COMMON PRE-BOARD EXAMINATION

MATHEMATICS (STANDARD)–Code No. 041

CLASS-X-(2025-26)

SET: 2

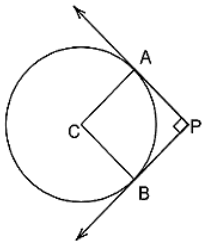
Time allowed: 3 Hrs. **Maximum Marks: 80**

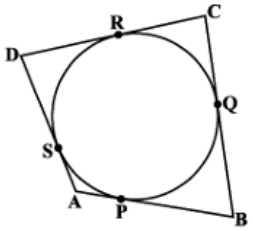
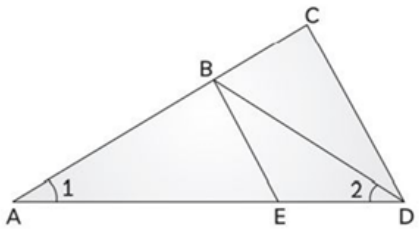
General Instructions:

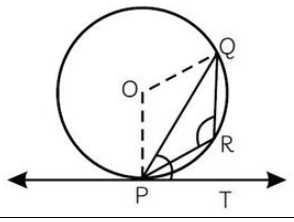
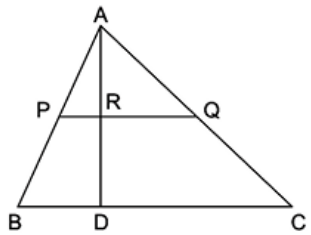
Read the following instructions very carefully and follow them:

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.

Q. No.	Questions	Marks
	(Section A) **Section A consists of 20 questions of 1 mark each.**	
1.	The graph of the polynomial $p(x) = 2x - 5$ is a straight line that intersects the x-axis at exactly one point namely _____. (A) $\left(\frac{-5}{2}, 0\right)$ (B) $\left(0, \frac{-5}{2}\right)$ (C) $\left(\frac{5}{2}, 0\right)$ (D) $\left(\frac{5}{2}, \frac{-5}{2}\right)$	1
2.	If $\Delta ABC \sim \Delta EDF$ and ΔABC is not similar to ΔDEF, then which of the following is not true? (A) $BC.EF = AC.FD$ (B) $AB.EF = AC.DE$ (C) $BC.DE = AB.EF$ (D) $BC.DE = AB.FD$	1
3.	The midpoint of the line segment AB joining $A(-2, 8)$ and $B(-6, 4)$ is _____. (A) $(2, 6)$ (B) $(-4, 12)$ (C) $(-4, 6)$ (D) $(4, -6)$	1
4.	If an arc subtends an angle of $90°$ at the centre of a circle, then the ratio of its length to the circumference of the circle is _____. (A) 2: 3 (B) 1: 4 (C) 4: 1 (D) 1: 3	1
5.	The sum of exponents of prime factors in the prime-factorisation of 196 is _____. (A) 3 (B) 4 (C) 5 (D) 6	1

