KENDRIYA VIDYALAYA SANGATHAN JAMMU REGION
PREBOARD- 1   (2025-26)   SET-1

Class – X	**Maximum Marks: 80**
Subject- Basic Maths (241)	**Time Allowed: 3 Hours**

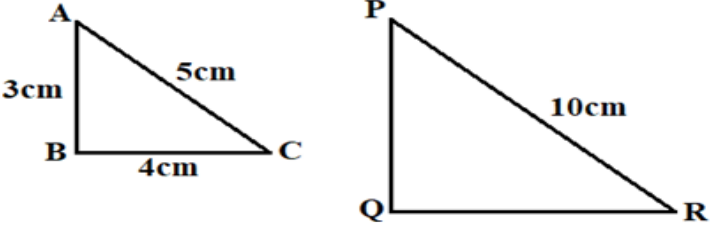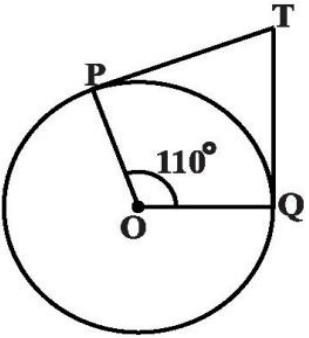**GeneralInstructions:**

Readthefollowinginstructionscarefullyandfollowthem:

1. Thisquestionpaper contains 38questions. AllQuestions arecompulsory.

2. ThisQuestionPaperisdividedinto5SectionsA,B,C,DandE.

3. InSectionA,Questionnumbers1-18aremultiplechoicequestions(MCQs)andquestionno.19and 20areAssertion-Reasonbasedquestionsof1markeach.

4. InSectionB,Questionnumbers21-25areveryshortanswer(VSA)typequestions,carrying02marks each.

5. In SectionC,Questionnumbers 26-31are shortanswer(SA)typequestions,carrying 03markseach.

6. InSection D,Question numbers32-35arelong answer(LA) type questions,carrying05markseach.

7. InSectionE,Questionnumbers36-38arecasestudy-basedquestionscarrying4markseachwith subpartsofthevaluesof1,1and2markseachrespectively.

8. Thereisnooverallchoice.However,aninternalchoicein2questionsofSectionB,2questionsof SectionCand2questionsofSectionDhasbeenprovided.Aninternalchoicehasbeen provided inallthe2marksquestionsofSectionE.

9. Drawneatandcleanfigureswhereverrequired.Takeπ=22/7whereverrequiredifnotstated.
10. Useofcalculatorsisnotallowed.

S No	**SECTION – A (1 MARKS EACH)**	Marks
	CHOOSE THE CORRECT OPTION :	
1.	Whichofthefollowingisnotarationalnumber? (a)$\sqrt{6}$ (b)$\sqrt{9}$ (c)$\sqrt{25}$ (d)$\sqrt{36}$	1
2.	The number of polynomials having– 2and5 as itszeroesis (a) one(b) two(c) three (d) Infinitelymany	1
3.	The pair of equations x + 2y + 5 = 0 and −3x − 6y + 1 = 0 have (a) infinite number of solutions (b) unique solution (c) no solution (d) one solution	1
4.	Which of the following is a solution of the quadratic equation $2x^2$ +x–6=0?	1

	(a)x=-2　　　　(b)x=−12　　　　(c)$x = -\frac{3}{2}$(d)x=−3	
5.	The value of x for which $2x,(x+10)$and$(3x+2)$ are the three consecutive terms of an AP is a) 6　　　　　　　　b)−6　　c)−2d)2	1
6.	Given first term of A.P is 5 and common difference is 2. Find 10th term of the A.P. a) 22　　　　　　b) 23　　　　　　　c) 24　　　　　　　　d) 26	1
7	If ΔABC~ΔPQR, then perimeter of the triangle PQR (in cm) is a)12 b)24 c)18 d)20	1
8	ThepointP(1, 2) dividesthejoinofA(−2, 1) and B(7,4) areintheratioof (a)3:2　　　(b)2:3　　　(c)2:1　(d)1:2	1
9	The distance between the points A(2, −3) and B(2, 2) is (a) 2 units　　　　(b) 4 units　　　　　(c) 5 units　　　(d) 3 units	1
10	(secA+tanA)(1− sinA)= (a) sec A　　(b) sinA(c)cosecA　(d)cosA	1
11	In the figure, if TP and TQ are the two tangents to a circle with centre O so that ∠POQ = 110°, then ∠PTQ is equal to? (a) 60^0　　　(b) 70^0(c) 80^0　　(d) 90^0	1
12	The length of a tangent from a point A at a distance 5 cm from the centre of the circle is 4 cm. The radius of the circle is: (a) 3 cm　　　(b) 5 cm　　　　　(c) 7 cm　　　　　(d) 10 cm	1
13	IfP(E) = 0.07, then what is the probability of 'not E'? (a) 0.93　　　　b) 0.95　　　　　　(c) 0.89　　　　　　　(d) 0.90	1
14	The curved surface area of a sphere of radius 7 cm is: (a) 516 cm²(b) 616 cm²(c) 716 cm² (d) 880 cm²	1
15	Two concentric circles are of radii 5 cm and 3 cm. The length of the chord of the	1

