Time : 2.00 Hrs.   **MM : 110**

RSAT

(REGIS SCHOLARSHIP CUM ADMISSION TEST)

for

CLASS X

(Student Moving IX to X)

NAME OF CANDIDATE : _____

REGISTRATION NUMBER : _____

TEST CENTER : _____

MOBILE NUMBER : _____

Regis Career Institute

INSTRUCTIONS :

Things NOT ALLOWED in EXAM HALL : Blank Paper, clipboard, log table, slide rule, calculator, camera, mobile and any electronic or electrical gadget. If you are carrying any of these then keep them at a place specified by invigilator at your own risk.

1. This booklet is your Question Paper. **DO NOT** break seal of Booklet until the invigilator instructs to do so.
2. The Answer Sheet is provided to you separately which is a machine readable Optical Response Sheet (ORS). You have to mark your answers in the ORS by darkening bubble, as per your answer choice, by using black & blue ball point pen.
3. Total Questions to be Attempted 65.
4. After breaking the Question Paper seal, check the following:
    a. In the booklet containing question no. 1 to 80 under V Section i.e. Section-I, Section-II, Section-III, Section-IV and Section V.
    b. Section-V contains total 20 questions of IQ (Mental Ability).
    c. Section-I to Section-IV contains total 60 questions which are - Section-I : Physics, Section-II : Chemistry, Section-III : Mathematics and Section IV : Biology.
    d. IIT-JEE Students need to attempt from Section-I to Section-III and NEET Students need to attempt Section-I, Section-II & Section-IV.
    e. Section-V (Mental Ability) is compulsory for both Stream (IIT-JEE & NEET).
5. Marking Scheme:
    a. If darkened bubble is RIGHT answer : (Section-I to Section-IV) **2 Marks** & Section-V : **1 Marks**.
    b. If no bubble is darkened in any question: **No Mark**.
    c. **Negative Marking in Section-I to Section-IV: -0.50 & No negative Marking in Section-V**.
6. If you are found involved in cheating or disturbing others then your ORS will be cancelled.
7. Do not put any stain on ORS and hand it over back properly to the invigilator.

Section–I : PHYSICS

This section contains **15 Multiple Choice Questions.** Each question has four choices (A), (B), (C) and (D) out of which ONLY ONE is correct.

1. When a ball is released from a top of building, the distance covered by it in 4 sec will be

   (A) 20m   (B) 40m   (C) 80m   (D) None

2. The ratio of the height from which two bodies are dropped is 3 : 7 respectively. The ratio of their final velocities is

   (A) 7 : 3   (B) 9 : 49   (C) $\sqrt{3} : \sqrt{7}$ (D) $\sqrt{7} : \sqrt{3}$

3. The velocity of a particle at an instant is 10 m/s. After 5s, the velocity of the particle is 20 m/s. The velocity at 3 s before the instant when the velocity of the particle was 10 m/s is

   (A) 8 m/s   (B) 6 m/s   (C) 4 m/s   (D) 5 m/s

4. A car starts from rest and moves with a uniform acceleration for 2 s, after that it starts to move with a uniform deceleration of 4 m/s^2. The acceleration of the body if it takes 3 s for the car to stop is

   (A) 4 m/s^2 (B) 6 m/s^2 (C) 12 m/s^2 (D) none of these

5. A stone when thrown with a velocity of 5 m/s attains a maximum height of H_1 and when thrown with a velocity of 10 m/s attains a maximum height of H_2. Find the correct relation between H_1 and H_2.

   (A) $H_1 = H_2$ (B) $H_1 = H_2/3$ (C) $H_1 = 2H_1$ (D) $H_1 = H_2/4$

6. An ant moves along a circular track of 6 m radius such that the arc of the circular track subtends an angle of 30o at the centre. The distance covered by the ant is

   (A) π (B) 13 π (C) 6 π (D) 4π

7. A ball is dropped from a balloon which is rising up with a speed of 2 m/s. After 2 s the velocity of the packet is

   (A) 20 m/s   (B) 18 m/s   (C) 22 m/s   (D) None of these

8. If a car travels 30m and 26m in its 7th and 6th second of its travel respectively, then the initial velocity and acceleration of the body is

   (A) 4 m/s, 4 m/s^2 (B) 6 m/s, 4 m/s^2 (C) 0 m/s, 4 m/s^2 (D) 10 m/s, 8 m/s^2

9. If a ball is thrown upward with a velocity of 6 m/s. The maximum height attained by the particle is

   (A) 1.8 m   (B) 3.6 m   (C) 5.4 m   (D) none of these

10. Out of the following the only correct statements about satellites is

    (A) A satellite can not move in a stable orbit in a plane passing through the earth's centre

    (B) Geostationary satellites are launched in equatorial plane

    (C) We can use just one geostationary satellite for global communication around the globe

    (D) The speed of a satellite increases with an increase in the radius of its orbit.

