KENDRIYA VIDYALAYA SANGATHAN, SILCHAR REGION

PRE-BOARD EXAMINATION: 2025-26

CLASS 10

SUB: MATHEMATICS BASIC (CODE: 241)

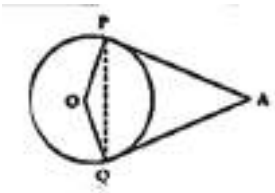
Time Allowed: 3 Hours Maximum Marks: 80

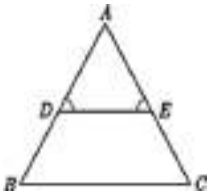
General Instructions:

Read the following instructions carefully and follow them:

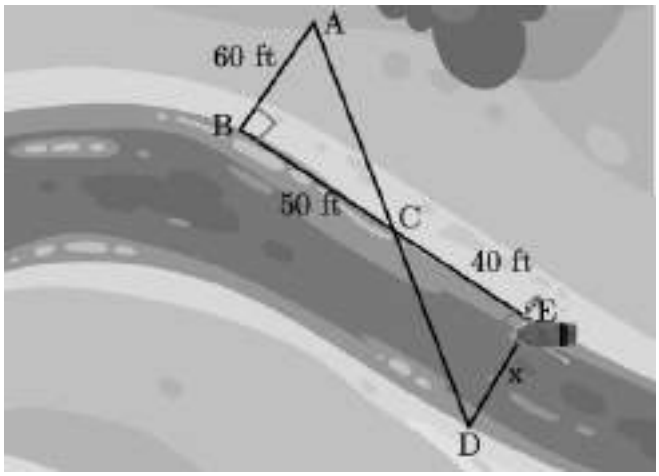
1. This question paper contains 38 questions.
2. This Question Paper is divided into 5 Sections A, B, C, D and E.
3. In Section A, Questions no. 1-18 are multiple choice questions (MCQs) and questions no. 19 and 20 are Assertion- Reason based questions of 1 mark each.
4. In Section B, Questions no. 21-25 are Very Short Answer (VSA) type questions, carrying 02 marks each.
5. In Section C, Questions no. 26-31 are Short Answer (SA) type questions, carrying 03 marks each.
6. In Section D, Questions no. 32-35 are Long Answer (LA) type questions, carrying 05 marks each.
7. In Section E, Questions no. 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. All Questions are compulsory. 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.
10. Take π =22/7 wherever required if not stated.
11. Use of calculators is not allowed.

Q.No	SECTION-A (1 Marks Each)	Marks
1	In an AP, if d = - 4 , n = 7 and a_n= 4, then 'a' is equal to (a) 6 (b) 7 (c) 20 (d) 28	1
2	The distance of point (-3, 4) from origin is: (a) -5 units (b) 6 units (c) 1Unit (d) 5 units	1
3	The prime factorization of 1250 is (a) 2 x 5^4 (b) 2 x 3 x 5^4 (c) 2x5^6 (d) 5^4 x 3 x 5	1
4	A quadratic polynomial whose zeroes are $\frac{2}{5}$ and $\frac{-1}{5}$ is (a) $25x^2+5x-2$ (b) $5x^2-2x+1$ (c) $5x^2+2x-1$ (d) $25x^2-5x-2$	1