	larger circle which touches the smaller circle is: (a) 8 cm (b) 10 cm (c) 12 cm (d) 18 cm		
16	The mean of the following frequency distribution is 	C.I	0–10	10–20	20-30	30–40	40-50	 	F	12	16	6	7	9	 (a)12 (b)16 (c)22 (d)20	1
17	If the mode of 12, 16, 19, 16, x, 12, 16, 19, 12 is 16, then the value of x is (a)12 (b)16 (c)19 (d)18	1
18	A bag has 4 red balls and 2 yellow balls. A ball is drawn from the bag without looking into the bag. What is probability of getting a yellow ball? (a)$\frac{1}{6}$ (b)$\frac{2}{3}$ (c)$\frac{1}{3}$ (d)1	1
	Direction for questions 19 & 20: In question numbers 19 and 20, a statement of Assertion (A) is followed by a statement of Reason (R). Choose the correct option.	
19	**Assertion:** If $x = 2 \sin^2 \theta$ and $y = 2 \cos^2\theta + 1$ then the value of $x + y = 3$. **Reason :** For any value of θ, $\sin^2 \theta + \cos^2 \theta = 1$ (a) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A). (b) Both Assertion (A) and Reason (R) are true but Reason (R) is not the correct explanation of Assertion (A). (c) Assertion (A) is true but Reason (R) is false. (d) Assertion (A) is false but Reason (R) is true.	1
20	**Assertion :** D and E are points on the sides AB and AC respectively of a ΔABC such that DE‖BC then the value of x is 11, when AD = 4cm, DB = (x – 4) cm, AE = 8cm and EC = (3x – 19) cm. **Reason :** If a line divides any two sides of a triangle in the same ratio then it is parallel to the third side. (a) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A). (b) Both Assertion (A) and Reason (R) are true but Reason (R) is not the correct explanation of Assertion (A). (c) Assertion (A) is true but Reason (R) is false. (d) Assertion (A) is false but Reason (R) is true.	1
	Section-B	
21	Show that the number 2× 5 ×7 × 11 + 11 × 13 is a composite number.	2

	OR Find thesmallestnumberwhichisdivisiblebyboth306and657.		
22	If −2 is a zero of the polynomial $3x^2 + 4x + 2k$ then find the value of k.	2
23	Findthenatureofroots ofthequadraticequation $x^2 + 4x - 3\sqrt{2} = 0$.	2
24	Prove that "The lengths of tangents drawn from an external point to a circle are equal."	2
25	Ifcosθ=0.6,showthat(5sinθ-3tanθ)=0 **OR** IfA=45^0, verifythat sin2A=2sinAcosA	2
	Section-C (3 marks each)	
26	There is a circular path around a sports field. Sonia takes 18 minutes to drive one round of the field, while Ravi takes 12 minutes for the same. Suppose they both start at the same point and at the same time, and go in the same direction. After how many minutes will they meet again at the starting point?	3
27	Drawthegraphsoftheequations: 4x − y − 8=0; 2x - 3y + 6 = 0 Alsodeterminetheverticesofthe triangle formedbythe linesandx - axis. **OR** The taxi charges in a city consist of a fixed charge together with the charge for the distance covered. For a distance of 10 km, the charge paid is Rs 105 and for a journey of 15 km, the charge paid is Rs 155. What are the fixed charges and the charge per km? How much does a person have to pay for travelling a distance of 25 km?	3
28	Find the sum of first 50 odd natural numbers	3
29	Prove that $sec^4 A(1 - sin^4 A) - 2\,tan^2 A = 1$	3

30	If the mean of the following distribution is 54, find the value of *p*.						3

C.I	0-20	20-40	40-60	60-80	80-100
Frequency	7	p	10	9	13

OR

Calculate mode of the following data:

Marks	0-20	20-40	40-60	60-80	80-100
No. of students	5	10	12	6	3

31	Show that parallelogram circumscribing a circle is a rhombus.	3

Section-D (5 marks each)

32	A train travels 360 km at a uniform speed. If the speed had been 5 km/h more, it would have taken 1 hour less for the same journey. Find the speed of the train.	5

OR

The difference of the squares of two numbers is 180. The square of the smaller number is 8 times the larger number. Find the two numbers.

