COMMON PRE-BOARD EXAMINATION

MATHEMATICS (STANDARD)–Code No. 041

CLASS-X-(2025-26)

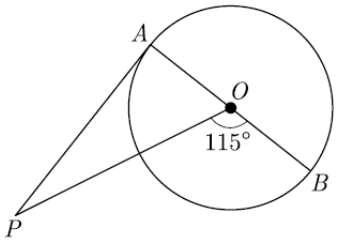
SET: 2

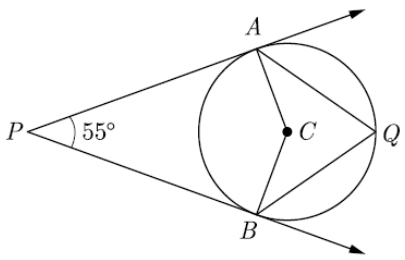
Time allowed: 3 Hrs. **Maximum Marks: 80**

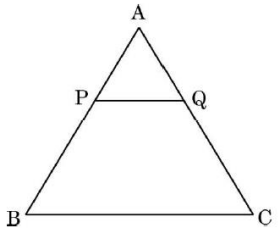
General Instructions:

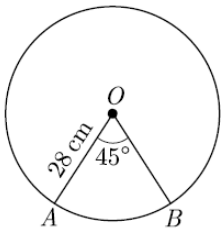
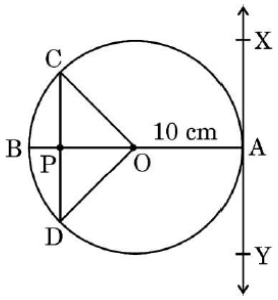
Read the following instructions very carefully and follow them:

1. This Question Paper has 5 Sections A - E.
2. Section **A** has 20 Multiple Choice Questions (MCQs) carrying 1 mark each.
3. Section **B** has 5 questions carrying 02 marks each.
4. Section **C** has 6 questions carrying 03 marks each.
5. Section **D** has 4 questions carrying 05 marks each.
6. Section **E** has 3 Case Based integrated units of assessment (04 marks each) with sub-parts of the values of 1, 1 and 2 marks each respectively.
7. All Questions are compulsory. However, an internal choice in 2 Qs of 5 marks, 2 Qs of 3 marks and 2 Questions of 2 marks has been provided. An internal choice has been provided in the 2 marks questions of Section E.
8. Draw neat figures wherever required. Take $\pi = \frac{22}{7}$, wherever required if not stated.

	SECTION – A	
	This section has 20 Multiple Choice Questions (MCQs) carrying 1 mark each.	
1.	In the given figure, PA is a tangent from an external point P to a circle with centre O. If ∠POB = 115°, ∠APO is  A) 25° B) 20° C) 30° D) 65°	1
2.	(cot θ + tan θ) equals: A) cosec θ sec θ B) sin θ sec θ C) cos θ tan θ D) sin θ cos θ	1
3.	The distance of the point (4, 0) from x-axis is: A) 4 units B) 16 units C) 0 units D) 4 units	1

4.	A sector is cut from a circular sheet of radius 100 cm, the angle of the sector being 240°. If another circle of the area same as the sector is formed, then radius of the new circle is A) 79.5 cm B) 81.5 cm C) 83.4 cm D) 88.5 cm	1
5.	The lines $3x + 2y = 12$ and $6x + 4y = 24$ are A) intersecting B) parallel C) coincident D) none of these	1
6.	If the equation $(m^2+ n^2)^2 - 2(mp + nq)x + p^2 + q^2 = 0$ has equal roots, then A) $mp = nq$ B) $mq = np$ C) $mn = pq$ D) $mq = \sqrt{np}$	1
7.	For the cubic polynomial $x^3 - 6x^2 + 11x - 6$, the sum and product of its zeros are: A) Sum=6, Product = −6 B) Sum = −6, Product = 6 C) Sum = 6, Product = 6 D) Sum = 11, Product = −6	1
8.	In a cricket match, a batsman hits the boundary 7 times out of the 42 balls he plays. The probability of his not hitting a boundary is: A) $\frac{1}{7}$ B) $\frac{2}{7}$ C) $\frac{5}{6}$ D) $\frac{1}{6}$	1
9.	If the point P (6, 2) divides the line segment joining A (6, 5) and B (4, y) in the ratio 3 :1 then the value of y is A) 4 B) 3 C) 2 D) 1	1
10.	The median and mode respectively of a frequency distribution are 26 and 29, Then its mean is A) 27.5 B) 24.5 C) 28.4 D) 25.8	1
11.	The volume of a right circular cone whose area of the base is 156 cm^2 and the vertical height is 8 cm, is: A) 2496 cm^3 B) 1248 cm^3 C) 1664 cm^3 D) 416 cm^3	1
12.	If $\sec\theta - \tan\theta = m$, then the value of $\sec\theta + \tan\theta$ is A) $1 - \frac{1}{m}$ B) $m^2 - 1$ C) $\frac{1}{m}$ D) $-m$	1
13.	In the given figure, PA and PB are tangents from external point P to a circle with centre C and Q is any point on the circle. Then the measure of ∠ACB is  A) $62\frac{1}{2}^\circ$ B) 125° C) 55° D) 90°	1

