinder A?
 (a) 27 : 20 (b) 9 : 7 (c) 8 : 5 (d) 21 : 16 (e) 6 : 5
11. Find the sum of total surface area of cylinder B to that of cylinder E (in cm^2)?
 (a) $\frac{25440}{7}$ (b) $\frac{25740}{7}$ (c) $\frac{25540}{7}$ (d) $\frac{25840}{7}$ (e) $\frac{25640}{7}$
12. Find the average of volume of cylinder C, D & E (in cm^3)?
 (a) 9740 (b) 9730 (c) 9750 (d) 9790 (e) 9760

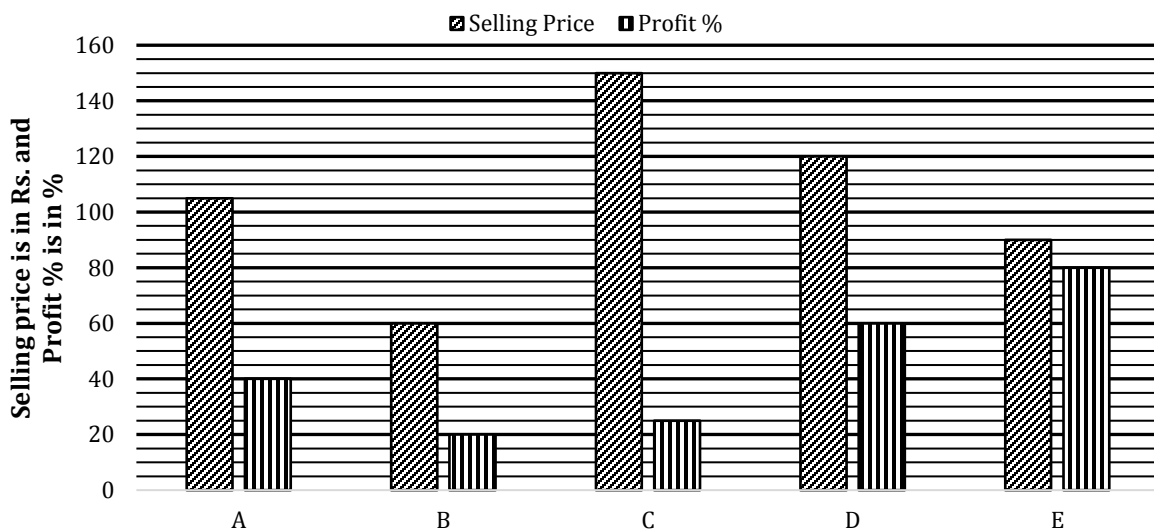
Directions (13-15): Table given below shows number of employees required for three different video courses of Adda247 to be completed in various days in two different cases read the data carefully and answer the questions.

Video courses	Case 1		Case 2	
	Number of employees	Required days	Number of workers	Days required
Mars	A	88	A + 8	66
Jupiter	B	B - 1	B + 6	B - 6
Pluto	N^2	75	X^2	108

Note : Efficiency of all employees are equal

13. If a new team working on Pluto video course and total number of employees in this team is $(\frac{N}{2} \times 2X)$, then in how many days this video course will be completed by this team?
 (a) 75 days (b) 60 days (c) 90 days (d) 80 days (e) None of these
14. If sixty-four employees were working on Mars video course, then how many days did it take to complete this video course?
 (a) 44 days (b) 22 days (c) 33 days (d) 36 days (e) None of these
15. If $\frac{B}{2}$ employee work on Jupiter video course for ten days and then same number of employees joined the project, then how many days will it take to complete this video course?
 (a) 35 days (b) 40 days (c) 45 days (d) 50 days (e) None of these

Directions (16-20): - Bar chart given below shows selling price of five articles and profit % earned on selling these articles by Ravi. Study the data carefully & answer the following questions.

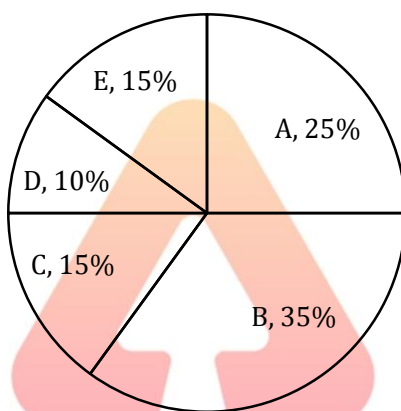


16. Ravi sold article 'D' to Shyam who again sold it at 25% profit. Find the difference between profit earned by Ravi to profit earned by Shyam.
 (a) Rs. 5 (b) Rs. 10 (c) Rs. 15 (d) Rs. 20 (e) Rs. 25

17. Cost price of article 'A' is what percent more/less than cost price of article 'C'.
 (a) 62.5% (b) 37.5% (c) 25% (d) 75% (e) 50%
18. Ravi marked article B, 50% above its cost price, then what percent discount should be given on marked price to earn the given profit?
 (a) 40% (b) 30% (c) 25% (d) 20% (e) 10%
19. Profit earned on selling article 'E' is how much more/less than profit earned on selling article 'C'.
 (a) Rs.40 (b) None of the given options (c) Rs.30
 (d) Rs.20 (e) Rs.10
20. Ravi mark-up article 'A' such that on selling article 'A' at 16% discount he will earn the given profit. Mark up price of article 'A' is what percent more than its cost price?
 (a) $33\frac{1}{3}\%$ (b) $66\frac{2}{3}\%$ (c) $16\frac{2}{3}\%$ (d) $26\frac{2}{3}\%$ (e) $73\frac{1}{3}\%$

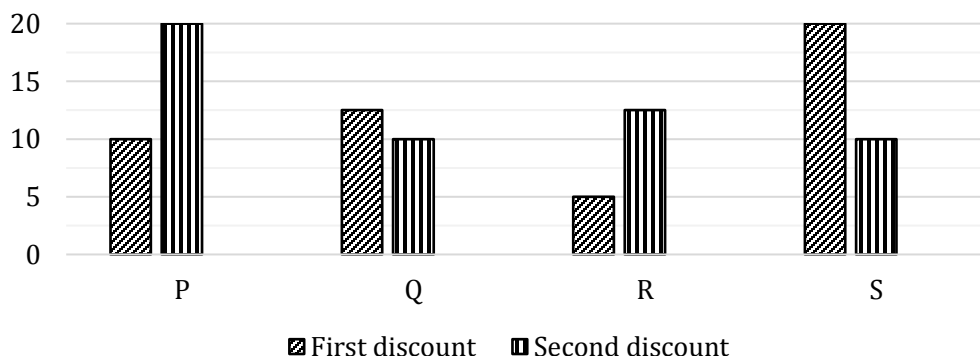
Directions (21-23): Pie-chart given below shows investment (in terms of percentage) out of total investment of five different persons. Study the questions carefully and answer them.

Total Investment = Rs 80,000



21. B and E started a business together. B left the business 9 months after starting of business. Find the difference between profit shares of B and E if total annual profit is Rs. 15,400?
 (a) Rs.2100 (b) Rs.4200 (c) Rs.1400 (d) Rs.2800 (e) Rs.3500
22. A and D started a business together after 6 months 'A' is replaced by 'C'. D left the business after 2 months of 'A' while 'C' worked for total 'x' months. Out of total profit of Rs 13,050, 'A' got Rs 6750, then find the value of 'x'.
 (a) 10 (b) 8 (c) 6 (d) 4 (e) 2
23. 'A', 'F' and 'C' started a business together. F invested Rs. 4000 more than amount invested by C. F left the business after 6 months of starting of business. After 2 months more, 'C' left the business. Out of annual profit if A and C together got Rs 8750 then find total annual profit got by all three together?
 (a) Rs 11,250 (b) Rs 10,000 (c) Rs 12,500 (d) Rs 13,750 (e) Rs 15,000

Direction (24 - 28): Bar graph given below shows two successive discounts allowed on four different articles. Read the data carefully and answer the questions.



24. If ratio of marked price of P to that of Q is 5 : 6 and difference between selling price of both articles is Rs. 450, then find difference between marked price of article P & Q?
 (a) 360 Rs. (b) 500 Rs. (c) 440 Rs. (d) 400 Rs. (e) 480 Rs.
25. Marked price of S is 25% less than that of P and sum of selling price of both articles is Rs. 2520 and loss on S is 10% & profit on P is 20%. Find ratio of cost price of S to that of P ?
 (a) 1 : 1 (b) 1 : 2 (c) 1 : 3 (d) 2 : 3 (e) 2 : 5
26. If ratio of selling price of Q to that of S is 7 : 4, then find ratio of marked price of S to that of Q?
 (a) 6 : 5 (b) 7 : 5 (c) 5 : 7 (d) 5 : 8 (e) 9 : 5
27. If second discount allowed on P is increased by 25%, then the selling price of article will be decreased by Rs. 90 and selling price of R is Rs. 110 less than that of P, then find marked price of article R?
 (a) 1600 Rs. (b) 1200 Rs. (c) 1800 Rs. (d) 2000 Rs. (e) 2400 Rs.
28. Ratio of selling price of P to that of S is 4 : 3 and sum of marked price of both articles is Rs. 7000. Find difference between selling price of both articles?
 (a) 640 Rs. (b) 840 Rs. (c) 720 Rs. (d) 480 Rs. (e) 240 Rs.

Directions (29 – 30): Given below is no. of male & female students in classes A, B & C. some data are missing which you have to calculate as per instructions provided.

	A	B	C
Boys	50	--	--
Girls	--	80	60

NOTE:

- (i) probability of selecting a boy from class A is $\frac{5}{12}$.
- (ii) probability of selecting a boy from all the boys of all classes is $\frac{14}{19}$ such that the boy selected is either from class B or class C.
- (iii) probability of selecting a boy from class B is equal to probability of selecting a boy from class C.

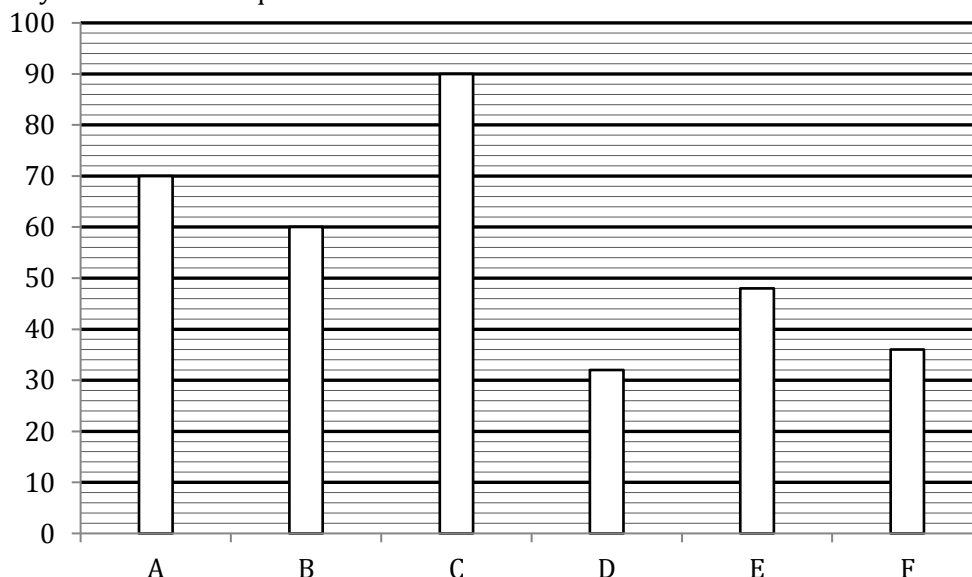
29. how many boys are in class C?

- (a) 60 (b) 50 (c) 70 (d) 80 (e) 90

30. By what percent total students in class B are more than that of in class A?

- (a) $16\frac{2}{3}\%$ (b) $37\frac{1}{2}\%$ (c) 25% (d) $33\frac{1}{3}\%$ (e) None of these

Direction (31- 35): Given below bar graph show number of hours taken by six persons to complete a task individually. Read the data carefully and answer the questions:



31. A, C and D start working together but due to bad health of A and D their efficiency decreased by $12\frac{1}{2}\%$ and $33\frac{1}{3}\%$ respectively. Then find in how many hours total task will be completed by these three?
 (a) $22\frac{1}{2}$ hours (b) $10\frac{1}{4}$ hours (c) $12\frac{1}{4}$ hours (d) $9\frac{1}{4}$ hours (e) $13\frac{1}{4}$ hours
32. E and F start working together on another task, while F work with 25% less efficiency. E and F work for y hours and remaining work complete by B in (y + 1) hours, if ratio of work done by E and F together and by B alone is 2 : 1, then in how many hours A will complete same task alone?
 (a) $15\frac{1}{2}$ hours (b) $13\frac{1}{2}$ hours (c) $17\frac{1}{2}$ hours (d) $11\frac{1}{2}$ hours (e) $9\frac{1}{2}$ hours
33. If G can do 50 % more work in one hour as A can do in one hour, while H can do 25% less work in one hour as B can do in one hour. C start working alone and after some time he left the task, if remaining task complete by G & H together in 23.5 hours more than C work alone. Then find total time in which work completed?
 (a) 32.5 hours (b) 30.5 hours (c) 28.5 hours (d) 22.5 hours (e) 16.5 hours
34. A, B, E and F work together in first hour, while C & D together destroy the task (with same efficiency of completing the task) in second hour. If this rotation continue till the total work is completed. Find how many hours required to complete the task?
 (a) $55\frac{17}{25}$ hours (b) $45\frac{17}{25}$ hours (c) $40\frac{177}{245}$ hours (d) $50\frac{705}{802}$ hours (e) $59\frac{705}{802}$ hours
35. If E work for 12 hours, B work for 35 hours, then find in how many hours remaining work will be completed by C?
 (a) 8 hours (b) 10 hours (c) 12 hours (d) 15 hours (e) 20 hours

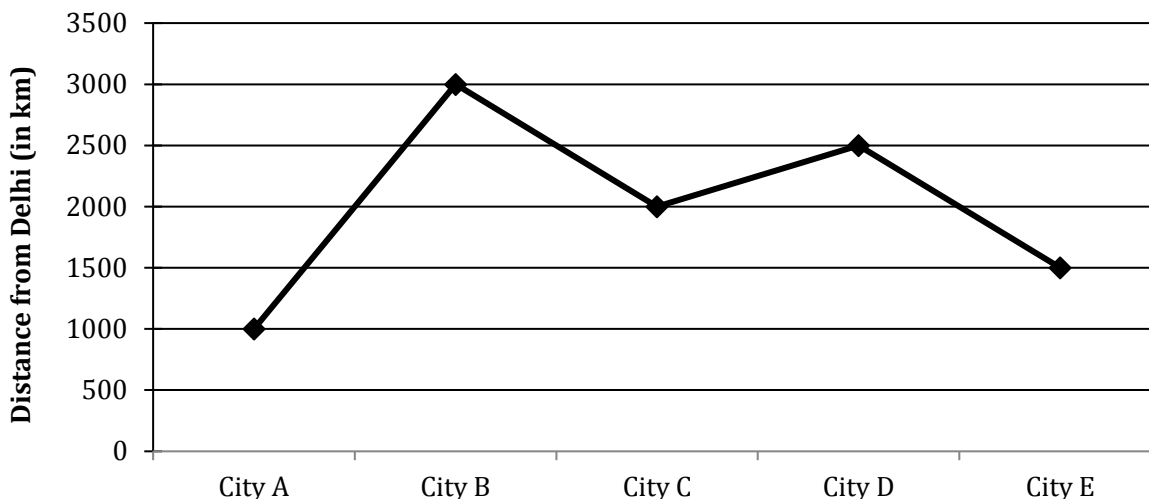
Directions (36-40): The table given below shows the total cost of production (in lakh) of 2 types of articles (X and Y), selling price of each article and % of markup price above the cost price of five companies.

Company	Article X			Article Y		
	Total cost of production	S.P. of each article	% of mark up above C.P	Total cost of production	S.P. of each article	% of mark up above C.P
A	40	2000	—	10	—	50%
B	44	—	60%	55	—	50%
C	36	—	—	40	—	—
D	50	—	40%	50	—	60%
E	—	450	60%	—	420	80%

Note:

- (i) Number of article (X and Y) produced by a company is equal but may differ with another company
 (ii) Some values are missing you have to calculate it according to questions.
36. If company 'A' gives a discount of 20% on article Y then find the selling price of each article Y. Given that company 'A' earns a profit of Rs. 400 on each article 'X'.
 (a) 600 (b) 480 (c) 540 (d) 400 (e) 450
37. Cost of production of each article X for company B and C is same then find the cost of production of each article X of company B is what percent of that of article Y of company C.
 (a) $111\frac{1}{9}\%$ (b) 80% (c) 75% (d) 90% (e) $122\frac{2}{9}\%$
38. Mark price of both article of company E is same and profit earned on both article is also same. Find the profit % on selling one article of Y of company E. (in lakh)
 (a) 55% (b) $66\frac{2}{3}\%$ (c) 75% (d) 80% (e) 50%
39. In company D, if ratio of profit% earned on article X and on article Y is in ratio 3 : 2. Find the discount % given on article Y if discount % on article Y is 3.5 times of the discount % on article X.
 (a) $7\frac{1}{7}\%$ (b) 24% (c) 35% (d) 15% (e) 25%
40. If discount given by company B on article X and article Y is 25% and 20% respectively then find the ratio of selling price of article X to article Y.
 (a) 2 : 5 (b) 3 : 5 (c) 4 : 5 (d) 1 : 5 (e) 5 : 4

Directions (41-45): Line graph given below shows the distance between Delhi to five different cities in kilometer and Table given below shows the speed of five different cars in km/hr

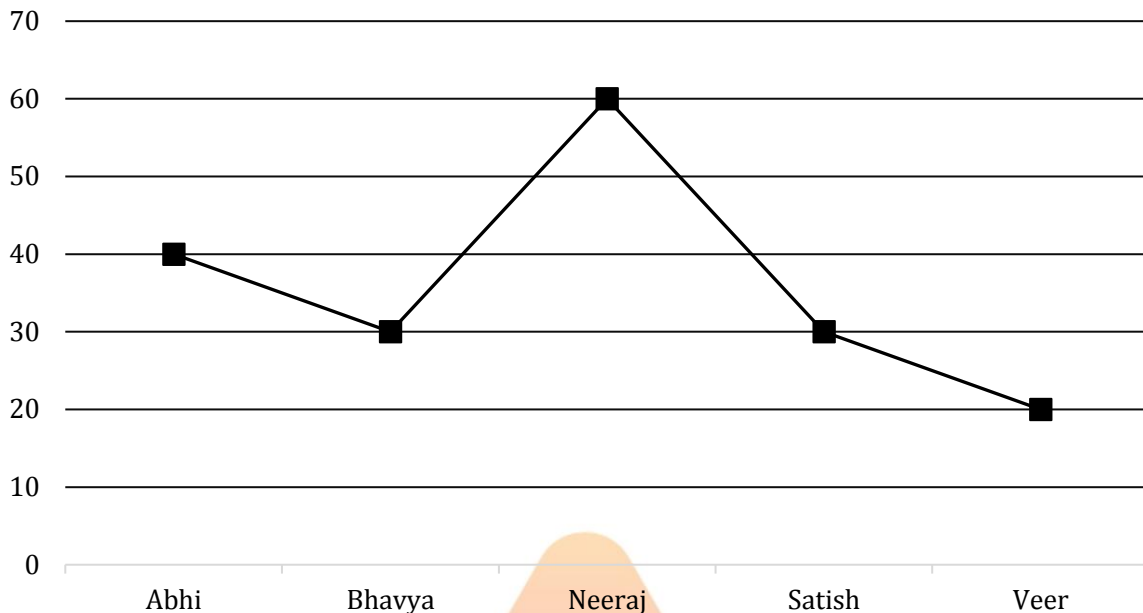


Cars	Speed (in kmph)
P	40
Q	—
R	60
S	—
T	75

NOTE: - Some data is missing you have to calculate according to question.