33	State and prove Basic Proportionality theorem.	5
34	A solid consisting of a right circular cone of height 120 cm and radius 60 cm standing on a hemisphere of radius 60 cm is placed upright in a right circular cylinder full of water such that it touches the bottom. Find the volume of water left in the cylinder, if the radius of the cylinder is 60 cm and its height is 180 cm.	5
35	The angle of elevation of the top of a building from the foot of the tower is 30^0 and the angle of elevation of the top of the tower from the foot of the building is 60^0. If the tower is 50 m high, find the height of the building.	5

OR

From the top of a 7 m high building, the angle of elevation of the top of a cable tower is 60° and the angle of depression of its foot is 45°. Determine the height of the tower.

Section- E (CASE STUDY QUESTIONS)

36	A, B, C, D and E are five friends. They prepared some numbered cards with labelled from 11 to 60 and then they put all the number cards in the empty box. In this game, every friend was asked to pick the card randomly and after each draw, card was replaced back in the box.	

(a) Find the probability that the number on the drawn card is an odd number. (1M)

(b) Find the probability that the number on the drawn card is divisible by 5. (1M)

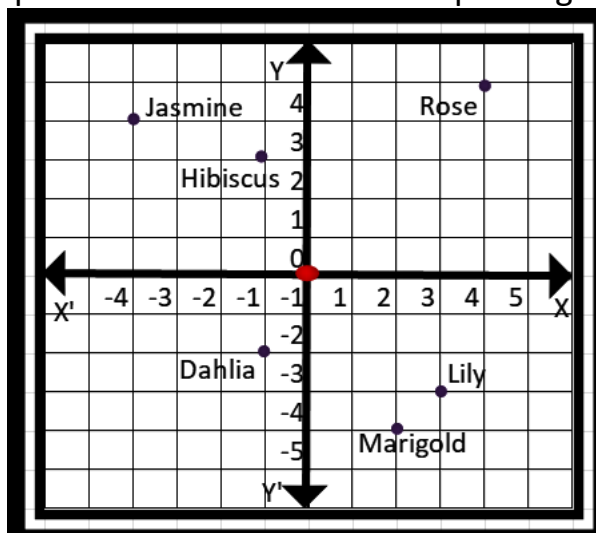c) Find the probability that the number on the drawn card is a perfect square number. (2M)

OR

Find the probability that the number on the drawn card is a prime number less than 20.

| 37 | Cartesian coordinate system is considered inside the area of a garden to understand the heights, distances and various other mathematical measurement arameters. The above positions marked are for the plants grown in the garden. | |

Answer the following questions using the above information.

a) Find co-ordinates of Lily.

b) Are points of Rose, Lily and Marigold collinear?
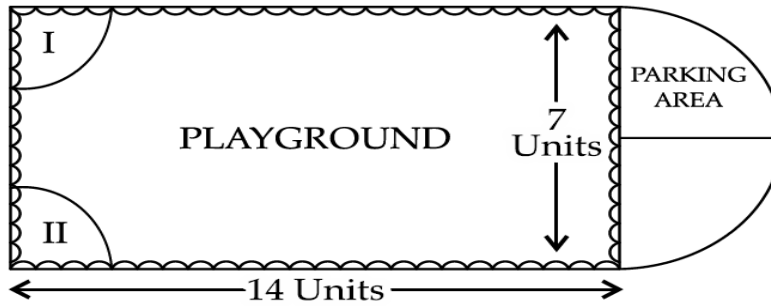
c) What is the distance between Rose and Jasmine? (1M)

OR (1M)

Find co-ordinates of point which which divides line segment between points of Hibiscus and Dahlia in 1:1. (2M)

| 38 | Governing council of a local public development authority of Dehradun decided to build anadventurous playground on the top of a hill, which will have adequate space for parking.

After survey, it was decided to build rectangular playground, with a semi-circular are allotted for Parking at one end of the playground. The length and breadth of the rectangular playground are14 units and 7 units, respectively. There are two quadrants of radius 2 units on one side forspecial seats. | |

Based on the above information, answer the following questions:

(a) What is the total perimeter of the parking area?	1M
b) What is the total area of parking and the two quadrants?	1M
OR	
What is the ratio of area of playground to the area of parking area?	2M
c) Find the cost of fencing the playground and parking area at the rate of Rs.2 per unit.	