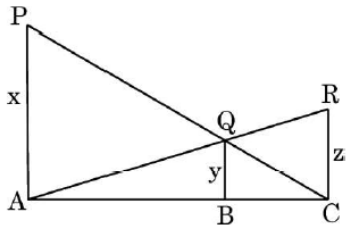
14.	If p (x) = $x^2 - 5x + 6p$, the zeros of the polynomial are: A) 1, 6 B) 2, 3 C) −2, 3 D) −1, −6	1
15.	If the HCF of 65 and 117 is expressed as 65 m + 117 n, then the values of m and n are: A) m = 2, n = −1 B) m = 4, n = −3 C) m = −2, n = 1 D) m = 3, n = −2	1
16.	If a large circular pizza is divided into 5 equal sectors, then the central angle of each sector will be: A) 60° B) 90° C) 45° D) 72°	1
17.	If one of the zeros of the quadratic polynomial $6x^2+x-2$ is $\frac{2}{3}$, the other zero is: A) $\frac{-1}{2}$ B) $\frac{1}{2}$ C) $\frac{-2}{3}$ D) $\frac{3}{2}$	1
18.	In the given figure, PQ‖BC. If $\frac{AP}{PB} = \frac{4}{13}$ and AC = 20.4 cm, then the length of AQ is :  A) 2·8 cm B) 5·8 cm C) 3·8 cm D) 4·8 cm	1
	Questions number 19 and 20 are Assertion and Reason based questions. Two statements are given, one labelled as Assertion (A) and the other is labelled as Reason (R). Select the correct answer to these questions from the codes (A), (B), (C) and (D) as given below. (A) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of the Assertion (A). (B) Both Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation of the Assertion (A). (C) Assertion (A) is true, but Reason (R) is false. (D) Assertion (A) is false, but Reason (R) is true.	
19.	Assertion (A) : The probability of selecting a number at random from the numbers 1 to 20 is 1. Reason (R): For any event E, if P(E) = 1, then E is called a sure event.	1
20.	Assertion : The value of sin θ = $\frac{4}{3}$ is not possible. Reason: Hypotenuse is the largest side in any right angled triangle.	1
	SECTION – B	

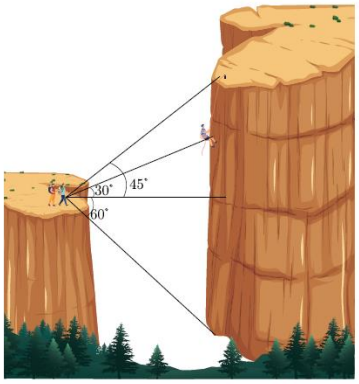
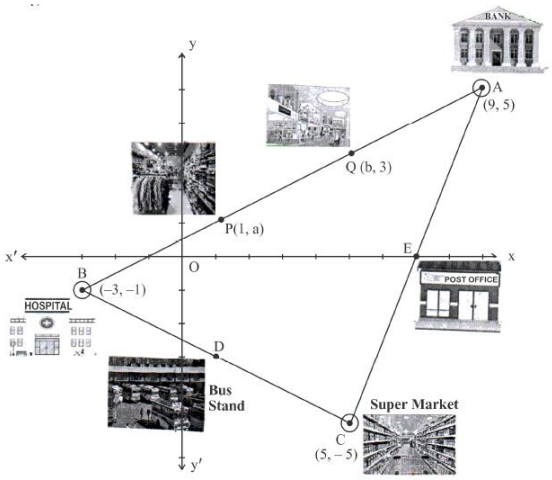
	This section has 5 Very Short Answer (VSA) type questions carrying 2 marks each.	
21.	a) Evaluate: $\frac{tan^2\ 60°}{sin^2\ 60° + cos^2\ 30°}$ **OR** b) If $\sqrt{3}$ sin θ – cos θ = 0 and 0º < θ < 90º, find the value of θ.	2
22.	Find the area of the corresponding major sector of a circle of radius 28 cm and the central angle 45°. 	2
23.	a) If five times the fifth term of an AP is equal to eight times its eighth term, show that its 13th term is zero. **OR** b) What is the sum of five positive integer divisible by 6.	2
24.	ABCD is a trapezium in which AB‖CD and its diagonals intersect each other at the point O. Show that $\frac{AO}{BO} = \frac{CO}{DO}$.	2
25.	Prove that the parallelogram circumscribing a circle is a rhombus.	2
	SECTION – C	
	This section has 6 Short Answer (SA) type questions carrying 3 marks each.	
26.	At point A on the diameter AB of a circle of radius 10 cm, tangent XAY is drawn to the circle. Find the length of the chord CD parallel to XY at a distance of 16 cm from A. 	3
27.	If α and β are the zeroes of a quadratic polynomial such that α + β = 24 and α − β = 8. Find the quadratic polynomial having α and β as its zeroes.	3