5	A die is thrown once, then the probability of getting a prime number is …….. (a) $\frac{1}{6}$ (b) $\frac{1}{2}$ (c) 1 (d) 0	1
6	The graph of a quadratic polynomial will open upwards when (a) b>0 (b) a<0 (c) a>0 (d)b<0	1
7	The pair of equations 3x+2y+7=0 and 6x+4y+14=0 has (a) Unique solution (b) exactly two solution (c) infinitely many solution (d) no solution	1
8	The distance between the points (a,b) and $(-a,-b)$ is (a)$\sqrt{a^2+b^2}$ (b) a^2+b^2 (c) $2\sqrt{a^2+b^2}$ (d) $4\sqrt{a^2+b^2}$	1
9	The total surface area of solid hemisphere of radius r is (a) πr^2 (b) $2\pi r^2$ (c) $3\pi r^2$ (d) $4\pi r^2$	1
10	The median and mode respectively of a frequency distribution are 26 and 29, Then its mean is (a) 29.5 (b) 24.5 (c) 25.4 (d) 26.8	1
11	Which of the following cannot be the probability of an event? (a) 0.4 (b) 4% (c) 0.004% (d) 4	1
12	If y cot 45° cos60° = sin 30° sin 90° , then the value of y is (a) 1/2 (b) -1 (c) 1 (d) 2	1
13	In given fig. AP and AQ are tangents to the circle with O, from an external point A. If ∠PAQ = 70°, then ∠APQ is equal to ... (a) 35° (b) 55° (c) 110° (d) 125° 	1
14	For the following distribution: Class | 0-5 | 5-10 | 10-15 | 15-20 | 20-25 Frequency | 11 | 28 | 24 | 18 | 19 the upper limits of the modal class is (a)10 (b) 15 (c) 20 (d) 25	1
15	The zeroes of the polynomial p(x) = $x^2-3x-m(m+3)$ are (a) m , m + 3 (b) − m , (m + 3) (c) m , − (m + 3) (d) − m , − (m + 3)	1
16	Given that sinα = $\frac{\sqrt{3}}{2}$ and cosβ = 0 , then the value of β – α is (a) 0° (b) 30° (c) 90° (d) 60°	1
17	If one root of the quadratic equation $ax^2+bx+c=0$ is the reciprocal of the other, then (a) b = c (b) a = b (c) ac = 1 (d) a = c	1
18	The shape of an ice-cream cone is a combination of:	1

	(a) Sphere + cylinder (b) Sphere + cone (c) Hemisphere + cylinder (d) Hemisphere + cone	
	Directions for question 19 & 20 : In the following questions, a statement of Assertion (A) is followed by a statement of Reason (R). Mark the correct choice as: (a) Both Assertion and Reason are true and Reason is the correct explanation of Assertion. (b) Both Assertion and Reason are true but Reason is not the correct explanation of Assertion. (c) Assertion is true but Reason is false. (d) Assertion is false but Reason is true.	
19	Assertion (A): The point (0, 5) lies on y-axis. Reason(R): The x-coordinate of a point on y-axis is zero	1
20	Assertion: The probability of winning a game is 0.4, then the probability of losing it, is 0.6. Reason: P(E) + P (not E) = 1	1
	SECTION-B (2 MARKS)	
21	All red face cards are removed from a pack of playing cards. The remaining cards were well shuffled and then a card is drawn at random from them. Find the probability that the drawn card is (i) a red card (ii) a face card	2
22	Is the system of linear equations 2x +3y -9 =0 and 4x +6y =18 consistent? Justify your answer	2
23	23(A) If tan (A + B) = $\sqrt{3}$ and tan (A – B) = $1/\sqrt{3}$; 0° < A + B ≤ 90°; A > B, find A and B. OR 23(B) Prove that: $sec^4A - sec^2A = tan^4A + tan^2A$	2
24	Find the LCM and HCF of 6 and 20 by the prime factorisation method.	2
25	(A) S and T are point on sides PR and QR of ΔPQR such that ∠P =∠RTS. Show that ΔRPQ ~ ΔRTS. OR (B) In the given figure $\frac{AD}{DB} = \frac{AE}{EC}$ and ∠D = ∠E then prove that- △BAC is isosceles triangle  	2
	SECTION-C (3MARKS)	
26	26(A) Prove that √2 is an irrational number. OR 26(B) Show that 5 – $\sqrt{3}$ is irrational	3