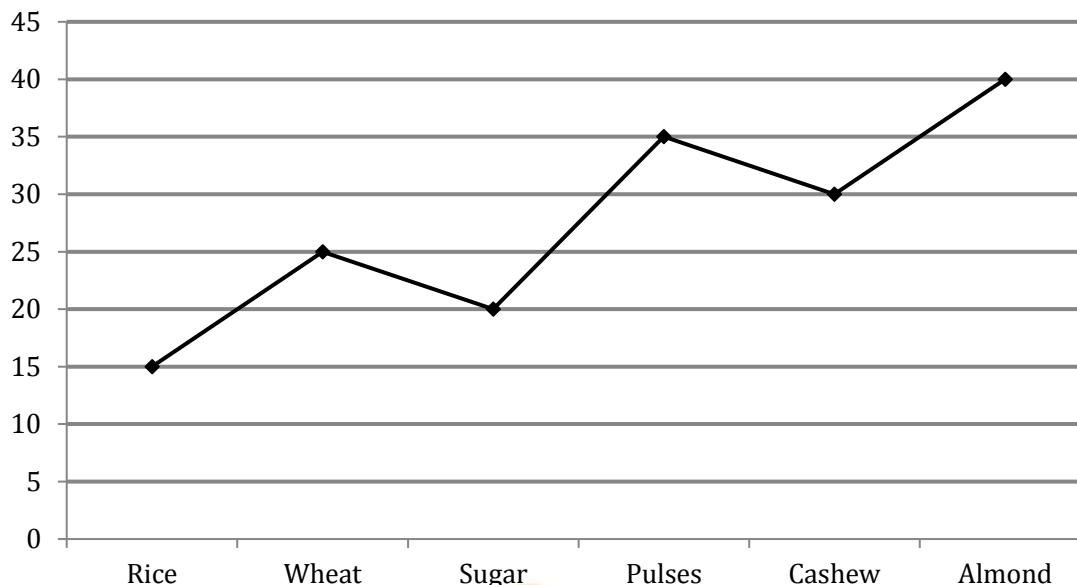
- 41.** Time taken by car 'P' to travel from city 'E' to Delhi and then Delhi to city 'B', is equal to the time taken by car 'R' to travel from Delhi to city 'A' and then city 'A' to city 'B'. Find the distance between city 'A' and city 'B'.
 (a) 5650 km (b) 5750 km (c) 5450 km (d) 5550 km (e) 5320 km
- 42.** Find the approximate time car 'T' takes to reach city 'E' from city 'A' if city 'A' and city 'E' is north and east direction of Delhi respectively.
 (a) 24 hours (b) 27 hours (c) 20 hours (d) 36 hours (e) 42 hours
- 43.** Car Q and Car S start from Delhi for city B and city C respectively and they reached in equal time. If Car Q and Car S starts from city B and city D respectively at same time and move towards each other, then time taken by car Q to cross car S is what percent of the time taken by car Q to reach city B from Delhi. Distance between city B and city D is 1500 km.
 (a) 25% (b) 20% (c) 30% (d) 40% (e) 50%
- 44.** A thief runs in a car S from Delhi to city E and after 6 hours of running, a policeman started to catch him in a car R. Due to this, thief increases the speed of his car by 100%. By this, the policeman is able to catch him at $\frac{3}{5}$ th of the distance of city E from Delhi. Find the initial speed of car 'S'.
 (a) 15 km/hr (b) 27 km/hr (c) 20 km/hr (d) 25 km/hr (e) 40 km/hr
- 45.** Car P and Car Q start from Delhi for city A. Car Q first reaches at city A and meets car P in between the way, 200 km from city 'A'. Find after how much time they will meet second time after first time meeting if they continue their to and fro motion.
 (a) 24 hours (b) 15 hours (c) 16 hours (d) 25 hours (e) 20 hours

Direction (46-50): - Line chart given below shows time taken by five different persons to complete a work 'M' alone. Ratio of efficiency of all five persons remain same throughout any work. Study the data carefully and answer the following questions.



46. All five starts working together to complete work 'X'. 'Veer' left after 8 days. Work done by 'Bhavya' is same as work done by 'Neeraj' while 'Abhi' and 'Neeraj' worked for same time. 'Satish' worked for 'y' days. If 'Bhavya', 'Neeraj' and 'Satish' together can complete work 'X' in 24 days then find the value of 'y' if Bhavya worked for starting 10 days.
 (a) 7 days (b) 9 days (c) 11 days (d) 13 days (e) 15 days
47. Abhi and Neeraj together can complete work 'Z' in $(A + 42)$ days while Bhavya and Satish together can complete work 'Z' in $(A + 15)$ days. All start the work Z such that ratio between work done by Abhi, Bhavya and Veer is $1 : 2 : 3$, while ratio between days, Neeraj, Satish and Veer worked is $2 : 2 : 1$. Find how many days 'Bhavya' worked.
 (a) 10 days (b) 15 days (c) 20 days (d) 30 days (e) 40 days
48. All five persons started together to complete work 'Y'. Veer worked for starting 6 days and left the work. After 3 days more both Bhavya and Satish left too. Remaining 40% work should be completed by Abhi and Neeraj together but 'Abhi' left after 'x' days. Remaining work is completed by 'Neeraj' in 'z' days. If $z - x = 3$, then number of days for which 'Neeraj' worked is what percent more than number of days for which 'Abhi' worked.
 (a) $33\frac{1}{3}\%$ (b) 50% (c) $66\frac{2}{3}\%$ (d) 75% (e) 100%
49. Abhi, Bhavya and Neeraj together starts to do work 'M'. After 7 days 'Neeraj' left and after 3 days more 'Abhi' and 'Bhavya' left. Remaining work is completed by Satish and Veer working alternatively in 'y' days. If 'y' is integer then find 'Veer' worked for how many days?
 (a) 3 days (b) 4 days (c) 5 days
 (d) 6 days (e) Cannot be determined
50. Abhi, Bhavya and Satish starts working together to complete work 'M'. After 5 days, Bhavya and Satish replaced by Neeraj and Veer. After 5 more days Abhi left the work. After 1 more day Veer left too. Neeraj worked for total 'x' days. In other case Abhi and Bhavya starts working together to complete 'M'. After 4 days both are replaced by Veer. Veer worked for 5 days and replaced by Satish who worked for 8 days. Remaining work is completed by Neeraj in 'y' days. Find $(y - x)^2$?
 (a) 25 (b) 36 (c) 49 (d) 64 (e) 81

Directions (51-55): Study the graph and table given below and answer the following questions. The line graph shows the listed price per kg of various items in a wholesale store.

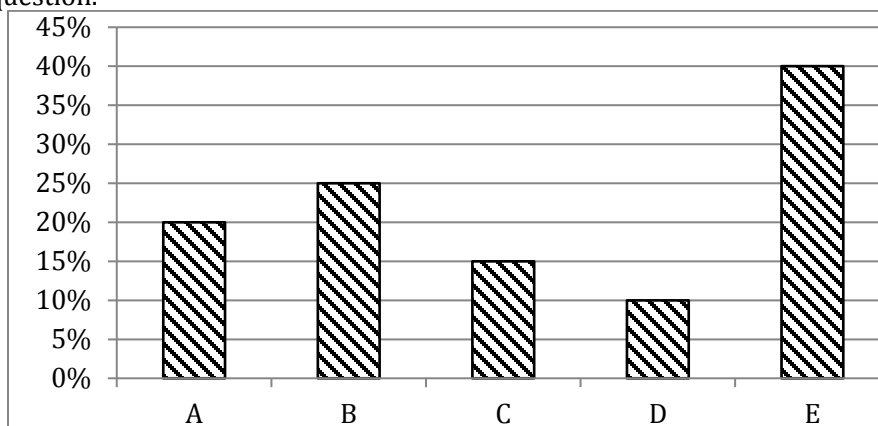


The table given below shows the number of items bought by a retailer from the wholesale store. The table also shows the discount % offered by the wholesaler on the list price and total cost incurred by the retailer.

Items	Quantity (in kgs)	Discount (in %)	Total (in Rs.)
Rice	20	10	-
Wheat	30	-	675
Sugar	15	-	240
Pulses	18	30	-
Cashew	40	-	900
Almond	25	15	-

- 51.** Calculate the profit earned by retailer on selling 20 kgs of wheat purchased by him to a customer at a discount of 5% on the listed price?
 (a) Rs. 25 (b) Rs. 45 (c) Rs. 75 (d) Rs. 50 (e) None of these
- 52.** The retailer sold all the cashew bought by him to a customer at a price 25% more than the listed price. Calculate his overall profit percent.
 (a) 33.33% (b) 66.66% (c) 55.55% (d) 42.64% (e) 77.77%
- 53.** If 50% of the rice bought by the retailer got spoiled, then at what price/kg must he sell the remaining amount of rice to be at a situation of no loss-no gain?
 (a) Rs. 40 (b) Rs. 19 (c) Rs. 27 (d) Rs. 22 (e) None of these
- 54.** The retailer sold all the pulses he bought at a price that is 30% more than the listed price and offered 2 kgs of Almond free with it. Find overall profit% of the retailer in this bargain? (approximate)
 (a) 50% (b) 40% (c) 35% (d) 61% (e) 45%
- 55.** The retailer mixed 6 kgs. of impurity (free of cost) with all the sugar he had and sold the mixture at a discount which is 25% less than that discount (in percentage) offered by the wholesaler. Find the profit % on the sale of all of the amount of this mixture?
 (a) 52.50% (b) 46.15% (c) 48.75% (d) 57.50% (e) None of these

Directions (56-60): Bar graph given below shows interest rate offered in different schemes. Study the data carefully and answer the following question.



56. Amit and Sandeep invested in scheme A and scheme B respectively in the ratio 2 : 3. After two years Sandeep got Rs. 2480 more as interest than Amit. If scheme A offered C.I. and scheme B offered SI, then find the total amount earned by both after 2 years.

- (a) Rs. 19,520 (b) Rs. 29,520 (c) Rs. 29,250 (d) Rs. 29,220 (e) Rs. 29,550

57. A man invested Rs. 'X' amount in scheme A and Rs. 'Y' amount in scheme 'E'. After two years he got equal interest from both schemes. If both schemes offered CI, then find X : Y ?

- (a) 49 : 36 (b) 24 : 11 (c) 7 : 6
(d) 2 : 1 (e) None of the given option

58. Veer invested Rs. X in scheme 'C' for two years, then he spends total amount (principal + interest) which he get from scheme C in scheme 'D' for 3 years. Scheme 'C' offered at S.I. while scheme 'D' offered at CI. If total interest earned by him from scheme 'D' is Rs. 31,272 more than interest earned by him from scheme 'C'. Find value of '2X'.

- (a) Rs. 0.24 Lakh (b) Rs. 6 Lakh (c) Rs. 2.4 Lakh (d) Rs. 4.8 Lakh (e) Rs. 0.48 Lakh

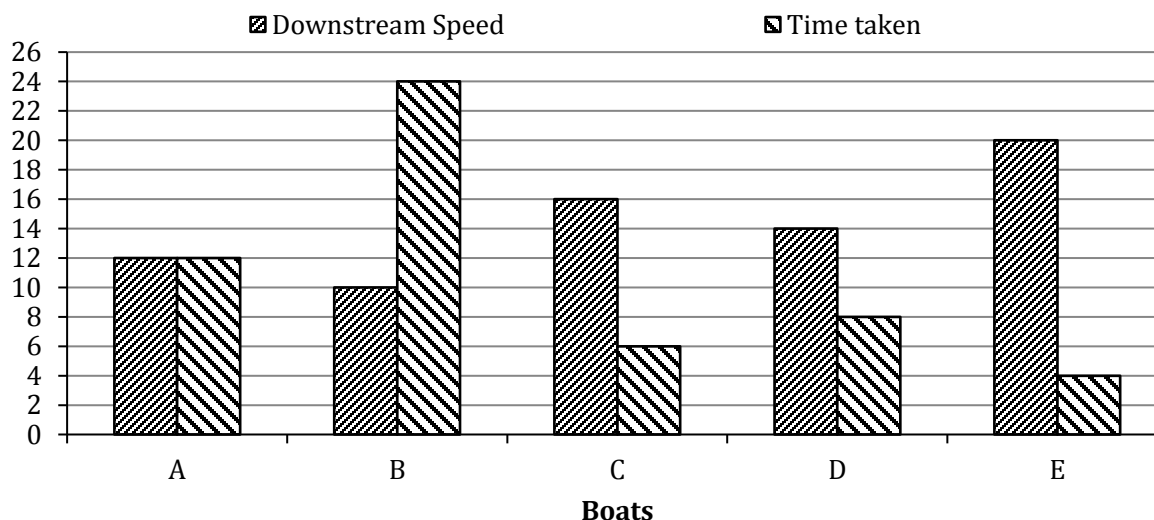
59. Two men invested in the ratio of 8 : 5 in scheme 'B' and 'E' respectively. If both schemes offered at S.I. and both men got same amount. If amount invested in scheme 'B' is for 6 years, then amount invested in scheme 'E' is for how many years?

- (a) 8 years (b) 7.5 years (c) 9 years (d) 12 years (e) 10.5 years

60. A man invested in all schemes in the ratio 5 : 4 : 3 : 2 : 1 from A to E. In which scheme, he will get maximum interest after one year?

- (a) Both A and B (b) Both A and D (c) Both B and E (d) None of the given option (e) Both A and E

Directions (61-65): Bar chart given below shows Downstream speed of five different boats in same river and time taken by these boats to cover same distance in upstream by each boat. Study the data carefully and answer the following questions.



Note: Distance travelled is same by all five boats and stream speed is same.

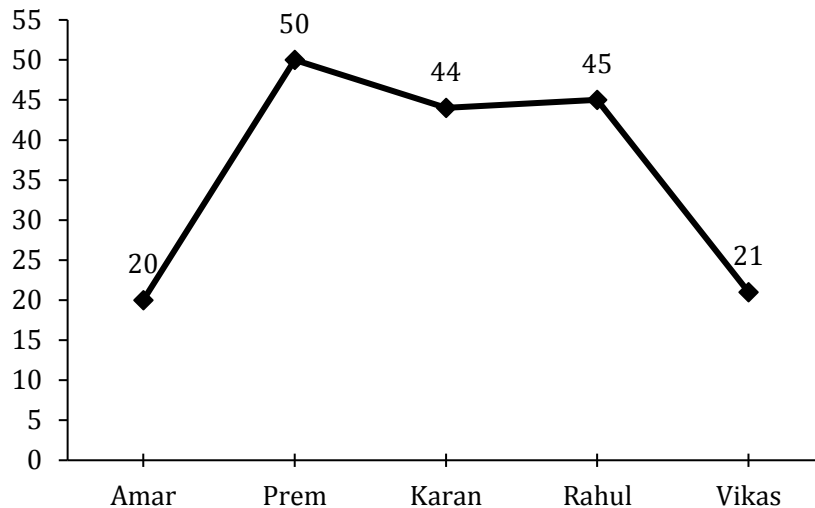
61. Boat A and boat E start from point P and Q respectively and move towards each other. If distance between P and Q is 240 km then find after how much time they will meet for second time?
 (a) 30 hours (b) 18 hours (c) 20 hours
 (d) Either 20 hours or 16 hours (e) Either 30 hours or 18 hours
62. Time taken by boat B to cover 80 km in downstream is what percent more/less than time taken by boat C to cover 48 km in upstream.
 (a) $66\frac{2}{3}\%$ (b) $33\frac{1}{3}\%$ (c) $566\frac{2}{3}\%$
 (d) $533\frac{1}{3}\%$ (e) None of the given options
63. Speed of boat A in downstream is how much more/less than speed of boat D in upstream.
 (a) 2 km/hr (b) 10 km/hr (c) 4 km/hr (d) 8 km/hr (e) 6 km/hr
64. Boat 'C' and boat 'E' starts moving in same direction in a circular river. If length of that circular river is 48 km, then after how much time they will meet second time.
 (a) 12 hours (b) 24 hours (c) 36 hours (d) 16 hours (e) 32 hours
65. Find average of speed of boat A, B and D in still water?
 (a) 7 km/hr (b) 6 km/hr (c) None of the given options
 (d) 8 km/hr (e) 9 km/hr

Directions (66-70): The graph shows the overall % of interest obtained on principal invested by five persons for different time period. Table below shows the few of details of money invested and obtained by five friends.

NOTE: 'Amount invested' means the principal value of a person.

'Amount obtained' means the amount which he received after his given time period.

ROI is calculated on per annum basis



Name	Time (in year)	ROI	Principal	Amount
Amar			25000	
Prem				24000
Karan	2			
Rahul		15%		
Vikas	2			

Answer the following questions on the basis of information.

