KENDRIYA VIDYALAYA SANGATHAN, GURUGRAM REGION

PRE-BOARD EXAMINATION 2025-26

Class: 10th **Max. Marks: 80**

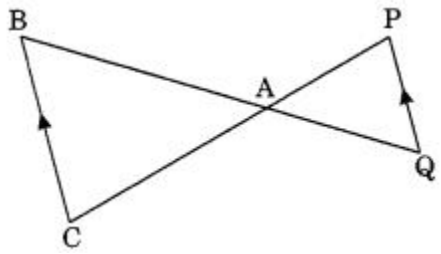
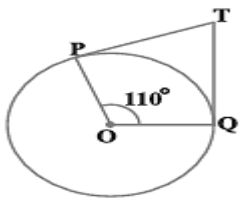
Subject: Mathematics (Basic)-241 **Time: 3 hrs**

General Instructions

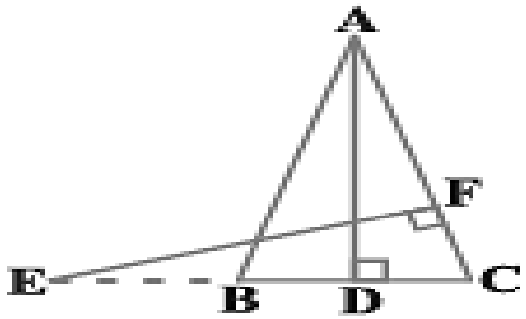
Read the following instructions carefully and follow them:

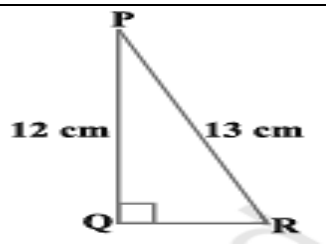
1. This question paper contains 38 questions. All Questions are compulsory.
2. This Question Paper is divided into 5 Sections A, B, C, D and E.
3. In Section A, Question numbers 1-18 are multiple choice questions (MCQs) and question no.19 and 20 are Assertion- Reason based questions of 1 mark each.
4. In Section B, Question numbers 21-25 are very short answer (VSA) type questions, carrying 02 marks each.
5. In Section C, Question numbers 26-31 are short answer (SA) type questions, carrying 03 marks each.
6. In Section D, Question numbers 32-35 are long answer (LA) type questions, carrying 05 marks each.
7. In Section E, Question numbers 36-38 are case study-based questions carrying 4 marks each with sub parts of the values of 1, 1 and 2 marks each respectively.
8. There is no overall choice. However, an internal choice in 2 questions of Section B, 2 questions of Section C and 2 questions of Section D has been provided. An internal choice has been provided in all the 2 marks questions of Section E.
9. Draw neat and clean figures wherever required. Take π = wherever required if not stated.
10. Use of calculators is not allowed.

SECTION – A (Multiple Choice Questions,1 mark each)		
Q. No.	**Question**	**Marks**
Q 1	If HCF (a, b) = 12 and a × b = 1800 then LCM (a, b) is: (a) 3600 (b) 900 (c) 150 (d) 90	1
Q 2	What is the sum of the zeroes of the quadratic polynomial $5x^2 – 2x – 7$? (a) $\frac{7}{5}$ (b) $\frac{2}{5}$ (c) $\frac{2}{7}$ (d) $-\frac{2}{5}$	1
Q 3	The pair of equations 4x – 3y = 7 and 8x + 10y = 9 have (a) a unique solution (b) infinitely many solutions (c) no solution (d) two solutions	1