11. A parrot sitting on the floor of a wire cage which is being carried by a boy starts flying. The boy will feel that the box is now

    (A) heavier   (B) lighter

    (C) shows no change in weight   (D) lighter in beginning and heavier later

12. A force of 20 N is needed to overcome a frictional force of 5N and accelerate a 3 kg mass across a floor. What is the acceleration of the mass ?

    (A) 4m/s^2 (B) 5m/s^2 (C) 7m/s^2 (D) 20m/s^2

13. Friction

    (A) can occur only between two surfaces that are moving relative to one another

    (B) is equal to the normal force divided by the coefficient of friction

    (C) opposes the relative motion between the two surfaces in contact

    (D) only depends on one of the surfaces in contact

14. When a stone of mass m is falling on the earth of mass M, the acceleration of earth will be

(A) zero   (B) $\dfrac{mg}{M}$ (C) $\dfrac{Mg}{m}$ (D) g

15. Which of the following statements is False? No net force act on :

(A) A rain drop falling vertically with a constant speed

(B) A car moving with uniform velocity on a rough road

(C) A car moving with uniform velocity on a circular track

(D) A cork floating on water surface

Section–II : CHEMISTRY

This section contains **15 Multiple Choice Questions.** Each question has four choices (A), (B), (C) and (D) out of which ONLY ONE is correct.

16. The number of neutrons in dipositive zinc ion (Zn^{2+} with mass number 70) is

(A) 34   (B) 36   (C) 38   (D) 40

17. Neutron was discovered by:

(A) J.J. Thomson   (B) Chadwick   (C) Rutherford   (D) Priestley

18. What mass of carbon monoxide has the same number of oxygen atom as are present in 22 g CO_2 ?

(A) 14 g   (B) 32 g   (C) 28 g   (D) 56 g

19. 0.56 g of gas occupies 280 cm^3 at NTP, then its molecular mass is

(A) 4.8   (B) 44.8   (C) 2   (D) 22.4

20. How many H-atoms are present in 0.046 g of Ethanol ?

(A) 6×10^{20} (B) 1.2×10^{21} (C) 3×10^{21} (D) 3.6×10^{21}

21. Which one of the following does not undergo sublimation?

(A) Camphor   (B) Dry ice   (C) Silica   (D) Iodine

22. Which of the following will show Tyndall effect?

(A) Salt solution   (B) Copper sulphate solution

(C) Starch solution   (D) Sugar solution

23. The best way to recover sugar from an aqueous sugar solution is

(A) Evaporation to dryness   (B) Distillation

(C) Filtration   (D) Crystallisation

24. Which of the following is homogenous mixture?

(A) Air   (B) Muddy water

(C) Milk   (D) Starch solution

25. Which has maximum number of atoms ?

(A) 24 g of C(12)   (B) 56 g of Fe (56)

(C) 27 g of Al (27)   (D) 108 g of Ag (108)

26. A sample of $CaCO_3$ contains 3.01×10^{23} ions of both Ca^{2+} and CO_2^- .The mass of the sample is:

(A) 100 g   (B) 50 g   (C) 200 g   (D) 5 g

27. What mass of $NH_3(g)$ will be formed when 50 kg of $N_2(g)$ and 10 kg of $H_2(g)$ are mixed ?

(A) 50.23 kg   (B) 56.66 kg   (C) 60.7 kg   (D) 85 kg

28. The total number of valence electrons in 4.2 g of nitride ion (N^{3-}) are

(A) $2.4\,N_A$ (B) $4.2\,N_A$ (C) $3.2\,N_A$ (D) $1.6\,N_A$

29. The ratio of (e/m) for a cathode ray:

(A) Varies with nature of gas in a discharge tube   (B) Is fixed

(C) Varies with different electrode   (D) Is maximum if hydrogen is taken

30. Which is the correct statement about proton?

(A) It is a nucleus of deuterium

(B) It is an ionised hydrogen molecule

(C) It is an ionised hydrogen atom

(D) It is an α - particles

Section–III : MATHEMATICS

This section contains **15 Multiple Choice Questions.** Each question has four choices (A), (B), (C) and (D) out of which ONLY ONE is correct.