66. Amount obtained by Vikas after two years is submitted in the bank whose interest rate is same as that of bank of Karan. Find the total amount with him (Vikas) after further two years is what % of his initial principal.
 (a) 74.24 % (b) 37.36% (c) 92.46% (d) 174.24% (e) 167.3%

67. If Karan had invested his amount for 1 more year, the amount received by him is Rs. 6336 more than now. Calculate principal invested by him.
 (a) Rs. 22,000 (b) Rs. 120000 (c) Rs. 28,800
 (d) Rs. 15112 (e) Either Rs. 22,000 or Rs. 28,800
68. Ratio of ROI of each year for Amar and Prem is inverse ratio of their amount obtained. Find the ratio of their time (Amar : Prem) for which they invested given that both invested at SI.
 (a) 1 : 2 (b) 3 : 4 (c) 4 : 3 (d) 4 : 5 (e) can't be determined
69. Karan invested $33\frac{1}{3}\%$ of amount obtained by Amar. Rahul invested $83\frac{1}{3}\%$ of amount obtained by Karan. Find the difference between final amount obtained by Karan and Rahul.
 (a) Rs. 3300 (b) Rs. 3000 (c) Rs. 3400 (d) Rs. 4400 (e) None of these
70. If Vikas invested twice the amount invested by Karan and both invested at CI; difference between interest obtained in second year is Rs. 240. Find the amount obtained by Vikas if he had invested his money for 3 years at same ROI at CI.
 (a) Rs. 26,620 (b) Rs. 13,310 (c) Rs. 18,690 (d) Rs. 24,620 (e) Rs. 31,944

Previous Years' Solutions of Mains

1. **(d):** Total SP of Article-II for shops A, B and C = 441×3
 = Rs. 1323
 Profit on Article-II for store A and B = $(20+35) =$
 55% of 420 = Rs. 231
 Therefore, SP of article-II for store A and B =
 $231+840 =$ Rs. 1071
 So, SP of Article-II for store C = $1323-1071 =$ Rs.
 252
 and CP = Rs. 420
 Required loss% = $\frac{168}{420} \times 100 = 40\%$
2. **(e):** MP_A on article-I = $1.64 \times 200 =$ Rs. 328
 $Sp_A = 1.23 \times 200 =$ Rs. 246
 Discount by A = $328 - 246 =$ Rs. 82
 MP_B on article-I = $1.42 \times 200 =$ Rs. 284
 $Sp_B = 113.6\%$ of 200 = Rs. 227.2
 Discount by B = $284 - 227.2 =$ Rs. 56.8
 Required difference = $82 - 56.8 =$ Rs. 25.2
3. **(c):** CP of article V = $1.25 \times 320 = 400$
 Selling price of article IV by store B = $320 \times \frac{6}{5} =$
 Rs. 384
 Sp_B of Article V : Sp_B of article IV
 $21 : 16$
 $? : 384$
 $? = 24 \times 21 = 504$
 Required Profit % = $\frac{104}{400} \times 100 = 26\%$
4. **(b):** Selling price of article III for store A = $480 \times$
 $\frac{124}{100} =$ Rs. 595.2
 Selling price of article III for store B = $480 \times$
 $\frac{105}{100} =$ Rs. 504
 So, required % = $\frac{595.2-504}{504} \times 100$
 $\approx 18\%$
5. **(c):** Selling price of article III for store A = $480 \times$
 $\frac{124}{100} =$ Rs. 595.2
 Selling price of article IV for store B = $320 \times$
 $\frac{120}{100} =$ Rs. 384
 So, req. % = $\frac{211.2}{595.2} \times 100 = 35\%$
6. **(e):** Selling price of article I for store B = $200 \times$
 $\frac{113.6}{100} =$ Rs. 227.2
 So, required ratio = $420:227.2$
 $= 525:284$
7. **(b):** We know volume of cylinder = $\pi r^2 h$
 In cylinder A number of such cubes filled = $\frac{22}{7}$
 $\times \frac{10 \times 10 \times 14}{2 \times 2 \times 2} = 550$
 In cylinder B number of such cubes filled = $\frac{22}{7}$
 $\times \frac{7 \times 7 \times 20}{2 \times 2 \times 2} = 385$
 Required difference = $550 - 385 = 165$
8. **(e):** We know volume of cylinder = $\pi r^2 h$
 Empty volume of cylinder C = $\frac{(100-40)}{100} \times \frac{22}{7} \times$
 $14 \times 14 \times 12$
 $= \frac{3}{5} \times 22 \times 2 \times 14 \times 12$
 $= 4435.2 \text{ cm}^3$
 Empty volume of cylinder D = $\frac{(100-80)}{100} \times \frac{22}{7} \times$
 $21 \times 21 \times 9$
 $= \frac{1}{5} \times 22 \times 3 \times 21 \times 9$
 $= 2494.8 \text{ cm}^3$
 Required difference = $4435.2 - 2494.8 = 1940.4$
 cm^3

9. (c): Diameter of cylinder A = $10 \times 2 = 20$ cm
 Diameter of cylinder C = $14 \times 2 = 28$ cm
 Difference between diameter and height of cylinder A = $20 - 14 = 6$ cm
 Difference between diameter and height of cylinder C = $28 - 12 = 16$
 Required percentage = $\frac{16-6}{16} \times 100 = 62.5\%$
10. (a): We know curved surface area of cylinder = $2\pi rh$
 Required ratio = $\frac{2\pi \times 21 \times 9}{2\pi \times 10 \times 14} = 27 : 20$
11. (b): We know total surface area of cylinder = $2\pi rh + 2\pi r^2$
 Total surface area of cylinder B = $2 \times \frac{22}{7} \times 7 \times 20 + 2 \times \frac{22}{7} \times 7 \times 7$
 $= 880 + 308 = 1188 \text{ cm}^2$
 Total surface area of cylinder E = $2 \times \frac{22}{7} \times 12 \times 21 + 2 \times \frac{22}{7} \times 12 \times 12$
 $= 1584 + \frac{6336}{7} = \frac{17424}{7} \text{ cm}^2$
 Required sum = $1188 + \frac{17424}{7} = \frac{25740}{7} \text{ cm}^2$
12. (d): We know volume of cylinder = $\pi r^2 h$
 Volume of cylinder C = $\frac{22}{7} \times 14 \times 14 \times 12 = 7392 \text{ cm}^3$
 Volume of cylinder D = $\frac{22}{7} \times 21 \times 21 \times 9 = 12474 \text{ cm}^3$
 Volume of cylinder E = $\frac{22}{7} \times 12 \times 12 \times 21 = 9504 \text{ cm}^3$
 Required average = $\frac{7392+12474+9504}{3} = \frac{29370}{3} = 9790 \text{ cm}^3$

Sol. (13-15):

For Mars video course:

$$A \times 88 = (A + 8) \times 66$$

$$\Rightarrow A = 24$$

For Jupiter video course:

$$B \times (B - 1) = (B + 6) (B - 6)$$

$$\Rightarrow B^2 - B = B^2 - 36$$

$$\Rightarrow B = 36$$

For Pluto video course:

$$N^2 \times 75 = X^2 \times 108$$

$$\Rightarrow N = 1.2X$$

13. (c): Total number of employees working in team
 $= \frac{1.2X}{2} \times 2X = 1.2X^2$

$$\text{Required days} = \frac{108 \times X^2}{1.2X^2} = 90 \text{ days.}$$

14. (c): Required days = $\frac{24 \times 88}{64} = 33 \text{ days.}$

15. (b): In ten days, total Jupiter video course complete
 by $\frac{B}{2}$ employee = $0.5 \times 36 \times 10 = 180$ units
 Now, total employee = $0.5B + 0.5B = 36$
 Let 36 employee work for n days to complete the remaining Jupiter video course.
 ATQ,
 $36 \times n + 180 = 36 \times 35$
 $\Rightarrow n = 30 \text{ days.}$
 Total required days = $10 + 30 = 40 \text{ days}$
16. (c): S.P. of article D sold by Ravi = Rs.120
 Profit % earned on article D by Ravi = 60%
 Cost price of article D for Ravi = $\frac{120}{160} \times 100 = \text{Rs}75$
 Profit earned by Shyam = $120 \times \frac{25}{100} = \text{Rs}30$
 Profit earned by Ravi = $120 - 75 = \text{Rs}45$
 Required difference = $45 - 30 = \text{Rs}15$
17. (b): Cost price of article A = $\frac{105}{140} \times 100 = \text{Rs}75$
 Cost price of article C = $\frac{150}{125} \times 100 = \text{Rs}120$
 Required % = $\frac{120-75}{120} \times 100 = \frac{45}{120} \times 100 = 37.5\%$
18. (d): Cost price of article B = $\frac{60}{120} \times 100 = \text{Rs}50$
 Marked price of article B = $50 \times 1.5 = \text{Rs}75$
 Required discount % = $\frac{75-60}{75} \times 100$
 $= \frac{15}{75} \times 100 = 20\%$
19. (e): Profit earned on selling article E = $\frac{90}{180} \times 80 = \text{Rs}40$
 Profit earned on selling article C = $\frac{150}{125} \times 25 = \text{Rs}30$
 Required difference = $40 - 30 = \text{Rs}10$
20. (b): Mark price of article A = $\frac{105}{84} \times 100$
 $= \text{Rs}125$
 CP of article A = $\frac{105}{140} \times 100 = \text{Rs}75$
 Mark up % of article A = $\frac{125-75}{75} \times 100 = 66\frac{2}{3}\%$
21. (b): Ratio of profit share of B and E is
 $35\% \times 80,000 \times 9 : 15\% \text{ of } 80,000 \times 12$
 $= 7 : 4$
 Required difference = $\frac{(7-4)}{11} \times 15400$
 $= \frac{3}{11} \times 15400 = \text{Rs}4200$

22. (d): Ratio of profit share of A, C and D is

$$\begin{array}{ccc} A & : & C & : & D \\ 25\% \times 80,000 \times 6 & : & 15\% \times 80,000 \times x & : & 10\% \times 80,000 \times 8 \\ 150 & : & 15x & : & 80 \\ 30 & : & 3x & : & 16 \end{array}$$

$$\begin{aligned} \text{ATQ,} \\ \frac{30}{30+16+3x} &= \frac{6750}{13050} \\ \Rightarrow \frac{30}{46+3x} &= \frac{15}{29} \\ \Rightarrow 46 + 3x &= 58 \\ x &= 4 \text{ months} \end{aligned}$$

23. (a): Amount invested by F = $\frac{15}{100} \times 80,000 + 4000$

$$= 12000 + 4000 = \text{Rs } 16,000$$

Amount invested by A

$$= \frac{25}{100} \times 80,000 = \text{Rs } 20,000$$

Ratio of profit share of F, C and A

$$\begin{array}{ccc} F & : & C & : & A \\ 16000 \times 6 & : & 12000 \times 8 & : & 20,000 \times 12 \\ 2 & : & 2 & : & 5 \end{array}$$

$$\begin{aligned} \text{ATQ,} \\ 5 + 2 &\rightarrow 8750 \end{aligned}$$

$$\text{Then total annual profit} = 9 \rightarrow \frac{8750}{7} \times 9 = \text{Rs}$$

$$11,250$$

24. (d): Let marked price of article P & Q be 500x Rs. and 600x Rs. respectively

$$\begin{aligned} \text{Selling price of article P} &= 500x \times \frac{90}{100} \times \frac{80}{100} = \\ &360x \text{ Rs.} \end{aligned}$$

$$\begin{aligned} \text{Selling price of article Q} &= 600x \times \frac{7}{8} \times \frac{90}{100} = \\ &472.5x \text{ Rs.} \end{aligned}$$

$$\begin{aligned} \text{ATQ -} \\ 472.5x - 360x &= 450 \\ 112.5x &= 450 \end{aligned}$$

$$x = 4$$

$$\begin{aligned} \text{Required difference} &= (600 \times 4 - 500 \times 4) = \\ &400 \text{ Rs.} \end{aligned}$$

25. (a): Let marked price of P = Rs. 400x

$$\text{So, marked price of S} = 400x \times \frac{75}{100} = 300x \text{ Rs.}$$

$$\text{Selling price of P} = 400x \times \frac{90}{100} \times \frac{80}{100} = 288x \text{ Rs.}$$

$$\text{Selling price of S} = 300x \times \frac{80}{100} \times \frac{90}{100} = 216x \text{ Rs.}$$

$$\begin{aligned} \text{ATQ -} \\ 288x + 216x &= 2520 \\ 504x &= 2520 \\ x &= 5 \end{aligned}$$

$$\text{Cost price of P} = 288 \times 5 \times \frac{5}{6} = 1200 \text{ Rs.}$$

$$\text{Cost price of S} = 216 \times 5 \times \frac{100}{90} = 1200 \text{ Rs.}$$

$$\text{Required ratio} = 120 : 120 = 1 : 1$$

26. (d): Let marked price of Q & S be 'x' & 'y' respectively

$$\text{Selling price of Q} = x \times \frac{7}{8} \times \frac{90}{100} = \frac{630x}{800}$$

$$\text{Selling price of S} = y \times \frac{80}{100} \times \frac{90}{100} = \frac{72y}{100}$$

$$\text{ATQ, } \frac{630x}{800} : \frac{72y}{100} = 7 : 4$$

$$x : y = 8 : 5$$

27. (a): Let marked price of P be Rs. 400x

$$\begin{aligned} \text{So, selling price of P} &= 400x \times \frac{90}{100} \times \frac{80}{100} = \\ &\text{Rs. } 288x \end{aligned}$$

When, second discount is increased by 25%, then new selling price of P

$$= 400x \times \frac{90}{100} \times \frac{75}{100} = 270x \text{ Rs.}$$

$$\text{Given, } 288x - 270x = 90$$

$$18x = 90$$

$$x = 5$$

$$\text{Selling price of R} = 288 \times 5 - 110 = 1330 \text{ Rs.}$$

$$\text{Marked price of R} = 1330 \times \frac{100}{87.5} \times \frac{100}{95} = 1600 \text{ Rs.}$$

28. (c): Let marked price of P & S be Rs. 'a' and Rs. 'b' respectively

$$\text{Selling price of P} = a \times \frac{90}{100} \times \frac{80}{100} = 0.72a \text{ Rs.}$$

$$\text{Selling price of S} = b \times \frac{80}{100} \times \frac{90}{100} = 0.72b \text{ Rs.}$$

$$\text{ATQ -}$$

$$0.72a : 0.72b = 4 : 3$$

$$a : b = 4 : 3$$

So, marked price of P and S is Rs. 4000 and Rs. 3000

$$\text{Selling price of P} = 4000 \times 0.72 = 2880 \text{ Rs.}$$

$$\text{Selling price of S} = 3000 \times 0.72 = 2160 \text{ Rs.}$$

$$\text{Required difference} = 2880 - 2160 = 720 \text{ Rs.}$$

Sol. (29-30):

Let there are x girls in class A

$$\frac{50}{50+x} = \frac{5}{12}$$

$$x = 70 \text{ (girls in class A)}$$

let there are y & z boys in class B & C respectively

$$\frac{y+z}{50+y+z} = \frac{14}{19}$$

$$y + z = 140 \text{(i)}$$

$$\frac{y}{y+80} = \frac{z}{z+60}$$

$$yz + 60y = yz + 80z$$

$$y : z = 4 : 3 \text{(ii)}$$

using (i) & (ii)

$$y = 80, \quad z = 60$$

	A	B	C
Boys	50	80	60
Girls	70	80	60

29. (a): Boys in class BC = 60

30. (d): total students in class B = 80 + 80 = 160

$$\text{Total student in class A} = 50 + 70 = 120$$

$$\text{Required \%} = \frac{160-120}{120} \times 100 = 33\frac{1}{3}\%$$

31. (a): Total work = 10080 units (LCM of days taken by all)

$$\text{Efficiency of A} = \frac{10080}{70} = 144 \text{ units/hour}$$

$$\text{Efficiency of C} = \frac{10080}{90} = 112 \text{ units/hour}$$

$$\text{Efficiency of D} = \frac{10080}{32} = 315 \text{ units/hour}$$

$$\text{New efficiency of A} = 144 \times \frac{7}{8} = 126 \text{ units/hour}$$

$$\text{New efficiency of D} = 315 \times \frac{2}{3} = 210 \text{ units/hour}$$

$$\text{Required time} = \frac{10080}{(126+112+210)}$$

$$= 22.5 \text{ hours}$$

32. (c): Total work = 10080 units (LCM of days taken by all)

$$\text{Efficiency of A} = \frac{10080}{70} = 144 \text{ units/hour}$$

$$\text{Efficiency of B} = \frac{10080}{60} = 168 \text{ units/hour}$$

$$\text{Efficiency of E} = \frac{10080}{48} = 210 \text{ units/hour}$$

$$\text{Efficiency of F} = \frac{10080}{36} = 280 \text{ units/hour}$$

$$\text{New efficiency of F} = 280 \times \frac{3}{4} = 210 \text{ units/hour}$$

ATQ -

$$\frac{(210+210)(y)}{168(y+1)} = \frac{2}{1}$$

$$420y = 336y + 336$$

$$420y - 336y = 336$$

$$84y = 336$$

$$y = \frac{336}{84}$$

$$y = 4 \text{ hour}$$

$$\text{Total work} = 420y + 168(y+1)$$

$$= 420 \times 4 + 168(4+1)$$

$$= 420 \times 4 + 168 \times 5$$

$$= 2520 \text{ units}$$

$$\text{A will complete} = \frac{2520}{144} = 17\frac{1}{2} \text{ hours}$$

33. (a): Total work = 10080 units (LCM of days taken by all)

$$\text{Efficiency of A} = \frac{10080}{70} = 144 \text{ units/hour}$$

$$\text{Efficiency of B} = \frac{10080}{60} = 168 \text{ units/hour}$$

$$\text{Efficiency of C} = \frac{10080}{90} = 112 \text{ units/hour}$$

$$\text{Efficiency of D} = \frac{10080}{32} = 315 \text{ units/hour}$$

$$\text{Efficiency of E} = \frac{10080}{48} = 210 \text{ units/hour}$$

$$\text{Efficiency of F} = \frac{10080}{36} = 280 \text{ units/hour}$$

$$\text{G in one hour} = 144 \times \frac{3}{2} = 216 \text{ units/hour}$$

$$\text{H in one hour} = 168 \times \frac{75}{100} = 126 \text{ units/hour}$$

Let C work for n hours and G & H work for (n + 23.5) hours

ATQ -

$$n \times 112 + (216 + 126)(n + 23.5) = 10080$$

$$112n + 342(n+23.5) = 10080$$

$$112n + 342n + 8037 = 10080$$

$$112n + 342n = 10080 - 8037$$

$$454n = 2043$$

$$n = \frac{2043}{454}$$

$$n = 4.5 \text{ hours}$$

$$\text{Total time} = n + (n + 23.5)$$

$$= (4.5 + 4.5 + 23.5)$$

$$= 32.5 \text{ hours}$$

34. (d): Total work = 10080 units (LCM of days taken by all)

$$\text{Efficiency of A} = \frac{10080}{70} = 144 \text{ units/hour}$$

$$\text{Efficiency of B} = \frac{10080}{60} = 168 \text{ units/hour}$$

$$\text{Efficiency of C} = \frac{10080}{90} = 112 \text{ units/hour}$$

$$\text{Efficiency of D} = \frac{10080}{32} = 315 \text{ units/hour}$$

$$\text{Efficiency of E} = \frac{10080}{48} = 210 \text{ units/hour}$$

$$\text{Efficiency of F} = \frac{10080}{36} = 280 \text{ units/hour}$$

First hour total work of A, B, E and F

$$= (144 + 168 + 210 + 280)$$

$$= 802 \text{ units}$$

In Second hour total task destroy by C & D

$$= -(315 + 112)$$

$$= - (427)$$

$$\text{Total work in 2 hours} = 802 - 427 = 375 \text{ units}$$

$$\text{Total required time} = \frac{10080 \times 2}{375} \quad [375 \text{ is the total work done in 2 hours}]$$

$$= \frac{672 \times 2}{25}$$

$$= \frac{1344}{25}$$

$$= \frac{25}{25}$$

$$= 53\frac{19}{25} \text{ hours}$$

35. (d): Efficiency of E = $\frac{10080}{48} = 210 \text{ units/hour}$

$$\text{Efficiency of B} = \frac{10080}{60} = 168 \text{ units/hour}$$

$$\text{Efficiency of C} = \frac{10080}{90} = 112 \text{ units/hour}$$

Work done by E & B:

$$E = 210 \times 12 = 2520$$

$$B = 168 \times 35 = 5880$$

$$\text{Remaining work} = 10080 - (2520 + 5880)$$

$$= 10080 - 8400$$

$$= 1680 \text{ units}$$

$$\text{Required days} = \frac{1680}{112}$$

$$= 15 \text{ days}$$

36. (b): For company A,

$$\text{S.P. of each article X} = 2000$$

$$\text{C.P. of each article X} = 2000 - 400 = 1600$$

$$\text{Total cost of production of article X} = 40 \text{ lakh}$$

$$\text{Number of article X} = \frac{4000000}{1600} = 2500$$

$$\text{Number of article Y} = 2500$$

$$\text{C.P. of each article Y} = \frac{1000000}{2500} = 400$$

$$\text{M.P. each article Y} = \frac{400 \times 150}{100} = 600 \text{ Rs.}$$

$$\text{S.P. each article Y} = \frac{600 \times 80}{100} = 480 \text{ Rs.}$$

37. (d): Let number of article Y produced by company B and C is a and b respectively
 So
 ATQ
 $\Rightarrow \frac{44}{a} = \frac{36}{b}$
 $\frac{a}{b} = \frac{11}{9}$
 Let a and b $\rightarrow 11c$ and $9c$
 Cost of production of article Y by company C = $\frac{40}{9c}$
 Required% = $\frac{44}{11c \times 40} \times 9c \times 100 = 90\%$