6.	If tangents PA and PB from a point P to a circle with centre O are inclined to each other at an angle of 80°, the $\angle POA$ is equal to _____. (A) 50° (B) 60° (C) 70° (D) 80°	1
7.	The required solution of $4x^2 - 25x = 0$ is _____. (A) $x = 0, x = \frac{12}{7}$ (B) $x = 0, x = \frac{25}{4}$ (C) $x = 1, x = \frac{5}{9}$ (D) $x = 1, x = \frac{12}{7}$	1
8.	If $4\ tan\ \theta = 3$, then $\frac{4\ sin\ \theta - cos\theta}{4\ \sin\theta + \cos\theta}$ is equal to _____. (A) $\frac{2}{3}$ (B) $\frac{1}{3}$ (C) $\frac{1}{2}$ (D) $\frac{3}{4}$	1
9.	The volume of the two spheres is in the ratio 64: 27. The ratio of their surface areas is _____. (A) 3: 4 (B) 4: 3 (C) 9: 16 (D) 16: 9	1
10.	At a fun fair, a person can win a prize if she draws either a spade or an ace from a deck of 52 cards. The probability of her losing is _____. (A) $\frac{9}{13}$ (B) $\frac{4}{13}$ (C) $\frac{17}{52}$ (D) $\frac{35}{52}$	1
11.	The pair of linear equation $3x + 5y = 3$ and $6x + ky = 8$ do not have a solution, if k is _____. A) 5 (B) 10 (C) 15 (D) 20	1
12.	The distance of the point $P(2,3)$ from the $x - axis$ is _____. (A) 2 units (B) 3 units (C) 1 unit (D) 5 units	1
13.	$\frac{tan\ \theta \times cosec^2\theta}{sec\theta}$ is equal to _____. (A) $sec\theta$ (B) $cosec\theta$ (C) $cot\ \theta$ (D) $tan\ \theta$	1
14.	In the given figure, PA and PB are two tangents drawn from an external point P to a circle with centre C and radius 4cm. If PA ⊥ PB, then the length of each tangent is _____.  (A) 3 cm (B) 4 cm (C) 5 cm (D) 6 cm	1
15.	The minute hand of a clock is 84 cm long. The distance covered by the tip of minute hand from 10:10 am to 10:25 am is _____. (A) 44 cm (B) 88 cm (C) 132 cm (D) 176 cm	1
16.	If the sum of LCM and HCF of two numbers is 1260 and their LCM is 900 more than their HCF, then the product of two numbers is _____. (A) 205400 (B) 203400 (C) 194400 (D) 198400	1
17.	If the probability of an event is p, the probability of its complementary event will be _____. (A) p –1 (B) p (C) 1 – p (D) 1 – $\frac{1}{p}$	1
18.	If the mode and mean of the data are 30.6 and 29.2 respectively, then the median of the data is _____. (A) 27.8 (B) 29.6 (C) 59.1 (D) 33.4	1
	DIRECTIONS: In the question number 19 and 20, a statement of **Assertion (A)** is	

	followed by a statement of **Reason (R)**. **Choose the correct option**: (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 and 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.	
19.	**Assertion (A):** The HCF of two numbers is 18 and their product is 3072. Then their LCM is 169. **Reason (R):** If a, b are two positive integers, then $HCF \times LCM = a \times b$.	1
20.	**Assertion (A):** In a right ΔABC, right angled at B, if $tan\ A = 1$, then $2\ sinA.cosA = 1$. **Reason (R):** $tan\ 45° = 1$ and $sin\ 45° = cos\ 45° = \frac{1}{\sqrt{2}}$.	1
	(Section – B) **Section B consists of 5 questions of 2 marks each.**	
21.	Points $A(-1, y)$ and $B(5,7)$ lie on a circle with centre $O(2, -3y)$ such that AB is a diameter of the circle. Find the value of y. Also, find the radius of the circle. **OR** A quadrilateral $ABCD$ is drawn to circumscribe a circle. Prove that $AB + CD = AD + BC$.  	2
22.	How many multiples of 7 lie between 20 to 300? **OR** How many terms of the A.P. 27, 24, 21, … should be taken so that their sum is zero?	2
23.	$ABCD$ is a trapezium in which $AB \parallel CD$ and its diagonals intersect each other at the point O. Using a similarity criterion of two triangles, show that $\frac{OA}{OC} = \frac{OB}{OD}$. **OR** In the given figure below, $\frac{AD}{AE} = \frac{AC}{BD}$ and $\angle 1 = \angle 2$. Show that $\Delta\ BAE \sim \Delta CAD$.  	2
24.	Prove that: $(\sqrt{3}+1)(3 - \cot 30°) = tan^3 60° - 2 \sin 60°$	2