31. Which of the following is incorrect?

(A) Euclid fifth postulate imply the existence of parallel lines.

(B) Two points are always collinear.

(C) Two lines perpendicular to the same line are parallel to each other.

(D) None of these.

32. In the given figure AB = AC and $\angle$ACD = 110°, then the value of $\angle$A is
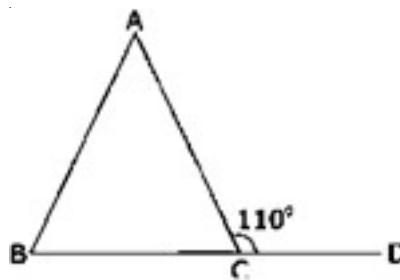
(A) 20°   (B) 30°   (C) 40°   (D) 50°

33. Choose the rational number which does not lie between rational numbers $-\dfrac{2}{5}$ and $-\dfrac{1}{5}$

(A) $-\dfrac{1}{4}$ (B) $-\dfrac{3}{10}$ (C) $\dfrac{3}{10}$ (D) $-\dfrac{7}{20}$

34. x and x + y are the square of two consecutive natural number. What is the square of the next natural number ?

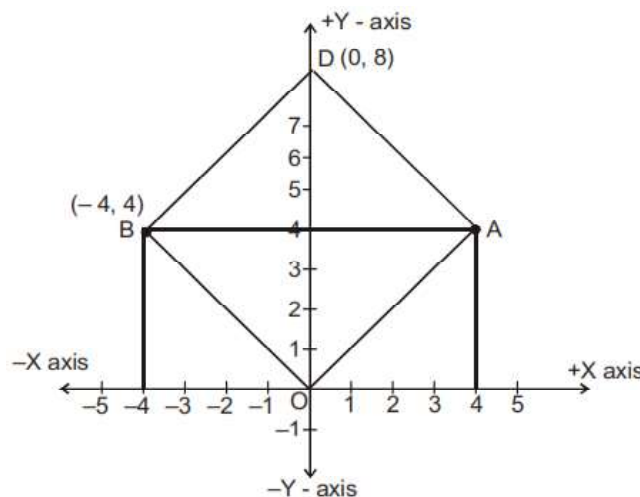(A) x + 2y   (B) x + 2y + 2   (C) x + 3y   (D) x + y²

35. If $\dfrac{3x+6}{8} - \dfrac{11x-8}{24} + \dfrac{x}{3} = \dfrac{3x}{4} - \dfrac{x+7}{24}$, then the value of x is

(A) x = 3   (B) x = 2   (C) x = 1   (D) x = 4

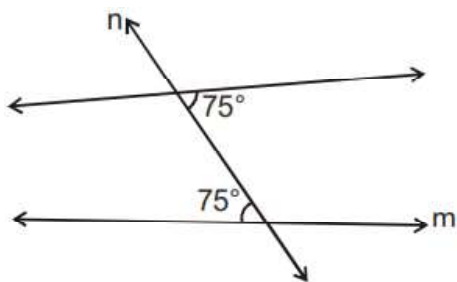**36.** If $8^{x-1} = 2^{x+3}$, value of x will be

(A) 2   (B) 4   (C) 1   (D) 3

37. If AOBD is a square then find the coordinates of point A.
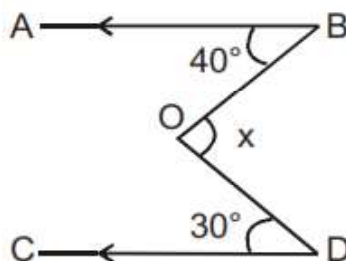

(A) $(4, 4\sqrt{2})$ (B) (4, 4)   (C) $(4\sqrt{2}, 4)$ (D) None of these

38. Given two lines *l* and *m*, these lines :

(A) Will intersect on left side of line n

(B) Will intersect on right side of line n

(C) are parallel

(D) None of these

39. In the given figure, AB || CD, ∠ABO = 40° and ∠CDO = 30°. If ∠DOB = x°, then the value of x is
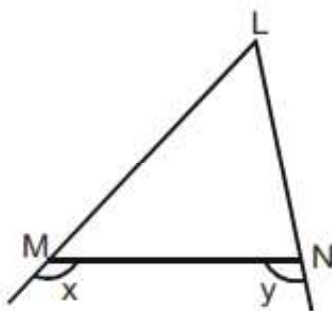