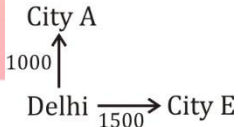
38. (c): Let mark price of both article is 100x
 So,
 C.P. of article X = $\frac{100x}{160} \times 100$
 And C.P. of article Y = $\frac{100x}{180} \times 100$
 Ratio = $\frac{\text{C.P. of article X}}{\text{C.P. of article Y}} = \frac{9}{8}$
 Let cost price of article X and article Y is 9a and 8a
 Let profit on each article = y
 So, ATQ
 $9a + y = 450 \dots(i)$
 $8a + y = 420 \dots(ii)$
 Solving (i) and (ii)
 $a = 30$ and $y = 180$
 $9a \rightarrow 270$
 $8a \rightarrow 240$
 Required % = $\frac{180}{240} \times 100 = 75\%$

39. (e): In company D,
 Let C.P. of each article of X and Y = a
 So M.P. of article X $\rightarrow 1.4a$
 M.P. of article Y = $1.6a$
 Let y and z is the discount is offered on article X and article Y respectively.
 For article X
 $1.4a \left(\frac{100-y}{100} \right) = \frac{a(100+3x)}{100}$
 where 3x is the profit% earned on article X
 $1400 - 14y = 1000 + 30x$
 $15x + 7y = 200 \dots(i)$
 For article Y
 $\frac{1.6a(100-z)}{100} = a \left(\frac{100+2x}{100} \right)$
 where 2x is the profit% earned on article Y
 $\Rightarrow 5x + 4z = 150 \dots(ii)$
 On Solving (i) and (ii)
 $12z - 7y = 250$
 Now,
 $z = 3.5y$
 $y = \frac{50}{7} \%$
 Discount on article Y = $\frac{50}{7} \times 3.5 = 25\%$

40. (c): Company B,
 Ratio of C.P. of each article X and article Y = 4 : 5
 Let C.P. of article X = 4a
 C.P. of article Y = 5a
 M.P. of article X = $\frac{4a \times 160}{100} = 6.4a$
 M.P. of article Y = $\frac{5a \times 150}{100} = 7.5a$
 S.P. of article X = $\frac{(6.4a \times 3)}{4} = 4.8a$
 S.P. of article Y = $\frac{7.5a \times 4}{5} = 6a$
 Required Ratio = 4 : 5

41. (b): Distance travel by car P = 1500 + 3000 = 4500 km
 Total Time taken = $\frac{4500}{40} = 112.5$ hour
 Time taken by car R from Delhi to City A = $\frac{1000}{60} = \frac{50}{3}$ hours
 Time taken from city A to city B = $112.5 - \frac{50}{3}$
 $= \frac{287.5}{3}$
 Distance from between City A to city B
 $= \frac{287.5}{3} \times 60 = 5750$ km

42. (a):



City A
 \uparrow 1000
 Delhi $\xrightarrow{1500}$ City E
 Distance between city A and city E =
 $\sqrt{1000^2 + 1500^2} = \sqrt{1000000 + 2250000}$
 $= \sqrt{3250000} = 500\sqrt{13}$ km
 Approximate time taken by car 'T'
 $= \frac{500\sqrt{13}}{75} \approx 24$ hours

43. (c): Let speeds of car Q and car S be x and y respectively.
 ATQ—
 $\Rightarrow \frac{3000}{x} = \frac{2000}{y}$
 $\Rightarrow \frac{x}{y} = \frac{3}{2}$
 Let speed of car Q and car S be 3a and 2a respectively
 Distance between city B and city D = 1500 km
 Time taken to cross each other = $\frac{1500}{5a} = \frac{300}{a}$
 Time taken by car Q to reach city B from Delhi =
 $\frac{3000}{3a} = \frac{1000}{a}$
 Required% = $\frac{300 \times 100}{1000} = 30\%$

44. (d): $\frac{1500 \times 3}{5} = 900 \text{ km}$

Time taken by car R to cover this distance

$$= \frac{900}{60} = 15 \text{ hour}$$

Let initial speed of car S = x km/hr

So, ATQ

$$6x + 15(2x) = 900$$

$$6x + 30x = 900$$

$$36x = 900$$

$$x = 25 \text{ km/hr}$$

45. (e): Distance between Delhi and city A = 1000 km

Distance covered by Car Q before first meeting = 1200 km

Distance covered by Car P before first meeting = 800 km

Speed of car P = 40 km/hr

$$\Rightarrow \text{Time for first meeting} = \frac{800}{40} = 20 \text{ hr}$$

$$\text{Speed of car Q} = \frac{1200}{20} = 60 \text{ km/hr}$$

When car P reaches city 'A' distance covered by

$$\text{car 'Q'} = \frac{200}{40} \times 60 = 300 \text{ km}$$

$$\text{Time taken by car 'Q' to reach Delhi} = \frac{500}{60} = \frac{25}{3} \text{ hr}$$

$$\text{Distance covered by car 'P' in } \frac{25}{3} \text{ hour} = \frac{25}{3} \times 40 =$$

$$\frac{1000}{3} \text{ km}$$

$$\text{Distance between car 'Q' and car 'P'} = 1000 -$$

$$\frac{1000}{3} = \frac{2000}{3}$$

$$\text{Time to meet} = \frac{\frac{2000}{3}}{60+40} = \frac{20}{3} \text{ hour}$$

$$\text{Total time} = \frac{200}{40} + \frac{25}{3} + \frac{20}{3} = 20 \text{ hours}$$

46. (d): Total work = $24 \times (4a + 2a + 4a) = 240a$

Bhavya worked for 10 days

$$\Rightarrow \text{Work done by 'Bhavya'} = 40a$$

$$\Rightarrow \text{Time taken by 'Neeraj'} = \frac{40a}{2a} = 20 \text{ days}$$

\Rightarrow 'Neeraj' and 'Abhi' worked for 20 days

And 'Veer' worked for 8 days

$$20 \times 3a + 10 \times 4a + 20 \times 2a + y \times 4a + 8 \times 6a = 240a$$

$$\Rightarrow 118a + y \times 4a = 240a$$

$$\Rightarrow y = \frac{240a - 118a}{4a}$$

$$\Rightarrow y = \frac{52a}{4a} = 13 \text{ days}$$

47. (b): $5a \times (A + 42) = 8a \times (A + 15)$

$$\Rightarrow 5A + 210 = 8A + 120$$

$$\Rightarrow A = 30$$

$$\text{Total work} = 5a(30 + 42) = 5a(72)$$

$$= 360a$$

Let, Abhi, Bhavya and Veer worked for x, y and z days

ATQ,

$$3x : 4y : 6z = 1 : 2 : 3$$

Ratio between working days of Abhi, Bhavya and Veer

$$\Rightarrow x : y : z = 2 : 3 : 3$$

Ratio between working days of Neeraj, Satish and Veer

$$= 2 : 2 : 1$$

Let working days of Abhi, Bhavya, Neeraj, Satish and Veer be 2m, 3m, 6m and 6m and 3m days respectively

ATQ,

$$3a \times 2m + 4a \times 3m + 2a \times 6m + 4a \times 6m + 6a \times 3m = 360a$$

$$\Rightarrow 72am = 360a$$

$$\Rightarrow m = 5$$

Bhavya worked for $5 \times 3 = 15$ days

48. (b): Veer, Bhavya and Satish worked for 6 days, 9 days and 9 days respectively. Total 60% of work completed by them

$$\Rightarrow 60\% \text{ of work} = 4a \times 9 + 4a \times 9 + 6a \times 6 = 108a$$

$$\Rightarrow \text{Total work} = \frac{108a}{3} \times 5 = 180a$$

'Abhi' worked for $(9 + x)$ days & 'Neeraj' worked for $(9 + x + z)$ days and completed 40% of work

$$\Rightarrow 72a = 3a(9 + x) + 2a(9 + x + z)$$

$$72 = 27 + 3x + 18 + 2x + 2z$$

$$27 = 5x + 2z \quad \dots(i)$$

And,

$$z - x = 3 \quad \dots(ii)$$

On solving (i) & (ii)

$$z = 6, x = 3$$

'Abhi' worked for $(9 + 3) = 12$ days

'Neeraj' worked for $(9 + x + z) = 9 + 3 + 6 = 18$

$$\text{Required \%} = \frac{18-12}{12} \times 100$$

$$= \frac{6}{12} \times 100 = 50\%$$

49. (b): There are two possibilities

First - Satish worked first

Second - Veer worked first

When satish worked first

$$\text{remaining work} \rightarrow 120a - 10(3a+4a) - 7(2a) = 36a$$

Satish and Veer worked in 3 days = 30a

4th day satish's worked = 4a

Veer's worked for = $1/3$ day

Now 'y' cannot be in fraction

2nd case-

When Veer worked first-

Veer and Satish worked for first 3 day = 30a

Remaining work = $6/6 = 1$ day

So Veer worked for 4 days.

50. (d): In first case

ATQ,

$$\frac{10}{40} + \frac{5}{30} + \frac{x}{60} + \frac{5}{30} + \frac{6}{20} = 1$$

$$\Rightarrow \frac{x}{60} + \frac{53}{60} = 1$$

$$\Rightarrow \frac{x}{60} = \frac{7}{60}$$

$$\Rightarrow x = 7$$

51. (a): Cost price of 20 kg of wheat for retailer =

$$20 \times 25 \times \frac{90}{100} = \text{Rs. } 450$$

Price at which he sold this amount of wheat to

$$\text{customer} = 20 \times 25 \times \frac{95}{100}$$

$$= \text{Rs. } 475$$

$$\text{Profit} = 475 - 450 = 25$$

52. (b): Cost price of cashew for retailer = Rs. 900

Price at which he sold all the cashew

$$= 40 \times 30 \times \frac{125}{100}$$

$$= \text{Rs. } 1500$$

$$\text{Profit \%} = \frac{1500-900}{900} \times 100 = 66.66\%$$

53. (c): Cost price of Rice for Retailer = $20 \times 15 \times \frac{90}{100}$

$$= \text{Rs. } 270$$

To be in a situation of no loss –no gain, he must sell remaining 50% at Rs. 270.

$$\text{Price per kg} = \frac{270}{10} = \text{Rs. } 27$$

54. (d): Cost price of pulses for the retailer = $18 \times 35 \times \frac{70}{100}$

$$= \text{Rs. } 441$$

$$\text{Cost price of 2 kgs of Almond} = 2 \times 40 \times \frac{85}{100} = \text{Rs. } 68$$

$$\text{Total CP} = 441 + 68 = \text{Rs. } 509$$

$$\text{Total SP} = 18 \times 35 \times \frac{130}{100} = \text{Rs. } 819$$

$$\text{Profit \%} = \frac{819-509}{509} \times 100 = \frac{310}{509} \times 100 \approx 61\%$$

55. (c): Cost price per kg of sugar = $\frac{240}{15} = 16$

$$\text{Discount offered by wholesaler} = \frac{4}{20} \times 100 = 20\%$$

Discount offered by retailer to customer =

$$\frac{75}{100} \times 20\% = 15\%$$

$$\text{Selling price of mixture} = (6 + 15) \times 20 \times \frac{85}{100}$$

$$= 357$$

$$\text{Profit \%} = \frac{357-240}{240} \times 100 = \frac{117}{240} \times 100 = 48.75\%$$

56. (b): Let, Amit and Sandeep invested Rs. 2x and Rs. 3x respectively.

ATQ,

$$2480 = \frac{3x \times 25 \times 2}{100} - 2x \left[\left(1 + \frac{20}{100} \right)^2 - 1 \right]$$

$$2480 = 1.5x - 0.88x$$

$$x = \frac{2480}{62} \times 100$$

$$x = 4000$$

Total amount earned after two years

$$= 2 \times 4000 \times \left[1 + \frac{20}{100} \right]^2 + 3 \times 4000 + \frac{3 \times 4000 \times 25 \times 2}{100}$$

$$= 11,520 + 12,000 + 6,000$$

$$= 29520$$

57. (b): Interest earned after 2 years from scheme A

$$= X \left[\left(1 + \frac{20}{100} \right)^2 - X \right]$$

$$= 1.44X - X$$

$$= 0.44X$$

Interest earned after 2 years from scheme E

$$= Y \left[1 + \frac{40}{100} \right]^2 - Y$$

$$= 1.96Y - Y$$

$$= 0.96Y$$

ATQ,

$$\frac{0.44X}{0.96Y} = \frac{1}{1}$$

$$\Rightarrow \frac{X}{Y} = \frac{24}{11}$$

58. (d): Interest earned from scheme 'C'

$$= \frac{X \times 15 \times 2}{100} = 0.3X$$

Interest earned from scheme 'D'

$$= 1.3X \left[\left(1 + \frac{10}{100} \right)^3 - 1 \right]$$

$$= 1.3X [0.331]$$

$$= 0.4303X$$

ATQ,

$$0.4303X - 0.3X = 31,272$$

$$0.1303X = 31,272$$

$$\Rightarrow X = 2,40,000$$

$$\Rightarrow 2x = 4,80,000$$

59. (b): Let, amount invested in scheme 'E' is for 'Y' months

ATQ,

$$8x + \frac{8x \times 25 \times 6}{100} = 5x + \frac{5x \times 40 \times Y}{100}$$

$$20x - 5x = 5x \times \frac{2}{5} \times Y$$

$$\Rightarrow 15x = 5x \times \frac{2}{5} \times Y$$

$$\Rightarrow Y = 7.5 \text{ years}$$

60. (a): Interest from scheme 'A' = $\frac{5x \times 20}{100} = x$

$$\text{Interest from scheme 'B'} = \frac{4x \times 25}{100} = x$$

$$\text{Interest from scheme 'C'} = \frac{3x \times 15}{100} = 0.45x$$

$$\text{Interest from scheme 'D'} = \frac{2x \times 10}{100} = 0.2x$$

$$\text{Interest from scheme 'E'} = \frac{x \times 40}{100} = 0.4x$$

Solutions (61-65)

Let 'x' km is distance travelled by all five boats and 'y' km/hr be the speed of stream
 Speed of boat A in upstream = $12 - y - y = 12 - 2y$ km/hr
 Speed of boat B in upstream = $10 - y - y = 10 - 2y$ km/hr
 Now,
 $x = 12(12 - 2y)$
 and $x = 24(10 - 2y)$
 $\Rightarrow 12(12 - 2y) = 24(10 - 2y)$
 $12 - 2y = 20 - 4y$
 $\Rightarrow y = \frac{8}{2} = 4$ km/hr
 and $x = 12(12 - 8) = 12 \times 4 = 48$ km.

Boat	Still water speed	upstream	downstream
A	8	4	12
B	6	2	10
C	12	8	16
D	10	6	14
E	16	12	20

61. (e): There can be two cases. Stream is flowing from P to Q or from Q to P.

First case - From P to Q, boat 'A' will travel in downstream and boat 'E' will travel in upstream.

Relative speed = $12 + 12 = 24$

They will meet first time = $\frac{240}{24} = 10$ hours

After that boat A will reach point Q and E will reach point P after $\frac{120}{12}$, 10 hours.

Now, boat A starts from point 'Q' and boat 'E' starts from 'P' and they will meet

= $\frac{240}{20+4} = 10$ hours

Total time taken = $10 + 10 + 10 = 30$ hours

Second case - From Q to P, boat 'A' travel in upstream and boat 'E' travel in downstream.

Speed of boat 'A' = 4 km/hr and Speed of boat 'E' = 20 km/hr

They will meet at first time = $\frac{240}{24} = 10$ hours.

Distance covered by boat 'A' in 10 hours = 40 km

Distance covered by boat 'E' in 10 hours = 200 km

Boat 'E' will reach point 'P' in $\frac{40}{20} = 2$ hours

In these 2 hours, Distance covered by Boat 'A' = $4 \times 2 = 8$ km

Now Boat 'E' will move towards point 'Q' so, boat 'E' will travel in upstream

Distance between Boat 'A' and boat 'E' = $40 + 8 = 48$ km

Time to cover 48 km distance = $\frac{48}{12-4} = \frac{48}{8} =$

6 hours

Total time to meet second time = $10 + 2 + 6 = 18$ hours

62. (b): Time taken by boat B to cover 80 km in downstream

$$= \frac{80}{10} = 8 \text{ hours}$$

Time taken by boat C to cover 48 km in upstream

$$= \frac{48}{8} = 6 \text{ hours}$$

$$\text{Required \%} = \frac{8-6}{6} \times 100$$

$$= \frac{2}{6} \times 100 = 33 \frac{1}{3} \%$$

63. (e): Required difference = $12 - 6 = 6$ km/hr

64. (b): Relative speed of boat 'C' and boat 'E'

$$= 20 - 16 \text{ or } 12 - 8 = 4 \text{ km/hr}$$

Required time when they will meet second time

$$= 2 \times \frac{48}{4} = 24 \text{ hours}$$

65. (d): Required average = $\frac{1}{3}(8 + 6 + 10)$

$$= \frac{24}{3} = 8 \text{ km/hr}$$

66. (d): Let Vikas invested Rs. 100x as a principal after two years, he was having Rs. 121x.

And then he invested his 121x for 2 years.

In 2 years, bank of Karan provides interest of 44%.

It means total amount with him after further to 2 years is

$$121x \left[\frac{144}{100} \right] = 121x \left[\frac{36}{25} \right]$$

$$= \frac{4356}{25} x$$

$$= 174.24x$$

$$\text{Required \%} = \frac{174.24x}{100x} \times 100 = 174.24\%$$

67. (e): Resultant % of 44% on Principal is obtained in two cases, either 20% in CI or 22% in SI.

If it was C.I.

Let he invest Rs. 100x.

ATQ,

$$100x \left[1 + \frac{20}{100} \right]^3 - 144x = 6336$$

$$\Rightarrow 100x \times \frac{216}{125} - 144x = 6336$$

$$\Rightarrow 172.8x - 144x = 6336$$

$$\Rightarrow 28.8x = 6336$$

$$x = 220.$$

He invested Rs. 22,000.

If it was S.I.