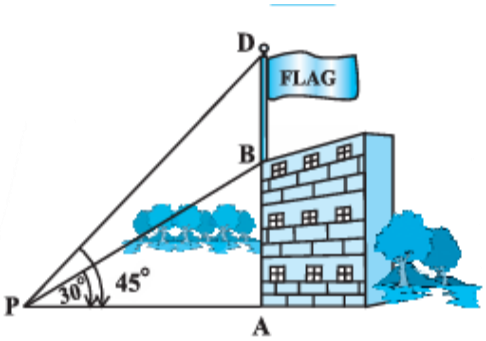
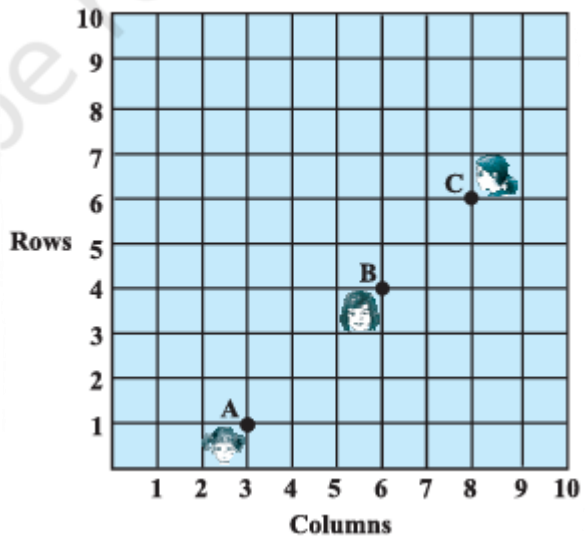
Q 4	The exponent of 5 in the prime factorization of 1250 is: (a) 1 (b) 4 (c) 3 (d) 2	1
Q5	The quadratic equation $x^2 + 5x - 6=0$ has (a) two equal roots (b) three equal roots (c) two real and distinct roots (d) no real roots	1
Q 6	The co-ordinates of the point which is mirror image of the point (−3, 5) about x-axis are : (a) (3,5) (b) (3,-5) (c) (-3,5) (d) (-3,-5)	1
Q 7	In the given figure, ΔACB ~ ΔAPQ. If AB = 6 cm, BC = 8 cm, and PQ = 4 cm then AQ is equal to  (a) 2 cm (b) 2.5 cm (c) 3 cm (d) 3.5 cm	1
Q8	The distance between the points (a, b) and (– a, – b) is (a) $2\sqrt{a^2+b^2}$ (b) $4\sqrt{a^2+b^2}$ (c) $\sqrt{a^2+b^2}$ (d)$\sqrt{a^2-b^2}$	1
Q9	The value of $1 - \tan^2 45^0$ is equal to the value of: (a) $\tan 45^0$ (b) $\cos 45^0$ (c) $\sin 90^0$ (d) $\sin 0^0$	1
Q10	$9\sec^2 A - 9\tan^2 A =$ (a) 1 (b) 9 (c) 8 (d) -9	1
Q11	In given fig., if TP and TQ are the two tangents to a circle with centre O so that $\angle POQ = 110°$, then $\angle PTQ$ is equal to: (a) 60° (b) 80° (c) 70° (d) 90° 	1
Q12	A tangent PQ at a point P of a circle of radius 5 cm meets a line through the centre O at a point Q so that OQ = 12 cm. Length PQ is: (a) 12 cm (b) 13 cm (c) 8.5 cm (d)$\sqrt{119}$ cm	1
Q13	The length of the minute hand of a clock is 12 cm. The area swept by the minute hand in 5 minutes is: ($\pi = 3.14$) (a) 37.68 cm² (b) 12.60 cm² (c) 103.98 cm² (d) 405.25 cm²	1

<table>
<tr><td>Q14</td><td>In a circle of radius 7cm, an arc subtends an angle of 60° at the centre, the length of the arc is:
(a) $\frac{22}{3}$ cm (b) $\frac{11}{3}$ cm (c) $\frac{17}{3}$ cm (d) $\frac{22}{7}$ cm</td><td>1</td></tr>
<tr><td>Q15</td><td>A cylinder and a cone are of same base radius and of same height. The ratio of the volume of the cylinder to that of the cone is
(a) 2 : 1 (b) 3 : 1 (c) 2 : 3 (d) 3 : 2</td><td>1</td></tr>
<tr><td>Q16</td><td>Consider the following frequency distribution
<table>
<tr><td>Class</td><td>10-15</td><td>15-20</td><td>20-25</td><td>25-30</td><td>30-35</td><td>35-40</td><td>40-45</td></tr>
<tr><td>Frequency</td><td>2</td><td>5</td><td>6</td><td>11</td><td>4</td><td>3</td><td>2</td></tr>
</table>
The upper limit of modal class is:
(a)20 (b) 40 (c)45 (d) 25</td><td>1</td></tr>
<tr><td>Q17</td><td>If P(E) = 0.07, then what is the probability of ‘not E’?
(a) 0.89 (b) 0.95 (c) 0.93 (d) 0.90</td><td>1</td></tr>
<tr><td>Q18</td><td>In a single throw of a die, the probability of getting a multiple of 3 is:
(a) $\frac{1}{3}$ (b) 1 (c) $\frac{1}{6}$ (d)$\frac{2}{3}$</td><td>1</td></tr>
<tr><td></td><td>DIRECTION: In the question number 19 and 20, a statement of Assertion (A) is followed by a statement of Reason (R) and has four choices. Choose the correct option.</td><td></td></tr>
<tr><td>Q19</td><td>Assertion(A): (5-√3).√7 is an irrational number.
Reason(R): Product of two irrational numbers is always irrational.
(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.</td><td>1</td></tr>
<tr><td>Q20</td><td>Assertion (A): The value of tanθ increases as θ increases from 0^0 to 90^0 .
Reason (R): As the angle increases, the ratio of opposite side to adjacent side in a right triangle increases.
(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.</td><td>1</td></tr>
</table>