(A) 35   (B) 110   (C) 70   (D) 140

40. A man born in the first half of the 19th century was x years old in the year x^2. He was born in:

(A) 1849   (B) 1806   (C) 1812   (D) 1825

41. In the given figure, x > y. Hence

(A) LM = LN

(B) LM < LN

(C) LM > LN

(D) None of these

42. If 'm' and 'n' are natural numbers such that $\sqrt{7+\sqrt{48}} = \sqrt{m} + \sqrt{n}$ then $m^2 + n^2$ equals :

(A) 25   (B) 37   (C) 29   (D) 41

43. If N = $\dfrac{\sqrt{\sqrt{5}+2}+\sqrt{\sqrt{5}-2}}{\sqrt{\sqrt{5}+2}} - \sqrt{3-2\sqrt{2}}$ then the value of N is :

(A) $2\sqrt{2} - 1$ (B) 2   (C) 1   (D) $\sqrt{5} - \sqrt{2}$

44. Which is the greatest number amongst $2^{1/2}$, $3^{1/3}$, $8^{1/8}$ and $9^{1/9}$?

(A) $9^{1/9}$ (B) $8^{1/8}$ (C) $3^{1/3}$ (D) $2^{1/2}$

45. What is the remainder when the polynomial $p(x) = x^{200} - 2x^{199} + x^{50} - 2x^{49} + x^2 + x + 1$ is divided by (x – 1) (x – 2)?

(A) 1   (B) 7   (C) 2x + 1   (D) 6x – 5

Section–IV : BIOLOGY

This section contains **15 Multiple Choice Questions.** Each question has four choices (A), (B), (C) and (D) out of which ONLY ONE is correct.

46. Identify the following organism and state to which phylum it belongs ?

   (A) Coelenterata   (B) Porifera   (C) Platyhelminthes   (D) Annelida

47. Which of the following is causative agent of peptic ulcer ?

   (A) Helicobacter pylori   (B) Leishmania   (C) Trypanosoma   (D) Roundworm

48. Which of the following muscle is responsible for movement of food in alimentary canal ?

   (A) Smooth Muscle   (B) Striated Muscle   (C) Voluntary Muscle   (D) Cardiac Muscle

49. Which of these is not related to endoplasmic reticulum ?

   (A) It helps in the exchange of materials between nucleus and cytoplasm.

   (B) It transports material between various regions in cytoplasm.

   (C) It is the site of energy generation.

   (D) It is the site for some biochemical activities of the cell.

50. Woody female cones, like the one shown below, and male cones grow on the same tree. In which division of seeded plants would they be found?

   (A) Cycas   (B) Pinus   (C) Fern   (D) Ginkgo

51. The process of cross breeding between two different varieties of crop plants each having a desired characteristic is known as

   (A) Selection   (B) Hybridisation

   (C) Emasculation   (D) Introduction

52. What can a grower do to produce plants that are attractive and full of side branches?

   (A) Pinch off the apical meristem to decrease the amount of auxin.

   (B) Pinch off the apical meristem to increase the amount of auxin.

   (C) Pinch off the intercalary meristems to increase the amount of auxin.

   (D) Pinch off the intercalary meristems to decrease the amount of auxin.

53. Crossing over that results in genetic recombination in higher organisms occurs between

(A) Non sister chromatids of a bivalent

(B) Two daughter nuclei

(C) Two different bivalent

(D) Sister chromatids of a bivalent

54. Peripatus is a connecting link between

(A) Coelenterata and Porifera

(B) Ctenophora and Platyhelminthes

(C) Mollusca and Echinodermata

(D) Annelida and Arthropoda

55. What type of tissue is located at the area labelled D in the diagram below ?

(A) Compact bone

(B) Spongy bone

(C) Bone marrow

(D) Cartilage

Comprehension for (Q.No. 56 to Q.No.58)

AIDS stands for Acquired Immuno Deficiency Syndrome. The diseases was first identified in 1981 in USA after that it was quickly detected in Europe and other parts of the world. It is an infectious disease caused by a retrovirus which brings some defect or interferes in the natural immunity system, present in human beings. As a result, the patients become susceptible and vulnerable to serious illness and infections which would not have caused any harm to any one having their body immune system working normally.