ATQ,

$$166x - 144x = 6336$$

$$22x = 6336$$

$$x = 288$$

$$100x = 28,800$$

So, it's either Rs. 22,000 or Rs. 28,800

68. (a): Amount obtained by Amar

$$= 25000 \left[1 + \frac{20}{100} \right]$$

$$= 30000$$

Ratio of amount of Amar & Prem

$$= 30000 : 24000$$

$$= 5 : 4$$

Let ROI of Amar is $4x$ and time is y .

and ROI of Prem is $5x$ and time is z .

$$y = \frac{20}{4x} = \frac{5}{x}$$

$$z = \frac{50}{5x} = \frac{10}{x}$$

$$y : z = 1 : 2$$

69. (b): Amount obtained by Amar

$$= 25000 \left[1 + \frac{20}{100} \right]$$

$$= 30000$$

$$\text{Karan invested Rs. } \frac{1}{3} \times 30000 = \text{Rs. } 10000$$

Amount obtained by Karan

$$= 10000 \left[1 + \frac{44}{100} \right]$$

$$= 14400$$

$$\text{Rahul Invested} = \frac{5}{6} \times 14400$$

$$= 12000/-$$

Amount obtained by Rahul

$$= \frac{145}{100} \times 12000$$

$$= \text{Rs. } 17400/-$$

$$\text{Required difference} = 17400 - 14400 = \text{Rs. } 3000/-$$

70. (e): Let Vikas invested Rs. $200x$

And Karan invested Rs. $100x$

If CI for 2 years is 44% for Karan.

It means his ROI is 20%.

Similarly, if CI for 2 year is 21% for Vikas it means ROI obtained by him is 10% p.a.

Amount with Karan after 1 year = $120x$

Amount with Vikas after 1 year = $220x$

Interest obtained by Karan in 2nd year

$$= 120x \times \frac{20}{100}$$

$$= 24x$$

Interest obtained by Vikas in 2nd year

$$= 220x \times \frac{10}{100}$$

$$= 22x$$

$$\Rightarrow 24x - 22x = 240$$

$$x = 120$$

\therefore Initial amount with Vikas = Rs. 24000

Amount with him after 3 years

$$= 24000 \times \left[1 + \frac{10}{100} \right]^3$$

$$= \text{Rs. } 31,944$$



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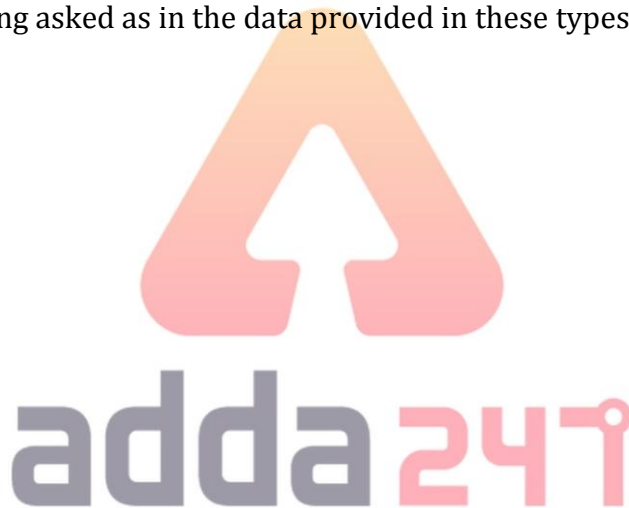
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Chapter 10

New Pattern DI

In the recent mains exams, we have seen that different types of DI's other than Pie, Line, bar & Table etc. are being asked. Some of these types of DI are Funnel DI, Scattered DI, Stock DI, Treemap DI, Box & Whisker DI etc.

As in the normal DI questions are being asked on the data provided in the graph, in the same way questions are being asked as in the data provided in these types of DI.



This chapter contains:

- Concept with Solved Examples
- Practice MCQs for Mains
- Previous Years' Questions of Mains

Solved Examples

Directions (1-3): Read the given information carefully and answer the following questions. This chart shows the various steps of loan disbursement i.e., from total population of the city to the number of people to whom loan are disbursed.

<input type="text"/>	Total population of the city: Y
<input type="text"/>	Total people approached for loan: X
<input type="text"/>	People who come for loan: 9600
<input type="text"/>	People eligible for loan: 30%
<input type="text"/>	People who applied for loan: 20%
<input type="text"/>	People to whom loan are disbursed: Z%

Note: All percentage values are given out of total people who are approached for loan.

- If Number of people who applied for loan but to whom loan are not disbursed is 400 and the people who are not eligible for loan among those who come for loan is 3600. Then find the number of people to whom loan are disbursed?
(a) 3200 (b) 3500 (c) 3600 (d) 3000 (e) 2500
- If the people who came for loan is 60% of total people approached for loan which is 40% of total population of city. The average of X, Y and Z is 20,000. Then, find people who are eligible for loan are what percent of Z?
(a) 105% (b) 110% (c) $112\frac{1}{2}\%$ (d) 116% (e) 120%
- If 8400 people are approached but did not come for loan then 30% of the total population of the city will approached for loan, then find what percent of the people who are eligible but not applied for loan out of total population of the city?
(a) $2\frac{1}{2}\%$ (b) 3% (c) $3\frac{1}{2}\%$ (d) 4% (e) $4\frac{1}{2}\%$

1. (c): ATQ,

$$9600 - \left(X \times \frac{30}{100}\right) = 3600$$

$$\Rightarrow X = 20000$$

$$\text{People who are eligible for loan} = \frac{20}{100} \times 20000 = 4000$$

$$\therefore \text{number of people to whom loan are disbursed} = 4000 - 400 = 3600.$$

2. (e): ATQ

$$X = \frac{9600}{60} \times 100 = 16000$$

$$Y = \frac{16000}{40} \times 100 = 40000$$

And

$$X + Y + Z = 20000 \times 3$$

$$Z = 60000 - 40000 - 16000$$

$$Z = 4000$$

$$\text{People who are eligible for loan} = 16000 \times \frac{30}{100} = 4800$$

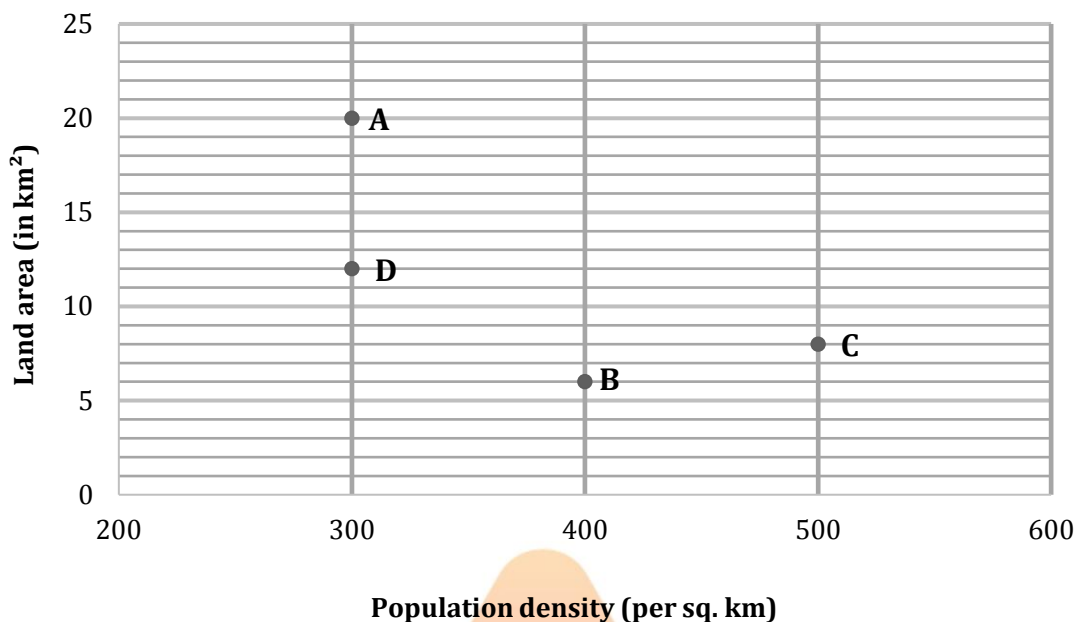
$$\text{Required percentage} = \frac{4800}{4000} \times 100 = 120\%$$

3. (b): total people who are approached for loan = 9600 + 8400 = 18000

$$\text{total population of the city} = \frac{18000}{30} \times 100 = 60000$$

$$\text{Required\%} = \frac{18000 \times \frac{10}{100}}{60000} \times 100 = 3\%$$

Directions (4-6): Study the following information carefully and answer the given questions. Given graph shows population density (in per Sq Km) and Land area (in sq km) of four different Villages A, B, C and D in the year 2001 are given.



(1) Population density = $\frac{\text{Total population of the village}}{\text{land area}}$

(2) Gender Ratio = $\frac{\text{Total number of males in a village}}{\text{Total number of female in a village}} \times 100$

4. Find gender Ratio of village A if the population of female in the village A is 2400?

- (a) 120 (b) 150 (c) 90 (d) 180 (e) 144

5. If total number of female populations in village A & C are equal and gender ratio of village A is 125 more than that of village C. Find number of males in village C.

- (a) 2000 (b) 2500 (c) 2200 (d) 2400 (e) 2600

6. In 2001, ratio of total population of B to that of E is 1 : 4. If the population density of E increases by 50% in 2010 then find population of E in 2010?

- (a) 14400 (b) 12000 (c) 16800 (d) 10000 (e) 15600

4. **(b):** male population in village A = $20 \times 300 - 2400 = 3600$

$$\text{Required gender ratio} = \frac{3600}{2400} \times 100 = 150$$

5. **(d):** Let number of female in village A be x.

So, the number of female in village C = x

Total population of village A = 6000.

Total population of village C = 4000

ATQ,

$$\frac{(6000-x)}{x} \times 100 = \left(\frac{4000-x}{x} \times 100 \right) + 125$$

$$\Rightarrow x = 1600$$

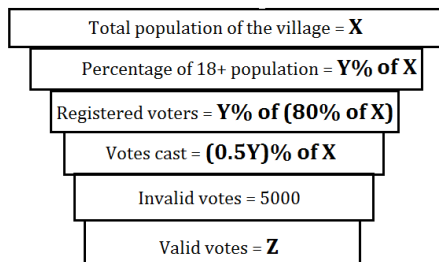
Number of male in village C = 2400

6. **(a):** total population of village B in 2001 = $6 \times 400 = 2400$

Total population of village E in 2001 = 9600

Population of E in 2010 = $9600 \times 1.5 = 14400$

Directions (7-10): Study the chart given below and answer the following questions.
Funnel chart shows the data regarding election held in a village.



Note – Total population of the village = 18+ years population of the village + (0-18) years population of the village.

- Voting age is 18 years.
- 7. If invalid votes cast in village are 2.5% of the total population of the village and ratio of 18+ population in village to valid votes cast in village is 11 : 5, then find voters who are not registered in the village?
(a) 45000 (b) 38000 (c) 22000
(d) Cannot be determined. (e) None of the above.
- 8. If difference between registered voters in the village and votes cast in the village is 120000 and 40% of the total population of the village cast their vote, then find valid votes cast in the village are what percent of (0-18) years population of the village?
(a) 85% (b) 195% (c) 125%
(d) 75% (e) Cannot be determined.
- 9. If number of voters who are not registered in the village is 36000 and ratio of total population in the village to valid votes cast in the village is 60 : 17, then find number of people who are under age of 18 years.
(a) 110000 (b) 150000 (c) 140000
(d) 120000 (e) Cannot be determined.
- 10. If number of registered voters in the village is 36000 and ratio of 18+ population in the village to votes cast in the village is 2 : 1, then find valid votes cast in the village are what percent of total population in the village?
(a) 35% (b) 39% (c) $28\frac{1}{3}\%$
(d) 25% (e) Cannot be determined.

7. (c): Total population of the village = $5000 \times \frac{100}{2.5}$
= 200000
Let 18+ population in village and valid votes cast in village be 11a and 5a respectively.

ATQ,

$$\frac{Y}{100} \times X = 11a$$

$$\frac{Y}{100} \times 200000 = 11a$$

$$\Rightarrow Y = \frac{11a}{2000} \quad \dots(i)$$

And,

$$Z = 5a$$

Now,

$$(0.5Y)\% \text{ of } X = 5000 + 5a$$

$$\frac{0.5Y}{100} \times 200000 = 5000 + 5a$$

$$\Rightarrow Y = \frac{1000+a}{200} \quad \dots(ii)$$

On solving (i) & (ii), we get:

$$a = 10000, Y = 55$$

$$\text{Hence, voters who are not registered in the village} = \left(X \times \frac{Y}{100}\right) - \left(\frac{Y}{100} \times \left(\frac{80}{100} \times X\right)\right)$$

$$= \left(200000 \times \frac{55}{100}\right) - \left(\frac{55}{100} \times \left(\frac{80}{100} \times 200000\right)\right)$$

$$= 110000 - 88000 = 22000$$

8. (b): ATQ,

$$\left(\frac{Y}{100} \times \left(\frac{80}{100} \times X\right)\right) - \left(\frac{0.5Y}{100} \times X\right) = 120000$$

$$\Rightarrow \frac{4XY}{500} - \frac{XY}{200} = 120000$$

$$\Rightarrow \frac{XY}{100} \left(\frac{4}{5} - \frac{1}{2}\right) = 120000$$

$$\Rightarrow XY = 40000000 \dots (i)$$

And,

$$\frac{40}{100} \times X = \frac{(0.5Y)}{100} \times X$$

$$\Rightarrow Y = 80$$

Put value of Y in (i):

$$X = 500000$$

$$\text{So, valid votes cast in the village} = \left(\frac{0.5Y}{100} \times X\right) - 5000$$

$$= \frac{0.5 \times 80 \times 500000}{100} - 5000$$

$$= 200000 - 5000$$

$$= 195000$$

$$(0-18) \text{ years population of the village} = X - \left(\frac{Y}{100} \times X\right)$$

$$= 500000 - \left(\frac{80}{100} \times 500000\right)$$

$$= 100000$$

$$\text{Required \%} = \frac{195000}{100000} \times 100 = 195\%$$

9. (d): ATQ,

$$\left(\frac{Y}{100} \times X\right) - \left(\frac{Y}{100} \times \left(\frac{80}{100} \times X\right)\right) = 36000$$

$$\Rightarrow \frac{XY}{100} - \frac{4XY}{500} = 36000$$

$$\Rightarrow \frac{XY}{100} \left(1 - \frac{4}{5}\right) = 36000$$

$$\Rightarrow XY = 18000000 \dots (i)$$

$$\text{Valid votes cast in the village} = \left(\frac{0.5Y}{100} \times X\right) - 5000$$

Now,

$$\frac{X}{\left(\frac{0.5Y}{100} \times X\right) - 5000} = \frac{60}{17}$$

$$\Rightarrow \frac{200X}{XY - 1000000} = \frac{60}{17}$$

$$\Rightarrow 340X = 6XY - 6000000 \dots (ii)$$

On solving, (i) & (ii), we get:

$$X = 300000, Y = 60$$

$$\text{Required voters (under 18 years)} = X - \frac{XY}{100}$$

$$= 300000 - \frac{18000000}{100} = 120000$$

10. (e): ATQ,

$$\frac{Y}{100} \times \left(\frac{80}{100} \times X\right) = 36000$$

$$\Rightarrow XY = 4500000 \dots (i)$$

And,

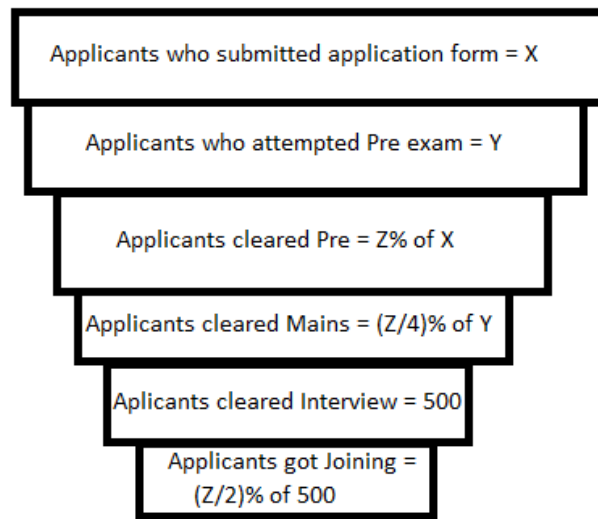
$$\frac{\frac{Y}{100} \times X}{\frac{0.5Y}{100} \times X} = \frac{2}{1}$$

It can't be solved further. So, answer cannot be determined.

Practice MCQs for Mains

Directions (1-5): Given below funnel chart shows the data of applicants applying and clearing IBPS RRB PO exam. Study the data carefully and answer the questions.

(Some data is missing which you have to find using the information provided in the questions)



- If 200 applicants got their joining and ratio of total applicants who submitted application form to applicants who cleared Interview is 20:1, then find how many applicants have cleared their Pre exam?
(a) 9500 (b) 7000 (c) 9000 (d) 8000 (e) 8500
- If 9000 applicants attempted Pre exam, out of which $\frac{1}{5}$ th cleared Mains. What is the ratio of applicants attempted Pre to those who did not get joining?
(a) 30:1 (b) 45:1 (c) 18:1 (d) 5:4 (e) 90:1
- If 225 applicants got joining out of 900 applicants who cleared Mains, then what can be the possible value of X?
(a) 4500 (b) 3600 (c) 2000 (d) 2500 (e) Cannot be determined
- If ratio of applicants who cleared Pre to those who cleared Mains is 6:1. What percent of total applicants who submitted application form cleared Mains, if $Z = 70$?
(a) $17\frac{1}{2}\%$ (b) $11\frac{2}{3}\%$ (c) $26\frac{1}{4}\%$ (d) None of these (e) Cannot be determined
- Applicants not clearing Interview are what percent more/less than applicants who attempted Pre but not qualified Pre, if total applicants who submitted application form are 20000 of which only 90% attempted Pre and applicants who got joining are 200?
(a) 35.48% (b) 55% (c) 42% (d) 50% (e) Cannot be determined

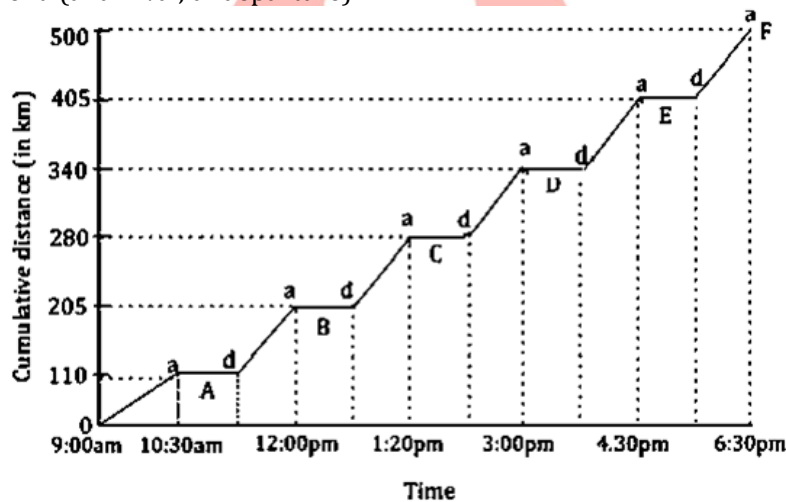
Direction (6 – 9) : Given below data shows data regarding a blood donation camp conducted in two village in two different years. Read the data carefully and answer the questions. Some people couldn't donate as they were reported with (suffering from) some diseases.