	Section B	
	Section B consists of 5 questions of 2 marks each.	
Q21	If 17^{th} term of an A.P. exceeds its 10^{th} term by 7. Find the common difference.	2
	OR	
Q21	Find the sum of first 24 terms an AP whose nth term is given by: $a_n=2+3n$	2
Q22	In given fig, E is a point on side CB produced of an isosceles triangle ABC with AB = AC. If AD ⊥ BC and EF ⊥ AC, prove that Δ ABD ~ Δ ECF. 	2
Q23	Evaluate: $\cos^2 30° + 2\tan^2 45° - \sin^2 60°$.	2
Q24	Two concentric circles are of radii 5 cm and 3 cm. Find the length of the chord of the larger circle which touches the smaller circle.	2
Q25	Find the area of a quadrant of a circle whose circumference is 22 cm.	2
	OR	
Q25	A chord of a circle of radius 10 cm subtends a right angle at the centre. Find the area of the corresponding minor segment of the circle. (Use $\pi = 3.14$)	2
	Section C	
	Section C consists of 6 questions of 3 marks each.	
Q26	Prove that $\sqrt{5}$ is an irrational number.	3
Q27	Find the zeroes of the quadratic polynomial $x^2 + 7x + 10$, and verify the relationship between the zeroes and the coefficients.	3
Q28	The difference between two numbers is 26 and one number is three times the other. Find them.	3
	OR	
Q28	Solve for x and y, graphically: $2x + y - 6 = 0$, $4x - 2y - 4 = 0$	3

Q29	In given figure, find tan P – cot R.  	3
	OR	
Q29	Prove that sec A (1 – sin A) (sec A + tan A) = 1.	3
Q30	Prove that the lengths of tangents drawn from an external point to a circle are equal.	3
Q31	A game of chance consists of spinning an arrow which comes to rest pointing at one of the numbers 1, 2, 3, 4, 5, 6, 7, 8 (see given figure), and these are equally likely outcomes. What is the probability that it will point at: (i) 8 ? (ii) an odd number? (iii) a number greater than 2?  	3
	Section -D	
	Section D consists of 4 questions of 5 marks each	
Q32	A cottage industry produces a certain number of toys in a day. The cost of production of each toy (in rupees) was found to be 55 minus the number of toys produced in a day. On a particular day, the total cost of production was Rs 750. Find out the number of toys produced on that day.	5
Q33	Prove that if a line is drawn parallel to one side of a triangle to intersect the other two sides in distinct points, the other two sides are divided in the same ratio.	5
Q34	A tent is in the shape of a cylinder surmounted by a conical top. If the height and diameter of the cylindrical part are 2.1 m and 4 m respectively, and the slant height of the top is 2.8 m, find the area of the canvas used for making the tent. Also, find the cost of the canvas of the tent at the rate of Rs500 per m^2. (Note that the base of the tent will not be covered with canvas.)	5
	OR	
Q34	Rachel, an engineering student, was asked to make a model shaped like a cylinder with two cones attached at its two ends by using a thin aluminium sheet. The diameter of the model is 3 cm and its length is 12 cm. If each cone has a height of 2 cm, find the volume of air contained in the model that Rachel made. (Assume the outer and inner dimensions of the model to be nearly the same.)	5
Q35		5

	The following distribution shows the daily pocket allowance of children of a locality. The mean pocket allowance is ₹ 18. Find the missing frequency f. <table><tr><td>Daily pocket allowance (in Rs)</td><td>11-13</td><td>13-15</td><td>15-17</td><td>17-19</td><td>19-21</td><td>21-23</td><td>23-25</td></tr><tr><td>Number of children</td><td>7</td><td>6</td><td>9</td><td>13</td><td>f</td><td>5</td><td>4</td></tr></table>	
	OR	
Q35	The distribution below gives the weights of 30 students of a class. Find the median weight of the students. <table><tr><td>Weight (in kg)</td><td>40-45</td><td>45-50</td><td>50-55</td><td>55-60</td><td>60-65</td><td>65-70</td><td>70-75</td></tr><tr><td>Number of students</td><td>2</td><td>3</td><td>8</td><td>6</td><td>6</td><td>3</td><td>2</td></tr></table>	5
	SECTION – E **(Case-study Based Questions)** **This section comprises of 3 case-study based questions of 4 marks each with three sub-parts.**	
Q36	Myra, a student of class 10^{th}, decides to save money every week. She starts by saving ₹100 in the first week, and from the second week onwards, she increases her weekly saving by ₹20. She plans to continue this saving pattern for 20 weeks. Now answer the following Questions: (i) Find the difference between Myra's savings in 9^{th} week and 10^{th} week. (ii) How much will Myra save in the 7th week? 1 (iii) What is the total amount saved in 20 weeks? 1 **OR** What is the total amount saved if she continues this saving pattern for 5 weeks more? 2	

Q37	From a point P on the ground the angle of elevation of the top of a 10 m tall building is 30°. A flag is hoisted at the top of the building and the angle of elevation of the top of the flagstaff from P is 45°.  **Now answer the following Questions:** (i) What is the value of $sin^2 60^0 + cos^2 60^0$? (ii)What is the distance of the building from P? (iii) What is distance between point A and point D? **OR** What is the length of the flagstaff?	 1 1 2
Q38	Given figure shows the arrangement of desks in a classroom. Ashima, Bharti and Camella are seated at A (3, 1), B (6, 4) and C (8, 6) respectively.  **Now answer the following questions:** (i) What is the distance between Ashima and Bharti? (ii) What is the distance between Ashima and Camella? (iii) Find the coordinates of the midpoint of line segment AC. **OR** Find the coordinates of the point which divides line segment joining B(6, 4) and C(8, 6) in the ratio 2:3 .	 1 1 2 2