56. AIDS spreads due to

(A) Deficiency of Vit. B

(B) Deficiency of Iron

(C) Contaminated syringe

(D) None of these

57. Which organ system gets attacked by the AIDS virus?

(A) Digestive system

(B) Immune System

(C) Respiratory system

(D) excretory system

58. AIDS is categorised as a

(A) Epidemic disease

(B) Endemic disease

(C) Pandemic disease

(D) Sporadic disease

Comprehension for (Q.No.59 & Q.No.60)

Pollution may be defined as an undesirable change in physical, chemical or biological characteris- tics of air, water and land, resulting in air pollution, water pollution and soil pollution. There are five types of primary air pollutants: particulate matter, CO, hydrocarbon, nitrogen oxide and sulphur dioxide. Secondary air pollutants are formed during chemical reactions between primary air pollut- ants and other atmospheric constituents like water vapour, sunlight etc. Stratospheric ozone plays a vital role in protecting living organisms from the harmful effects of UV radiations. Man made CFC's are the major cause of ozone depletion.

59. Which one is not a pollutant normally?

(A) Hydrocarbons

(B) Carbon dioxide

(C) Carbon monoxide

(D) Sulphur dioxide

60. Ultraviolet radiations from sunlight cause a reaction which produces

(A) O_3

(B) SO_2

(C) CO

(D) CH_4

Section–V : MENTAL ABILITY

This section contains **20 Multiple Choice Questions.** Each question has four choices (A), (B), (C) and (D) out of which ONLY ONE is correct.

61. Each question consists of five statements followed by options consisting of three statements put together in a specific order. Choose the option which indicates a valid argument, that is where the third statement is a conclusion drawn from the preceding two statements.

    A. Apples are not sweets.

    B. Some apples are sweets.

    C. All sweets are tasty.

    D. Some apples are not tasty.

    E. No apple is tasty.

    (A) CEA   (B) BDC   (C) CBD   (D) EAC

62. How many triangles are there in the following figure ?
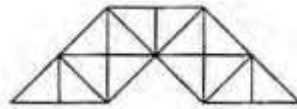
    (A) 25   (B) 20   (C) 31   (D) 29

    Directions (Q.63 & Q.64) : In a school, there were five teachers. A and B were teaching Hindi and English. C and B were teaching English and Geography. D and A were teaching Mathematics and Hindi. E and B were teaching History and French.

63. Who among the teachers was teaching maximum number of subjects ?

    (A) A   (B) B   (C) C   (D) D

64. D, B and A were teaching which of the following subjects ?

    (A) English only   (B) Hindi and English

    (C) English and Geography   (D) Hindi only

65. How many 7s immediately preceded by 6 but not immediately followed by 4 are there in the following series?

    7 4 2 7 6 4 3 6 7 5 3 5 7 8 4 3 7 6 7 2 4 0 6 7 4 3

    (A) One   (B) Two

    (C) Four   (D) Six

66. Find the next term in the series : 10, 19, 40, 77, 158, ?

    (A) 311   (B) 307
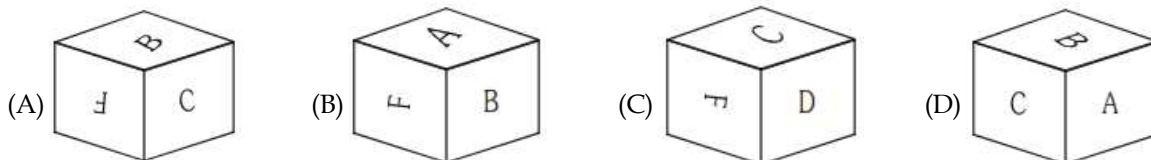
    (C) 301   (D) 299

67. When the time by the watch is 20 minutes past 7, the angle between the hands of the watch is

    (A) 100°   (B) 90°   (C) 80°   (D) 95°

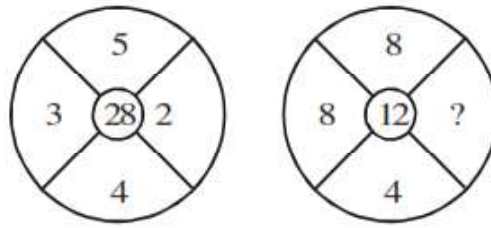68. If 12th March 1986 was Wednesday, then 31st March 1994 would be

    (A) Wednesday   (B) Thursday

    (C) Friday   (D) Saturday

69. Of the following figures, which figure does not belong to the cube ?

70. Find the missing term in the following Figure

(A) 3   (B) 9   (C) 1   (D) 2

Direction (Q.71 & Q.72) : Read the following information carefully and answer the questions given below it

(i) P, Q, R, S, T and U are six members in a family in which there are two married couples.