Note - All percentage values are given out of total population of respective village in each year.

2017			2018	
A	B		A	B
P	8000	→ Total population of village	9000	X
75%	87.5%	→ People registered for blood donation.	Z%	7500
3600	Q%	→ Number of people donated blood.	4200	Y%
50%	25%	→ Number of people found with disease.	M	25%
R%	S	→ Number of people suggested for Medical treatment	12%	10%

- (a). Total people suggest for immediate treatment in 2018 from village A are 180 more than that of people suggest for immediate treatment in 2017 from same village.
- (b). $X - (P + M) = 40Q + 400$ and $Q + Y = 2(Z - 20)$. (consider only numerical value)
- (c). Number of people donated blood from village B in 2018 is equal to total population of village A in 2017 which is equal to $(80Q + M)$ (consider only numerical value).
- (d). in 2019, number of people find with disease in 2018 from village A increased by 150% which is half of total population of village A in 2017.
- (e). Average number of people donate blood from B in both the given year is 5400.
- (f). Average of people find with disease but did not suggest to immediate treatment from B in both the given years is 1550.
6. Find the difference between people found with disease but did not suggest to immediate treatment from A in both the given years?
 (a) 1960 (b) 1980 (c) 1920 (d) 1880 (e) 1780
7. Find ratio of people found with disease but did not suggest to immediate treatment from village B in 2018 to number of people donated blood from B in 2017?
 (a) 9 : 16 (b) 1 : 16 (c) 3 : 16 (d) 5 : 16 (e) 7 : 16
8. Find difference between total population of village A in 2017 and total population of village B in 2018?
 (a) 2500 (b) 1500 (c) 2000 (d) 3000 (e) 4000
9. If population of B increased by 20% in 2019 over previous years and 75% people registered for blood donation, then find difference between average number of people registered for blood donation from A in 2017 & 2018 and total people registered for blood donation from B in 2019?
 (a) 2850 (b) 2950 (c) 3150 (d) 3100 (e) 3050

Direction (10-14): The following graph shows cumulative distance and time taken by an express train which starts from a particular station 'O' to station 'F' (Halt time is different for each station) and speed of train between every two consecutive station is different. (a- arrival, d- departure)



10. If the speed of train is equal between station B to C and between station C to D, then find halt time of train at station C. [train halt for 5 min at station B].
 (a) 40min (b) 45min (c) 50min (d) 54min (e) 35min
11. If train halts for 10 min at each station, then find average speed of the train maintained between in which two successive station was maximum?
 (a) O-A (b) A-B (c) B-C (d) D-E (e) E-F
12. If train halts for 10 min at each station, then find between how many pairs of consecutive station does the train run above the overall average speed of the entire journey?
 (a) 4 (b) 2 (c) 5 (d) 1 (e) 3
13. The average speed of train between station A and station D is how much % more or less than the average speed of the train during the entire journey. (in %)(approx.) (The train does not stop at station A i.e. no halt at A)
 (a) 26 (b) 25 (c) 15 (d) 3 (e) 9

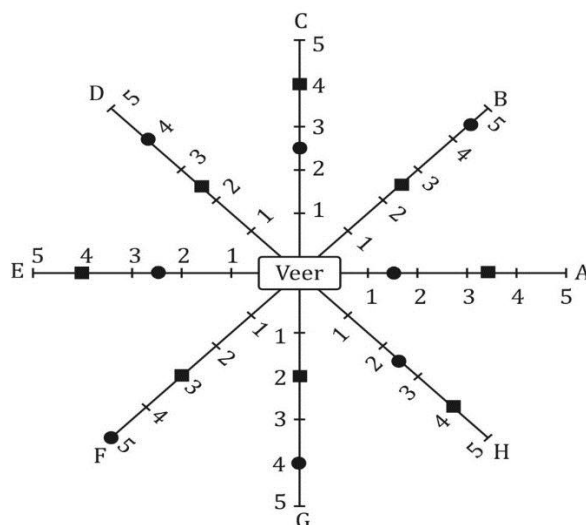
14. If due to some technical problem train speed got decreased to $\frac{5}{6}$ th of its usual speed between station B and station C, but it managed to reach the station D at time, then find by how much percent (approx.) it has to increase its speed during journey between C and D. [halt time for station B and C is 5 min and 25 min respectively.] (in %)
- (a) 32 (b) 35 (c) 25 (d) 29 (e) 21

Directions (15-17): Read the given information carefully and answer the following questions.

A, B, C, D, E, F, G and H are eight friends of Veer. The below diagram gives the distance between each one's house and Veer's house and time taken by Veer to reach their houses.

The circular dot represents the distance of a person's house from Veer's house (scale 1 division = 1.75 km)

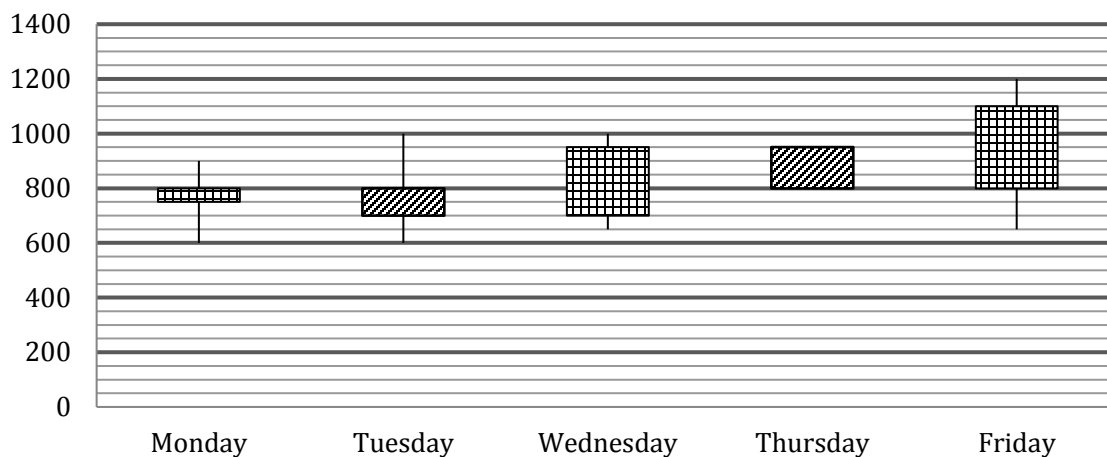
The square dot represents the time taken by Veer to reach a particular person's house starting from his house. (scale: 1 division = 1.2 hours)



15. How much more or less time will Veer take to reach F's house, if he travels at the speed at which he travels to H's house?
- (a) 5hr 48 min (b) 6hr (c) 6hr 12 min (d) 5hr 36 min (e) 6hr 18 min
16. If A's, Veer's and B's houses are in a straight line, then find the average of the maximum and minimum time taken by Veer to reach B's house if he initially travels towards A's house and he is travelling at 1.5 km/hr for entire journey?
- (a) 7hr 05 min (b) 7hr (c) 8hr 12 min (d) 7hr 15 min (e) 8hr
17. E, F and Veer live in a straight line, such that Veer stays between E and F. How much time (in minutes) will Veer take to travel to F's house from E's house at the speed at which he travels to B's house?
- (a) None of these (b) 4 hr 36 min (c) 5 hr 12 min (d) 4 hr 48 min (e) 5 hr

Directions (18-21): Study the chart given below carefully and answer the following questions.

OHLC (Open-High-Low-Close) chart given below shows data regarding trading in stock of company – X on 5 different days.



[NOTE:

- 1) Red Candle – Top end & bottom end represents opening & closing value of the share respectively of a particular day.
- 2) Green Candle – Top end & bottom end represents closing & opening value of the share respectively of a particular day.
- 3) Vertical line represents highest & lowest value of the share of a particular day.]

18. For how many instances in graph, the difference between opening value & highest value of the stock for the day is more than $23\frac{4}{9}\%$ the opening value of stock of that day?

- (a) 1 (b) 2 (c) 3 (d) 4 (e) 5

19. An individual purchased 1234 units of share at lowest price of day on Monday and sold them on Thursday at highest price of that day, then find the difference in profit/loss % if he sells his entire stock on Friday at closing price instead of Thursday?

- (a) 75% (b) 50% (c) 30% (d) 60% (e) 25%

20. If an individual sells an equal amount of share on Monday at lowest price, Tuesday at closing price, Wednesday at highest price, Thursday at lowest price and Friday at highest price then on which day the profit obtained was maximum? (On each day shares were purchased at opening price of that day)

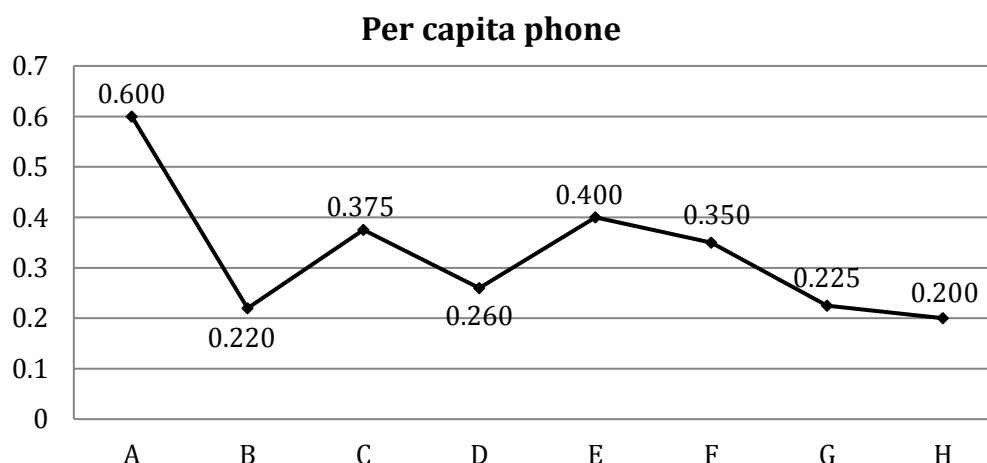
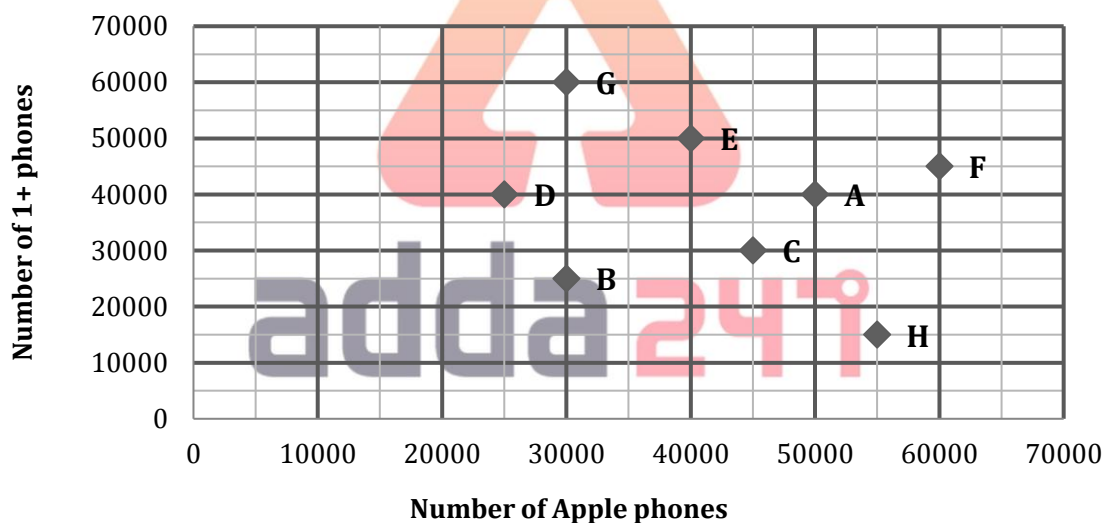
- (a) Monday (b) Tuesday (c) Wednesday (d) Thursday (e) Friday

21. On which day the difference between the opening value of each unit of share and the lowest value of each unit of share for that day is the lowest?

- (a) Monday (b) Tuesday (c) Wednesday (d) Thursday (e) Friday

Directions (22 – 24): Study the charts given below and answer the following questions.

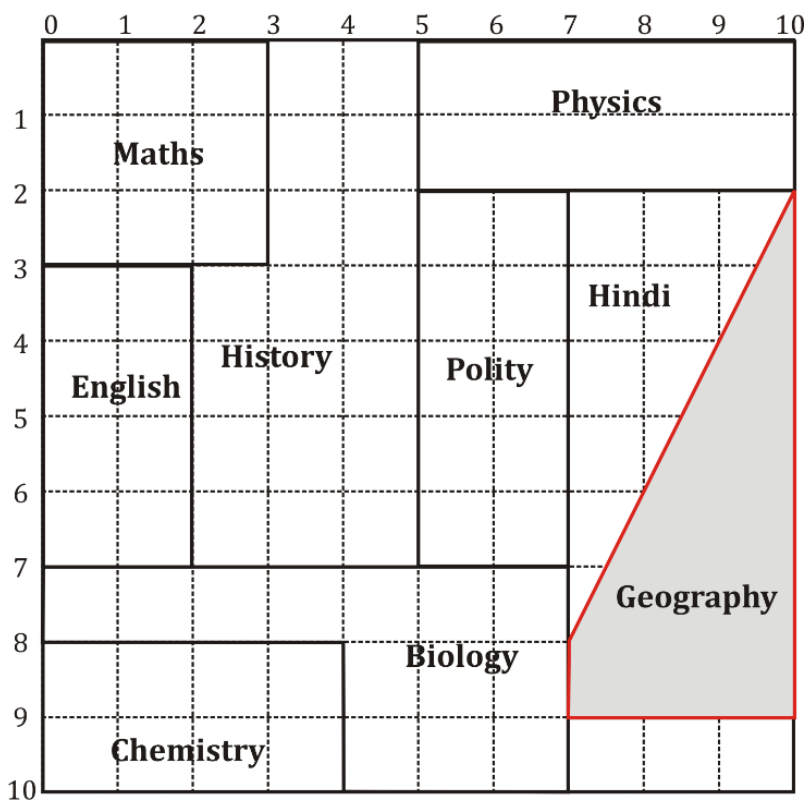
Charts given below shows the number of apple phones and 1+ phones in 8 different cities (A, B, C, D, E, F, G & H) and per capita phone in these 8 cities.



22. What is the total population of the cities in which number of apple phones are less than the number of 1+ phone?
 (a) 625000 (b) 975000 (c) 755000 (d) 875000 (e) 900000
23. If a person can have at most one phone in 7 cities out of the 8 cities and the number of persons who do not own a phone is not same for any two cities, then find which city can have the 5th highest number of people who do not own a phone?
 (a) C (b) F (c) D
 (d) B (e) Cannot be determined
24. If a person can have at most one phone in 7 cities out of the 8 cities and the number of persons who do not own a phone is 280000 in any two cities, then find in which city a person can have more than 1 phone?
 (a) G (b) D (c) B
 (d) Cannot be determined. (e) None of the above.

Directions (25-28): The above figure shows percentage of marks obtained out of total marks in nine different subjects by Ayush in nine different subjects.

Use: 1sq. unit = 5%



Maximum marks for each of nine subjects are given in the table

Subjects	Maths	Physics	English	History	Polity	Hindi	Biology	Chemistry	Geography
Maximum Marks	160	200	175	250	200	180	100	150	200

25. What is the approximate percentage of marks scored by Ayush in English, Hindi and Chemistry?
 (a) 50% (b) 45% (c) 48% (d) 42% (e) 36%
26. Find the ratio of marks obtained by Ayush in Geography & Physics together to the marks obtained by him in Maths & History together?
 (a) 220: 297 (b) 60: 79 (c) 5: 9 (d) 18: 29 (e) 15: 26
27. Which of the following pairs of subjects, Ayush has obtained maximum marks?
 (a) Physics & Maths (b) History & Biology (c) English & Geography
 (d) Hindi & polity (e) Physics & Chemistry.

28. Average age of a group of people is four times of the number of people in the group. Sakshi leaves the group and the average age is still four times of the number of people in the group. After that Sheetal leaves the group and the average age is still four times of the number of people in the group. If ratio between Sakshi's age to Sheetal's age is 21 : 19, then find the average age of the group if Ritu leaves the group whose age is 20 years.
 (a) 36 years (b) 37 years (c) 38 years (d) 39 years (e) 40 years

Practice MCQs for Mains_(Solutions)

1. (d): Applicants who got Joining = 200

$$\text{ATQ, } \frac{Z}{2}\% \text{ of } 500 = 200$$

$$Z = 80$$

Total applicants (applicants who submitted form)

$$= 500 \times \frac{20}{1} = 10000$$

Applicants cleared their Pre exam = Z% of X = 80% of X

$$= \frac{80}{100} \times 10000 = 8000$$

2. (a): Applicants attempted Pre = Y = 9000

$$\text{Applicants cleared Mains} = \frac{1}{5} \times 9000 = 1800$$

$$\text{ATQ, } \frac{Z}{4}\% \text{ of } Y = 1800$$

$$Z = 80$$

Applicants who did not get Joining = 500 -

$$\frac{Z}{2}\% \text{ of } 500 = 500 - 40\% \text{ of } 500 = 300$$

$$\text{Required ratio} = \frac{9000}{300} = 30:1$$

3. (a): Applicants got Joining = 225

$$\text{ATQ, } \frac{Z}{2}\% \text{ of } 500 = 225$$

$$Z = 90$$

Applicants who cleared Mains = 900

$$\frac{Z}{4}\% \text{ of } Y = 900$$

$$Y = 4000$$

We know, total applicants who submitted application form are X, while applicants who attempted Pre exam are Y. So, 4500 can be the only possible value of X, as $X \geq Y$.