27	Prove that $secA(1 - sinA)(secA + tanA) = 1$	3
28	28(A) Prove that the angle between the two tangents drawn from an external point to a circle is supplementary to the angle subtended by the line segment joining the points of contact at the centre. OR 28(B) Prove that "The lengths of tangents drawn from an external point to a circle are equal."	3
29	Find the coordinates of the point which divides the line segment joining the points $(4, -3)$ and $(8,5)$ in the ratio $3:1$ internally.	3
30	4 chairs and 3 tables cost ₹ 2100 and 5 chairs and 2 tables cost ₹ 1750. Find the cost of one chair and one table separately.	3
31	2 cubes each of volume 64 cm^3 are joined end to end. Find the surface area of the resulting cuboid.	3
	SECTION-D (5 MARKS)	
32	State and prove Basic Proportionality Theorem.	5
33	33(A) From the top of a 9 m high building, the angle of elevation of the top of a cable tower is 60◦ and angle of depression of its foot is 45◦. Determine the height of the tower and distance between building and tower. OR 33(B) As observed from the top of a 75 m high lighthouse from the sea level, the angles of depression of two ships are 30◦ and 45◦. If one ship is exactly behind the other on the same side of the lighthouse, find the distance between the two ships (Use √3=1.732)	5
34	The perimeter of certain sector of a circle of radius 5.6m is 20.0 m. Find the area of the sector.	5
35	35 (A) A contract on construction job specifies a penalty for delay of completion beyond a certain date as follows: ` 200 for the first day, ` 250 for the second day, ` 300 for the third day, etc., the penalty for each succeeding day being ` 50 more than for the preceding day. How much money the contractor has to pay as penalty, if he has delayed the work by 30 days? OR 35(B) In a school, students thought of planting trees in and around the school to reduce air pollution. It was decided that the number of trees, that each section of each class will plant, will be the same as the class, in which they are studying, e.g., a section of Class I will plant 1 tree, a section of Class II will plant 2 trees and so on till Class XII. There are three sections of each class. How many trees will be planted by the students?	5

	SECTION-E(4MARKS)	
36	A small cottage industry specializes in producing pottery articles. On a particular day, the industry observed a relationship between the number of articles produced and the cost of production for each article. It was observed that the cost of production of each article (in Rupees) was 3 more than twice the number of articles produced on that day. The total cost of production on that specific day was ₹90 (i) Forming the Equation (ii) determine the nature of the roots of the quadratic equation formed in part (i) (iii)(a) Finding the Number of Articles and Cost OR (iii)(b) If the industry also paid a fixed daily production cost of ₹10 (in addition to the per-article cost) and the total cost remained ₹90, find the equation.	 1 1 2
37	Tania is very intelligent in Maths. She always tries to relate the concept of Maths in daily life. One day she plans to cross a river and want to know how far it is to the other side. She takes measurements on her side of the river and make the drawing as shown below.  (i) Which similarity criterion is used in solving the above problem ? (ii) Consider the following statement : S1 : ∠ACB = ∠DCE S2: ∠ BAC = ∠CDE Which of the above statement is/are correct. (a) S1 and S2 both (b) S1 (c) S2 (d) None (iii)(A) What is the distance x across the river?	 1 1

	OR (iii)(B) What is the approximate length of AC shown in the figure?	2
38	A survey was conducted on 200 families of a village to find out the distribution of their total monthly household expenditure. The results of the survey are given in the table below: Expenditure (in ₹) | Number of Families (f_i) 1000 - 1500 | 24 1500 - 2000 | 40 2000 - 2500 | 33 2500 - 3000 | 28 3000 - 3500 | 30 3500 - 4000 | 22 4000 - 4500 | 16 4500 - 5000 | 7 Based on the information above, answer the following questions: (i) What is the class mark (x_i) of the class $3000 - 3500$? (ii) What is the modal class for this data? (iii)(A) Calculate the Mode of the monthly expenditure. OR (iii)(B) Find the Median class and its lower limit (l).	1 1 2