(ii) T, a teacher is married to the doctor who is mother of R and U.

(iii) Q, the laywer is married to P.

(iv) P has one son and one grandson.

(v) Of the two married ladies one is a housewife.

(vi) There is also one student and male engineer in the family.

71. How is P related to R ?

(A) Grandfather   (B) Mother

(C) Sister   (D) Grandmother

72. How is R related to U ?

(A) Brother   (B) Sister

(C) Brother or Sister   (D) Data inadequate

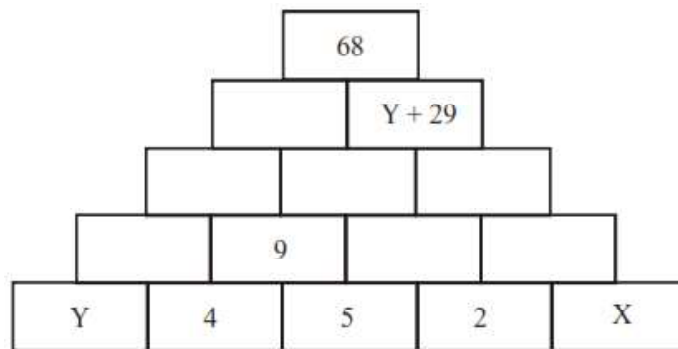**73.** P≠Q implies that Q is standing 2 km to the right of P

P*Q implies that Q is standing 2 km to the left of P

P@Q implies that Q is standing 2 km below P

If F≠S @ B*V, in which direction is F with respect to V?

(A) North   (B) South

(C) East   (D) West

74. In the figure, number in any cell is obtained by adding two numbers in the cells directly below it. The value of X-Y is
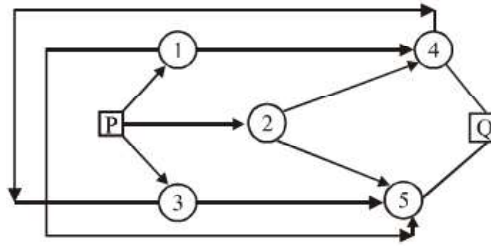

(A) 2   (B) 3   (C) 4   (D) 5

75. In a game "Pass the ball" position of some players are as follows

'A' is 20 meters to the north of 'B' who is 18 meters to the east of 'C'. If the ball was initially with B and is passed to C, in which direction A is to C ?

(A) North-East   (B) North-West

(C) South-East   (D) None of these

76. What is the number of routes from P to Q?

(A) 5   (B) 6   (C) 9   (D) 1

77. In the following question below three statements (I, II, III) are given followed by four conclusions. You have to take the given statements to be true even if they seem to be at variance with commonly known facts. Read all the conclusions and then decide which of the given conclusions logically follows from the given statements, disregarding commonly known facts. Choose the correct options.

Statements : (I) Some drivers are technicians.

(II) All technicians are engineers.

(III) Some engineers are lecturers.

Conclusions : (A) Some technicians are lecturers.

(B) Some lecturers are drivers.

(C) All engineers are technicians.

(D) Some engineers are drivers.

(A) Only C follows   (B) Only D follows   (C) Only C and D follows   (D) None of these

78. Symbols are to be coded as follows in a language :

Symbol :	@	$	#	*	%	£	+	X	=	?
Code :	F	R	H	S	E	A	D	N	O	K

Following conditions are observed here :

(i) If the middle symbol is £ then it is to be coded as L

(ii) If the first symbol is + and the last symbol is # both are to be coded as 6

(iii) If the first symbol is % and the last symbol is $ then both are to be coded as 4

(iv) If the first and last symbol are @ then both are to be coded as 2

Applying these conditions, find out the correct code for the symbols in the question given below.

% @ = £ + *$

(A) 4 F O L D S 4   (B) E F O L D S R   (C) 4 F O A D S 4   (D) E F O L D S 6

79. 343 cubes of similar size are arranged in the form of a bigger cube (7 cubes on each side, i.e. 7 × 7 × 7) and kept at the corner of a room, all the exposed surfaces are painted then How many of the cubes have at least 2 faces painted ?

(A) 19   (B) 144   (C) 120   (D) None of these

80. In the following question, choose the alternative figure in which the question figure (X) is embedded.

(X)

(A)   (B)   (C)   (D)