4. (b): $\frac{\text{applicants who cleared Pre}}{\text{applicants who cleared Mains}} = \frac{6}{1}$

$$\frac{\frac{Z}{2}\% \text{ of } X}{\frac{Z}{4}\% \text{ of } Y} = \frac{6}{1}$$

$$\frac{X}{Y} = \frac{3}{2}$$

$$\text{Given } Z=70$$

$$\text{Required percent} = \frac{\frac{Z}{4}\% \text{ of } Y}{X} \times 100 = \frac{70 \times Y}{4 \times 100 \times X} \times 100$$

$$100 = \frac{35Y}{2X}\%$$

$$= \frac{35 \times 2}{2 \times 3} = 11\frac{2}{3}\%$$

5. (b): Total applicants = X = 20000

$$\text{Applicants who attempted Pre} = Y = 90\% \text{ of } 20000 = 18000$$

Applicants who got joining = 200

$$\frac{Z}{2}\% \text{ of } 500 = 200$$

$$Z = 80$$

$$\text{Applicants not clearing interview} = \frac{Z}{4}\% \text{ of } Y =$$

$$500 = \frac{80}{4}\% \text{ of } 18000 - 500 = 3100$$

$$\text{Applicants not clearing Pre} = Y - Z\% \text{ of } X = 18000 - 80\% \text{ of } 20000 = 2000$$

$$\text{Required } \% = \frac{3100 - 2000}{2000} \times 100 = 55\%$$

Sol (6 - 9):

$$\text{From (a)} \quad 12\% \text{ of } 9000 = \frac{RP}{100} + 180$$

$$RP = 90000 \quad \dots\dots\dots(1)$$

From (b)

$$X - (P + M) = 40Q + 400 \quad \dots\dots\dots(2)$$

$$Q + Y = 2(Z - 20) \quad \dots\dots\dots(3)$$

From (c)

$$\frac{XY}{100} = P \quad \dots\dots\dots(4)$$

$$P = 80Q + M \quad \dots\dots\dots(5)$$

From (d)

$$\frac{250}{100} \times M = \frac{P}{2}$$

$$P = 5M \quad \dots\dots\dots(6)$$

From (e)

$$80Q + \frac{XY}{100} = 10800$$

$$80Q + P = 10800 \quad \dots\dots\dots(7)$$

From (f)

$$2000 - S + \frac{15}{100}X = 3100 \quad \dots\dots\dots(8)$$

Using (6)

$$\text{Let } P = 5K \text{ so, } M = K$$

Using (5)

$$Q = \frac{4K}{80} = \frac{K}{20}$$

$$P : M : Q = 100 : 20 : 1$$

$$\text{Or } P : M : Q = 100a : 20a : a$$

Using (7)

$$80a + 100a = 10800$$

$$a = 60$$

$$\text{So, } P = 6000$$

$$M = 1200$$

$$Q = 60$$

Using (1)

$$R = 15$$

Using (2)

$$X - 7200 = 40 \times 60 + 400$$

$$X = 10000$$

Using (4)

$$Y = \frac{6000 \times 100}{10000} = 60$$

Using (8)

$$2000 - S + \frac{15}{100} \times 10000 = 3100$$

$$S = 400$$

From (3)

$$2Z = 180, Z = 80$$

6. (b): Number of people suggest to immediate treatment from A in the years 2017

$$= 6000 \times \frac{15}{100} = 900$$

So, people found with disease but did not suggest to immediate treatment from A in 2017

$$= 6000 \times \frac{50}{100} - 900 = 2100$$

Number of people found with disease from A in 2018 = 1200

So, people found with disease but did not suggest to immediate treatment from A in 2018

$$= 1200 - 9000 \times \frac{12}{100} = 120$$

$$\text{Required difference} = 2100 - 120 = 1980$$

7. (d): People found with disease but did not suggested to immediate treatment from village B in 2018 =

$$10000 \times \frac{25}{100} - 10000 \times \frac{10}{100} = 1500$$

Number of people donate blood from B in 2017

$$= 8000 \times \frac{60}{100} = 4800$$

$$\text{Required ratio} = \frac{1500}{4800} = 5 : 16$$

8. (e): Required difference = $10000 - 6000 = 4000$

9. (c): Total people registered for blood donation from B in 2019 = $10000 \times \frac{120}{100} \times \frac{75}{100} = 9000$

Number of people registered for blood donation from A in 2017 & 2018

$$= 6000 \times \frac{75}{100} + 9000 \times \frac{80}{100}$$

$$= 11700$$

$$\text{Required difference} = 9000 - \frac{11700}{2} = 3150$$

10. (a): departure time from station B = 12:05 PM

Arrival time at station C = 1:20 PM

Speed of train between stations B & C = $75/1.25 = 60$ kmph

Speed of train between stations C & D = 60 kmph

Time taken by train from station C to D = $60/60 = 1$ hour

Arrival time at station D = 3:00 PM

Departure time from station C = 2:00 PM

Halt time at station C = 2:00PM - 1:20PM

= 40 minutes.

11. (a): speed of train between two successive stations

$$\text{Origin - A} = \frac{110}{1.5} = 73.33 \text{ kmph}$$

$$\text{A - B} = 95 \times \frac{3}{4} = 71.25 \text{ kmph}$$

$$\text{B - C} = 75 \times \frac{6}{7} = 64.29 \text{ kmph}$$

$$\text{C - D} = 60 \times \frac{2}{3} = 40 \text{ kmph}$$

$$\text{D - E} = 65 \times \frac{3}{4} = 48.75 \text{ kmph}$$

$$\text{E - F} = 95 \times \frac{6}{11} = 51.81 \text{ kmph}$$

So, the average speed of train was maximum in between O - A.

12. (e): Average speed = $500 \times \frac{2}{19} \approx 52.65 \text{ kmph}$

Speed of train between two consecutive station =

$$\text{Origin - A} = \frac{110}{1.5} = 73.33 \text{ kmph}$$

$$\text{A - B} = 95 \times \frac{3}{4} = 71.25 \text{ kmph}$$

$$\text{B - C} = 75 \times \frac{6}{7} = 64.29 \text{ kmph}$$

$$\text{C - D} = 60 \times \frac{2}{3} = 40 \text{ kmph}$$

$$\text{D - E} = 65 \times \frac{3}{4} = 48.75 \text{ kmph}$$

$$\text{E - F} = 95 \times \frac{6}{11} = 51.81 \text{ kmph}$$

Speed of train between two consecutive stations is more than the average speed of train for 3 stations.

13. (d): average speed of train from station A to D = $230/4.5 = 51.11 \text{ kmph}$

Average speed of train for whole journey

$$= 500/9.5 = 52.65 \text{ kmph}$$

$$\text{Required \%} = (52.65 - 51.11) \times \frac{100}{52.65} = 2.9\% \approx 3\%$$

14. (c): reduced speed of train from station B to C

$$= 60 \times 5/6 = 50 \text{ kmph}$$

Time at which train leaves station B = 12:05 PM

Time to reach at station C = $75/50 = 1.5$ hour

Actual time at which train reaches station C

$$= 12:05 + 1:30 = 1:35 \text{ PM}$$

Actual Time of departure from C = 2:00 PM

Now train to reach D on time, its speed must be increased

$$\text{New speed} = \frac{60}{1} = 60 \text{ kmph}$$

$$\text{Actual speed from station C to D} = \frac{60}{1.25} = 48 \text{ kmph}$$

Required increase in speed

$$= (60 - 48) \times \frac{100}{48} = 25\%$$

Sol (15-17):

A	B	C	D	E	F	G	H
2.625 km	7.875 km	4.375 km	7 km	4.375 km	8.75 km	7 km	4.375 km
4 h 12 min	3 h	4 h 48 min	3 h	4 h 48 min	3 h 36 min	2 h 24 min	4 h 48 min

15. (b): Speed at which Veer travels to H's house

$$= \frac{4.375}{4.8} = \frac{4375}{4800} \text{ km/hr}$$

$$\text{Time taken to reach F's house} = \frac{8.75}{4375} \times 4800 = 9.6 \text{ hr}$$

$$\text{Required time} = 9.6 - \frac{8.75}{3.6} = 6 \text{ hr}$$

16. (b): Case I: A's house Veer's house
B's house

Total distance travelled by Veer in order to reach B's house = 2(distance between A's and Veer's house) + (distance between Veer's and B's house)
 $= 2 \times 2.625 + 7.875 = 13.125 \text{ km}$

$$\text{Required time} = \frac{13.125}{1.5} \text{ hr} = 8.75 \text{ hr}$$

Case II: Veer's house A's house
B's house

Total distance travelled by Veer in order to reach B's house = (Distance between Veer's and A's house) + (Distance between A's and B's house) = Distance between Veer's and B's house = 7.875 km

$$\text{Required time} = \frac{7.875}{1.5} = 5.25 \text{ hr}$$

$$\text{Required average} = \frac{8.75 + 5.25}{2} = 7 \text{ hr}$$

17. (e): Total distance travelled by Veer in order to reach F's house from E's house = Distance between Veer's and F's house + distance between Veer's and E's house = 8.75 + 4.375 = 13.125 km

$$\text{Speed at which he travels to B's house} = \frac{7.875}{3} = 2.625 \text{ km/h}$$

$$\text{Required time} = \frac{13.125}{2.625} = 5 \text{ hr}$$

18. (c): ATQ,

$$\text{On Monday} = \frac{900-750}{750} \times 100 = 20\% \text{ more}$$

$$\text{On Tuesday} = \frac{1000-800}{800} \times 100 = 25\% \text{ more}$$

$$\text{On Wednesday} = \frac{1000-700}{700} \times 100 = 42\frac{6}{7}\% \text{ more}$$

$$\text{On Thursday} = \frac{950-950}{950} \times 100 = 0\%$$

$$\text{On Friday} = \frac{1200-800}{800} \times 100 = 50\% \text{ more}$$

$$\text{Required number of instances} = 3$$

19. (e): Cost price of 1234 units of share for individual (on Monday) = 1234 × 600 = Rs.740,400

$$\text{Required difference in \%} = \frac{(1100-950) \times 1234}{740400} \times 100 = 25\%$$

20. (e): ATQ,

Profit/loss earned on Monday

$$= 600 - 750 = \text{Rs.150 loss}$$

Profit/loss earned on Tuesday

$$= 700 - 800 = \text{Rs.100 loss}$$

Profit/loss earned on Wednesday

$$= 1000 - 700 = \text{Rs.300 profit}$$

Profit/loss earned on Thursday

$$= 800 - 950 = \text{Rs.150 loss}$$

Profit/loss earned on Friday

$$= 1200 - 800 = \text{Rs.400 profit}$$

21. (c): ATQ,

$$\text{On Monday} = 750 - 600 = \text{Rs. 150}$$

$$\text{On Tuesday} = 800 - 600 = \text{Rs. 200}$$

$$\text{On Wednesday} = 700 - 650 = \text{Rs. 50}$$

$$\text{On Thursday} = 950 - 800 = \text{Rs. 150}$$

$$\text{On Friday} = 800 - 650 = \text{Rs. 150}$$

Required day is Wednesday.

Sol (22-24):

$$\text{Total population of city A} = \frac{50000+40000}{0.600} = 150000$$

$$\text{Total population of city B} = \frac{30000+25000}{0.220} = 250000$$

$$\text{Total population of city C} = \frac{45000+30000}{0.375} = 200000$$

$$\text{Total population of city D} = \frac{25000+40000}{0.260} = 250000$$

$$\text{Total population of city E} = \frac{40000+50000}{0.400} = 225000$$

$$\text{Total population of city F} = \frac{60000+45000}{0.350} = 300000$$

$$\text{Total population of city G} = \frac{30000+60000}{0.225} = 400000$$

$$\text{Total population of city H} = \frac{55000+15000}{0.200} = 350000$$

22. (d): Cities in which number of apple phones are less than the number of 1+ phones = (D, E & G)

$$\text{Population in city - D} = \frac{25000+40000}{0.260} = 250000$$

$$\text{Population in city - E} = \frac{40000+50000}{0.400} = 225000$$

$$\text{Population in city - G} = \frac{30000+60000}{0.225} = 400000$$

$$\text{Required population} = 250000 + 225000 + 400000 = 875000$$

23. (c): ATQ,

City	Total Population	People without phone
A	150000	60000
B	250000	195000
C	200000	125000
D	250000	185000
E	225000	135000
F	300000	195000
G	400000	310000
H	350000	280000

In the table, people without phone are same for city – B & F and this is not possible as it is clearly mentioned in the question that the number of persons who do not own a phone is not same for any two cities. So, either in city – B or city – F at least 1 person is using more than 1 phone.

If in city – B at least 1 person is using more than 1 phone, then city – B has the 3rd highest number of people who do not own a phone and city – F has the 4th highest number of people who do not own a phone.

If in city – F at least 1 person is using more than 1 phone, then city – F has the 3rd highest number of people who do not own a phone and city – B has the 4th highest number of people who do not own a phone.

Hence, city – D has the 5th highest number of people who do not own a phone.

24. (e): ATQ,

City	Total Population	People without phone
A	150000	60000
B	250000	195000
C	200000	125000
D	250000	185000
E	225000	135000
F	300000	195000
G	400000	310000
H	350000	280000

In city – A, if only 1 person have all phone, then maximum number of persons who do not have a phone in city – A are 149999.

In city – B, if only 1 person have all phone, then maximum number of persons who do not have a phone in city – B are 249999.

In city – C, if only 1 person have all phone, then maximum number of persons who do not have a phone in city – C are 199999.

In city – D, if only 1 person have all phone, then maximum number of persons who do not have a phone in city – D are 249999.

In city – E, if only 1 person have all phone, then maximum number of persons who do not have a phone in city – E are 224999.

In city – F, if only 1 person have all phone, then maximum number of persons who do not have a phone in city – F are 299999.

In city – G, if at least 1 person have more than 1 phone, then minimum number of person who do not have a phone in city – G are 310001.

Hence, in city – F a person can have more than 1 phone.

25. (d): marks obtained in English = $175 \times \frac{8 \times 5}{100} = 70$

Marks obtained in Hindi = $180 \times \frac{9 \times 5}{100} = 81$

Marks obtained in Chemistry = $150 \times \frac{8 \times 5}{100} = 60$

Required% = $\frac{(60+70+81)}{(175+180+150)} \times 100 \approx 42\%$

26. (a): Total marks obtained by him in Geography & physics together

= $\frac{12 \times 5}{100} \times 200 + 200 \times \frac{10 \times 5}{100} = 120 + 100 = 220$

Total marks obtained by him in Maths & History together

= $\frac{9 \times 160 \times 5}{100} + \frac{250 \times 18 \times 5}{100} = 72 + 225 = 297$

Required ratio = $\frac{220}{297}$

27. (b): Total marks obtained in Physics & Maths

= $\frac{200 \times 10 \times 5}{100} + \frac{160 \times 9 \times 5}{100} = 172$

Total marks obtained in History & Biology

= $\frac{250 \times 18 \times 5}{100} + \frac{100 \times 13 \times 5}{100} = 290$

Total marks obtained in English & Geography

= $\frac{175 \times 8 \times 5}{100} + \frac{200 \times 12 \times 5}{100} = 190$

Total marks obtained in Hindi & polity

= $\frac{180 \times 9 \times 5}{100} + \frac{200 \times 10 \times 5}{100} = 181$

Total marks obtained in physics & chemistry

= $\frac{200 \times 10 \times 5}{100} + \frac{150 \times 8 \times 5}{100} = 160$

28. (c): Let, initial Number of people in the group be 'n'.

Let $21x$ and $19x$ be ages of Sakshi and Sheetal respectively,

A.T.Q.,

$4n^2 - 21x = 4(n - 1)^2$ (i)

And $4n^2 - 21x - 19x = 4(n - 2)^2$

$4n^2 - 40x = 4(n - 2)^2$ (ii)

Solving (i) and (ii),

$x = 4, n = 11$

Average age of group after Ritu leaves the group

= $\frac{4 \times 11^2 - 21 \times 4 - 19 \times 4 - 20}{11 - 3} = \frac{304}{8} = 38$

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Previous Years' Questions of Mains

Directions (1 – 5): Given graph shows the number of orders received and cancelled on particular days of a week (From Monday to Saturday) while the table shows the number of orders which were not delivered. Read the data carefully and answer the questions.

(NOTE: Refer Y-Axis values as number of orders while X-Axis values as Days i.e. 20 = Monday, 40 = Tuesday and so on)
(Orders continued are those which are not cancelled)

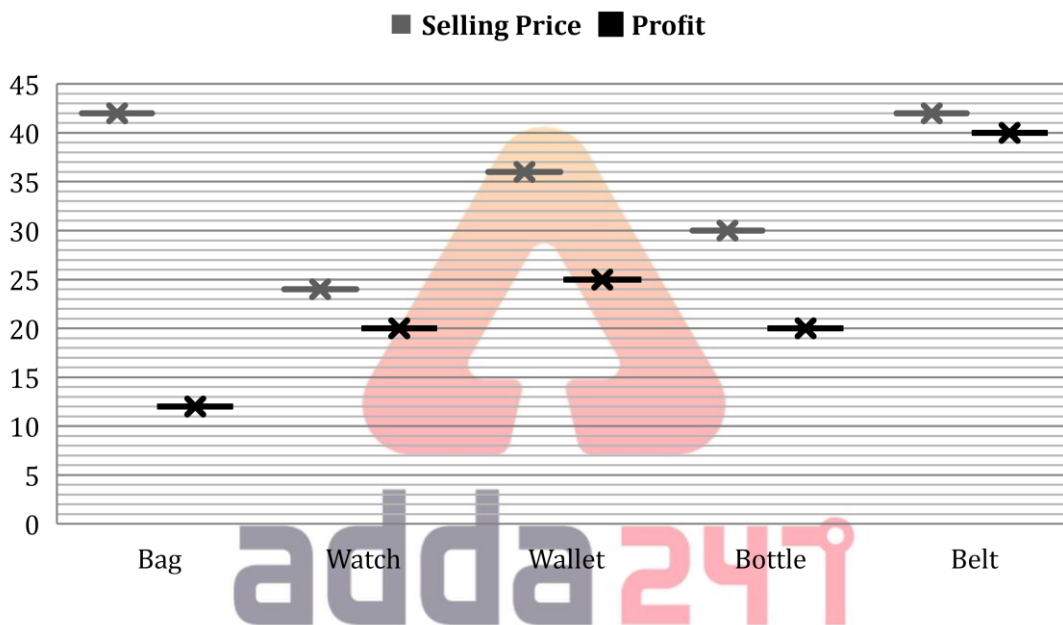


Number of orders not delivered	
Monday	120
Tuesday	80
Wednesday	160
Thursday	300
Friday	200
Saturday	120

- what is the difference between number of orders delivered on Monday & Wednesday together and number of orders booked on Wednesday & Thursday together?
(a) 300 (b) 280 (c) 320 (d) 240 (e) 260
- if orders booked on Tuesday are 50 more than that of Saturday while the difference between orders not delivered on both days is same as difference between orders delivered on same days then by what percent orders cancelled on Tuesday are more/less than orders cancelled on Friday?
(a) 51.75% (b) 56.25% (c) 59.25% (d) 53.75% (e) 62.5%
- if total orders received on last 3 days are 150 more than total orders received on first 3 days and orders delivered on Friday are more than that on Saturday then what can be the difference between orders cancelled on Saturday and orders delivered on Thursday?
A. 28 B. 49 C. 23 D. 40 E. 17 F. 37
(a) A, C, E (b) A, C, F (c) B, D, F (d) all of these (e) A, C, D, E, F
- if orders delivered on Tuesday are $33\frac{1}{3}\%$ less than orders booked on Thursday while average of orders delivered on Friday & Saturday is 195 and orders booked on Friday are more than orders booked on Saturday then which of the following is definitely true?
(a) orders cancelled on Tuesday are more than that on Friday.