28.	a) Seven times a two-digit number is equal to four times the number obtained by reversing the order of its digits. If the difference of the digits is 3, determine the number. **OR** b) Determine the values of m and n so that the following system of linear equation have infinite number of solutions: $(2m - 1)x + 3y - 5 = 0$ $3x + (n - 1)y - 2 = 0$	3
29.	Prove that : $2(\sin^6\theta + \cos^6\theta) - 3(\sin^4\theta + \cos^4\theta) + 1 = 0$.	3
30.	a) Prove that $\sqrt{5}$ is an irrational number. **OR** b) In a teachers' workshop, the number of teachers teaching French, Hindi and English are 48, 80 and 144 respectively. Find the minimum number of rooms required if in each room the same number of teachers are seated and all of them are of the same subject.	3
31.	A game consists of tossing a one-rupee coin three times and noting its outcome each time. Find the probability of getting: (i) three heads, (ii) at least two tails.	3
	SECTION – D	
	This section has 4 Long Answer (LA) type questions carrying 5 marks each.	
32.	a) A solid toy is in the form of a hemisphere surmounted by a right circular cone. The height of the cone is 2 cm and the diameter of the base is 4 cm. Determine the volume of the toy. Also, find the surface area of the toy. (Take $\pi = 3{\cdot}14$) **OR** b) A circus tent is in the shape of a cylinder surmounted by a conical top of same diameter. If their common diameter is 56 m, the height of cylindrical part is 6 m and the total height of the tent above the ground is 27 m, find the area of canvas used in the tent.	4
33.	One fourth of a herd of camels was seen in forest. Twice of square root of the herd had gone to mountain and remaining 15 camels were seen on the bank of a river, find the total number of camels.	4

34.	The following distribution gives the weights of 60 students of a class. Find the mean and mode weights of the students.	4

Weight (in Kg)	40-44	44-48	48-52	52-56	56-60	60-64	64-68	68-72
Number of students	4	6	10	14	10	8	6	2

35.	a) In the given figure, PA, QB and RC are perpendicular to AC. If PA = x units, QB = y units and RC = z units, prove that $\frac{1}{X} + \frac{1}{Z} = \frac{1}{Y}$.  **OR** b) State and prove Basic Proportionality theorem.	4
	SECTION – E	
36.	Computer Animations: The animation on a new computer game initially allows the hero of the game to jump a (screen) distance of 10 inch over booby traps and obstacles. Each successive jump is limited to $\frac{3}{4}$ inch less than the previous one. (i) Find the length of the seventh jump. (ii) Find the total distance covered after seven jumps. (iii) (a) What is the total distance covered in the first 20 jumps? **OR** (b) Find the distance of the 15th jump made by the hero. 	1 1 2

37.	Height of a Climber: Himalayan Trekking Club has just hiked to the south rim of a large canyon, when they spot a climber attempting to scale the taller northern face. Knowing the distance between the sheer walls of the northern and southern faces of the canyon is approximately 150 meter, they attempt to compute the distance remaining for the climbers to reach the top of the northern rim.  Using a homemade transit, they sight an angle of depression of 60° to the bottom of the north face, and angles of elevation of 30° and 45° to the climbers and top of the northern rim respectively. i) What is the horizontal distance between the climber and the bottom of the north face at that moment? ii) a) How high is the southern rim of the canyon? **OR** b) How high is the northern rim? iii) How much farther until the climber reaches the top?	1 2 1
38.	Steve, a software engineer, lives in Muscat for his work. He lives in the most convenient area of the city from where bank, hospital, post office and supermarket can be easily accessed. In the graph, the bank is plotted as A (9, 5), hospital as B (– 3, – 1) and supermarket as C (5, – 5) such that A, B, C form a triangle.  	

	Based on the above given information, answer the following questions:	
	(i) Find the distance between the bank and the hospital.	1
	(ii) In between the bank and the supermarket, there is a post office plotted at E which is their mid-point. Find the coordinates of E.	1
	(iii) (a) In between the hospital and the supermarket, there is a bus stop plotted as D, which is their mid-point. If Steve wants to reach the bus stand from the bank, then how much distance does he need to cover?	2
	OR	
	(b) P and Q are two different garment shops lying between the bank and the hospital, such that BP = PQ = QA. If the coordinates of P and Q are (1, a) and (b, 3) respectively, then find the values of 'a' and 'b'.	
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