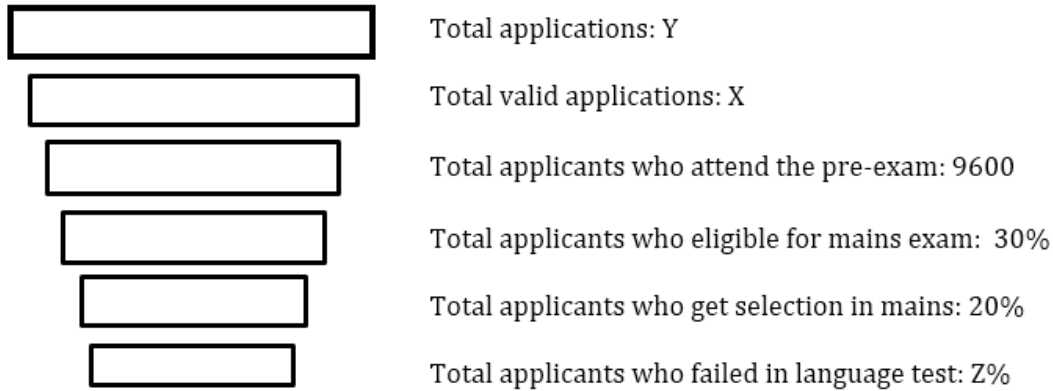
- (b) difference between orders cancelled on Tuesday & Saturday 322.
 (c) orders delivered on Friday are always more than orders received on Wednesday.
 (d) difference between orders delivered on Monday & Friday can be zero.
 (e) more number of orders were cancelled on Friday than number of orders not delivered on Friday.
5. if ratio of orders received on Thursday & Friday together to orders delivered on Monday, Wednesday & Saturday together is 65 : 34 and orders cancelled on Tuesday are 10% less than that on Wednesday and orders cancelled on Saturday is same as difference between orders not delivered on Friday and orders cancelled on Tuesday then how many total orders were booked in whole week?
- (a) 2850 (b) 2450 (c) 2280 (d) None of these (e) 2170

Direction (6-10)- Graph given below shows the selling price (in rupees) of a single unit of five different products for a shopkeeper and also the profit percent of on a single unit of these product. Study the graph carefully and answer the question given below.



6. If a man purchased ten bags and six bottles from the shopkeeper, then find the profit made by the shopkeeper on the given number of bags and bottles?
- (a) None of these (b) $12\frac{1}{2}\%$ (c) 14% (d) $16\frac{2}{3}\%$ (e) $14\frac{2}{7}\%$
7. If a man purchased four wallets and sold two of them at 25% loss and rest at 12.5% profit. Then find the net profit or loss obtained by the man.
- (a) Rs. 14 (b) Rs. 9 (c) Rs. 6 (d) Rs. 12 (e) none of these
8. What is the average of cost price of all five items, if single item is considered? (
- (a) 28.26 Rs. (b) 23.25 Rs. (c) 32.28 Rs. (d) 18 Rs. (e) None of these
9. If shopkeeper also wants to sell five tiffin, the cost price of single tiffin is same as cost price of single watch and made a total profit of 50%. Then find the average of selling price of single tiffin and cost price of single bottle?
- (a) 27.5 (b) None of these (c) 22.5 (d) 18 (e) 15
10. If A and B made profit by selling five belts each whose ratio of selling price is 3 : 2 and cost price of one belt is Rs. 30. If profit made by both is equal to profit made by shopkeeper on selling five bags. Then find the difference of selling price of A and B?
- (a) Rs. 12.9 (b) Rs. 16.4 (c) Rs. 8.06 (d) Rs. 11.09 (e) none of these

Directions (11-13): Read the given information carefully and answer the following questions. The chart shows the various steps of SBI clerk exam i.e., from total application for this exam to the number of applicants who failed in language test.



And applicants who did not failed in language test, they get final selection.

(ii) All applicants who passed the pre-exam are eligible for mains exam and all attend the mains exam.

11. If applicants who get final selection is 400 and the applicants who failed in pre-exam is 3600. Then find the number of applicants who failed in language test?

- (a) 3200 (b) 3500 (c) 3600 (d) 3000 (e) 2500

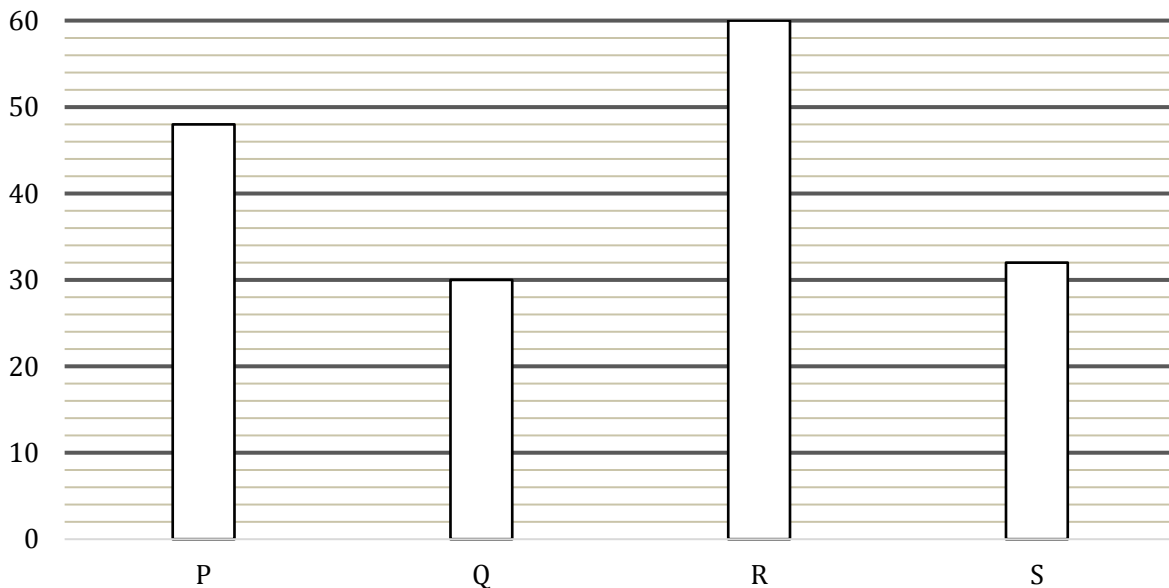
12. If total applicants who attend the pre-exam is 60% of valid applications. Total valid application is 40% of total application and average of X, Y and Z is 20,000. Find applicants who eligible for mains exam are what percent of Z ?

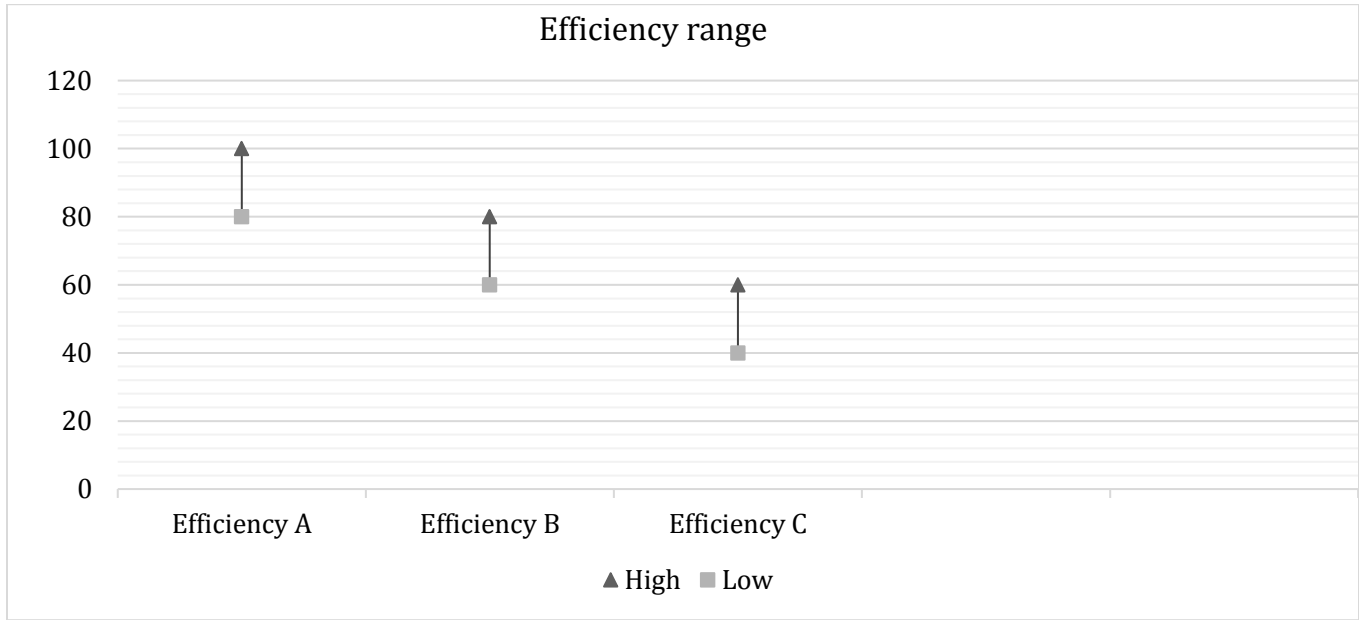
- (a) 105% (b) 110% (c) $112\frac{1}{2}\%$ (d) 116% (e) 120%

13. 8400 did not attend the pre-exam and 30% of the total application are valid applications. Find percent of the applicants eligible for mains exam but did not got selection in mains exam out of total applications?

- (a) $2\frac{1}{2}\%$ (b) 3% (c) $3\frac{1}{2}\%$ (d) 4% (e) $4\frac{1}{2}\%$

Direction (14 – 15): Bar graph given below shows number of hours taken by four pipes to fill a tank individually and stock chart shows three different range of efficiency. Read the data carefully and answer the questions below.





Note –

Level 1 – take High range of efficiency

Level 2 – take mid-range of efficiency

Level 3 – take low range of efficiency

14. Pipe P & Q opened together with level 2 & level 1 of efficiency A respectively and after 't' hours pipe S replaced both the pipes and fill remaining tank with level 3 of efficiency C in $(t - \frac{8}{3})$ hours. If pipe R fill tank for '2.5t' hours with level 3 of efficiency B, then find what portion of tank will remain unfilled?

- (a) $\frac{2}{3}rd$ (b) $\frac{2}{7}th$ (c) $\frac{3}{5}th$ (d) $\frac{2}{11}th$ (e) $\frac{2}{9}th$

15. Pipe P opened for 'x' hours with level 2 of efficiency B & remaining tank filled by pipe Q in 'y' hours with level 2 of efficiency C. If pipe R opened for 'x' hours with level 2 of efficiency A and remaining tank filled by pipe S in 'y' hours with 2.4% more efficiency than level 2 of efficiency C. Find in how many hours remaining tank filled by pipe S with his usual efficiency, if initially pipe R opened for (x + y) hours with level 2 of efficiency C?

- (a) $14\frac{2}{7}$ hours (b) 6 hours (c) 12 hours (d) $14\frac{2}{3}$ hours (e) $16\frac{2}{3}$ hours

Previous Years' Solutions of Mains

Sol. (1 – 5):

Using data given, we get

Orders continued (booked) = Orders Received – Orders Cancelled

Orders delivered = Orders Booked – Orders not Delivered

Days	Orders Received	Orders Booked	Orders Cancelled	Orders Delivered	Orders Not Delivered
Monday	600	400	200	280	120
Tuesday	400	400 – Y	Y (let)	320 – Y	80
Wednesday	500	300	200	140	160
Thursday	600	360	240	60	300
Friday	X (let)	X – 80	80	X – 280	200
Saturday	400	400 – Z	Z (let)	280 – Z	120

1. (d): required difference = $(300 + 360) - (280 + 140) = 240$

2. (b): ATQ, $400 - Y = 50 + 400 - Z$

$$Z - Y = 50 \dots\dots\dots(i)$$

$$120 - 80 = 320 - Y - 280 + Z$$

$$Y = Z \dots\dots\dots(ii)$$

Using (i) & (ii), $Y = Z = 25$

Orders cancelled on Tuesday = 25

$$\text{Required \%} = \frac{80 - 25}{80} \times 100 = 56.25\%$$

3. (a): ATQ, $600 + X + 400 = 150 + 600 + 400 + 500$

$$X = 650$$

$$X - 280 > 280 - Z$$

$$Z < 90$$

$$\text{Required difference} = Z - 60 < 30$$

Since $Z < 90$ so required difference should be less than 30 ($90 - 60$)

4. (d): ATQ, $320 - Y = \frac{2}{3} \times 360 = 240$

$Y = 80$

$X - 280 + 280 - Z = 390$

$X - Z = 390$ (i)

$X - 280 > 280 - Z$

$X > Z$

Also, $Z \leq 280$ (since $280 - Z$ orders were delivered on Saturday)

$X \geq 280$ (since $X - 280$ orders were delivered on Friday)

(a) $Y > 80$ not true

(b) $Y - Z = 322$ or $Z - Y = 322$

$Z = 402$ not true

(c) $X - 280 > 500$ not true

(d) $280 - (X - 280) = 0$

$X = 560$ true

(e) $80 > 200$ not true

5. (c): ATQ, $\frac{600+X}{280+140+280-Z} = \frac{65}{34}$

$\frac{600+X}{700-Z} = \frac{65}{34}$ (i)

$Y = \frac{90}{100} \times 200 = 180$

$Z = 200 - Y = 20$

Now putting value of Z in (i)

$\frac{600+X}{680} = \frac{65}{34}$

On solving, $X = 700$

Total orders booked = $400 + 400 - Y + 300 + 360 + X - 80 + 400 - Z$
 $= 2280$

6. (e): Cost price of ten bags = $10 \times 42 \times \frac{100}{112} = 375$ Rs.

Cost price of six bottles = $6 \times 30 \times \frac{100}{120} = 150$ Rs.

Total selling price of ten bags and six bottles = $10 \times 42 + 6 \times 30 = 600$ Rs.

Required percentage = $\frac{600-525}{525} \times 100 = 14\frac{2}{7}\%$

7. (b): Cost price for man for two wallets = 72 Rs.

Selling price for man for two wallets = $72 \times \frac{75}{100} = 54$ Rs.

Selling price for man for rest two wallets = $72 \times \frac{112.5}{100} = 81$ Rs.

Total selling price = $54 + 81 = 135$ Rs.

Net loss = $144 - 135 = \text{Rs. } 9$

8. (a): Required average = $\frac{1}{5} \left(\frac{42}{112} \times 100 + \frac{24}{120} \times 100 + \frac{36}{125} \times 100 + \frac{30}{120} \times 100 + \frac{42}{140} \times 100 \right)$
 $= \frac{1}{5} \times (37.5 + 20 + 28.8 + 25 + 30)$
 $= \frac{141.3}{5} = 28.26$ Rs.

9. (a): Cost price of a single bottle = $30 \times \frac{100}{120} = 25$ Rs.

Cost price of a single tiffin = $24 \times \frac{100}{120} = 20$ Rs.

Selling price of single tiffin = $20 \times \frac{150}{100} = 30$ Rs.

Required Average = $\frac{30+25}{2} = 27.5$ Rs.

10. (a): Let selling price of one belt for A = $3x$ Rs.

And selling price of one belt for B = $2x$ Rs.

cost price of one belt = 30 Rs.

profit made by shopkeeper on selling five bags

$= 5 \times \left[42 - 42 \times \frac{100}{112} \right] = 22.5$ Rs.

ATQ

$5 \times [(3x - 30) + (2x - 30)] = 22.5$

$\therefore x = 12.9$

So, difference of selling price of A and B

$= (3x - 2x) = 12.9$

11. (c): ATQ,

$9600 - \left(X \times \frac{30}{100} \right) = 3600$

$\Rightarrow X = 20000$

People who get selection in mains = $\frac{20}{100} \times$

$20000 = 4000$

\therefore number of applicants who failed in language test = $4000 - 400 = 3600$.

12. (e): ATQ

$X = \frac{9600}{60} \times 100 = 16000$

$Y = \frac{16000}{40} \times 100 = 40000$

And

$X + Y + Z = 20000 \times 3$

$Z = 60000 - 40000 - 16000$

$Z = 4000$

Total applicants who eligible for mains exam =

$16000 \times \frac{30}{100} = 4800$

Required percentage = $\frac{4800}{4000} \times 100 = 120\%$

13. (b): Total valid applications, $X = 9600 + 8400 = 18000$

Total applications, $Y = \frac{18000}{30} \times 100 = 60000$

Required percentage = $\frac{18000 \times \frac{10}{100}}{60000} \times 100 = 3\%$

- 14. (c):** Total capacity of tank = 480 units (LCM of hours taken by pipes P, Q, R & S)
Efficiency of pipe P = $\frac{480}{48} = 10$ units/hour
Efficiency of Q = $\frac{480}{30} = 16$ units/hour
Efficiency of R = $\frac{480}{60} = 8$ units/hour
Efficiency of S = $\frac{480}{32} = 15$ units/hour
Efficiency of pipe P with level 2 of efficiency A = $10 \times \left(\frac{80+100}{2}\right) \times \frac{1}{100} = 9$ units/hour
Efficiency of pipe Q with level 1 of efficiency A = $16 \times \frac{100}{100} = 16$ units/hour
Efficiency of Pipe S with level 3 of efficiency C = $15 \times \frac{40}{100} = 6$ units/hour
ATQ –
 $(16 + 9) \times t + 6 \left(t - \frac{8}{3}\right) = 480$
 $25t + 6t - 16 = 480$
 $31t = 496$
 $t = 16$ hours
Efficiency of pipe R with level 3 of efficiency B = $8 \times \frac{60}{100} = 4.8$ units/hour
Work done by pipe R in 2.5t hours = $2.5 \times 16 \times 4.8 = 192$ units
Required portion remained unfilled of tank = $480 - \frac{192}{480} = \frac{3}{5}$ th
- 15. (d):** Total capacity of tank = 480 units (LCM of hours taken by pipes P, Q, R & S)
Efficiency of pipe P = $\frac{480}{48} = 10$ units/hour
Efficiency of Q = $\frac{480}{30} = 16$ units/hour

Efficiency of R = $\frac{480}{60} = 8$ units/hour
Efficiency of S = $\frac{480}{32} = 15$ units/hour
Efficiency of pipe P with level 2 of efficiency B = $10 \times \frac{60+80}{2} \times \frac{1}{100} = 7$ units/hour
Efficiency of pipe Q with level 2 of efficiency C = $16 \times \frac{40+60}{2} \times \frac{1}{100} = 8$ units/hour
ATQ –
 $7x + 8y = 480$ ----- (i)
Efficiency of pipe R with level 2 of efficiency A = $8 \times \frac{80+100}{2} \times \frac{1}{100} = 7.2$ units/hour
Efficiency of pipe S with level 2 of efficiency C = $15 \times \left(\frac{40+60}{2}\right) \times \frac{1}{100} \times \frac{102.4}{100} = 7.68$ units/hours
 $7.2x + 7.68y = 480$ ----- (ii)
From (i) and (ii) we get
 $7x + 8y = 7.2x + 7.68y$
 $x : y = 8 : 5$
 $y = \frac{5x}{8}$
From (i)-
 $7x + 8 \times \frac{5x}{8} = 480$
 $x = 40$ hours
And, $y = 25$ hours
Efficiency of pipe R with level 2 of efficiency C = $8 \times \frac{40+60}{2} \times \frac{1}{100} = 4$ units/hour
Tank filled by pipe R in (x + y) hours = $(40 + 25) \times 4 = 260$ units
Remaining tank filled by S with his usual efficiency = $\frac{480-260}{15} = 14\frac{2}{3}$ hours