25.	In figure, PQ is a chord of a circle with centre O and PT is a tangent. If $\angle QPT = 60°$, find $\angle PRQ$.  	2
	(Section – C) **Section C consists of 6 questions of 3 marks each.**	
26.	The area of a rectangle gets reduced by 9 square units, if its length is reduced by 5 units and breadth is increased by 3 units. If we increase the length by 3 units and the breadth by 2 units, the area increases by 67 square units. Find the dimensions of the rectangle. **OR** Two numbers are in the ratio of 1 : 3. If 5 is added to both the numbers, the ratio becomes 1 : 2. Find the numbers.	3
27.	Prove that $7 - 2\sqrt{3}$ is irrational given that $\sqrt{3}$ is irrational.	3
28.	If α and β are zeros of a polynomial $x^2 + 6x + 9$, then form a polynomial whose zeroes are $-\alpha$ and $-\beta$.	3
29.	Two dice are thrown simultaneously. What is the probability that: (i) 6 will come up on at least one? (ii) 6 will not come up on either of them. (iii) 6 will come up at both dice.	3
30.	If $7\ sin^2A + 3\ cos^2A = 4$, show that $tan\ A = \frac{1}{\sqrt{3}}$. **OR** Prove that $\frac{\sin\theta - \cos\theta + 1}{\sin\theta + \cos\theta - 1} = \sec\theta + \tan\theta$	3
31.	If PQ is a tangent drawn from an external point P to a circle with centre O and QOR is a diameter where length of QOR is 8 cm such that $\angle POR = 120°$, then find OP and PQ.	3
	(Section – D) **Section D consists of 4 questions of 5 marks each.**	
32.	(i) State and Prove basic proportionality theorem. (ii) In the given figure, AP = 3 cm, AR = 4.5 cm, AQ = 6 cm, AB = 5 cm, AC = 10 cm. Find the length of AD.  	3 2
33.	Zeba's age is such that if she were 5 years younger than her present age, the square of that age would have been 11 more than five times her actual age. What is her age now?	5
34.	(A) The median of the following data is 525. Find the values of x and y if the total frequency is 100.	5

Class Interval	Frequency
0 – 100	2
100 – 200	5
200 – 300	x

300 – 400	12
400 – 500	17
500 – 600	20
600 – 700	y
700 – 800	9
800 – 900	7
900 - 1000	4

(OR)

(B) Commute the mean of the given data.

Income (in Rupees)	Number of workers
200 – 300	5
300 – 400	36
400 – 500	24
500 – 600	16
600 – 700	9
700 – 800	6
800 – 900	4

35. A tent is in 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 canvas used for making the tent. Also find the cost of canvas of the tent at the rate of ₹ 500 per m^2. — 5

OR

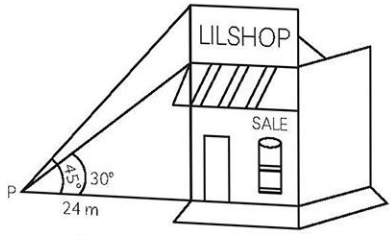
A solid wooden toy is in the form of a hemisphere surmounted by a cone of same radius. The radius of hemisphere is 3.5 cm and the total wood used in the making of toy is $166\ \frac{5}{6}\ cm^3$. Find the height of the toy. Also, find the cost of painting the hemispherical part of the toy at the rate of ₹ 10 per cm^2. (Take $\pi = \frac{22}{7}$)

(Section – E)

Section E consists of 3 case study-based questions of 4 marks each.

36. Anita purchased a new building for her business. Being in the prime location, she decided to make some more money by putting up an advertisement sign for a rental ad income on the roof of the building.

From a point P on the ground level, the angle of elevation of the roof of the building is 30° and the angle of elevation of the top of the sign board is 45°. The point P is at a distance of 24 m from the base of the building.



On the basis of the above information, answer the following questions:

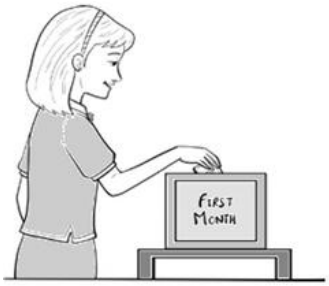
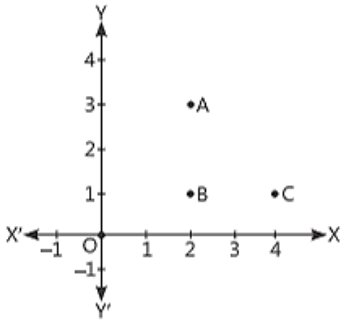
(i) (A) Find the height of the building (without the sign board). — 2

OR

(B) Find the height of the building (with the sign board) — 1

(ii) Find the height of the sign board. — 1

(iii) Find the distance of the point P from the top of the sign board. — 1

37.	 Ananya saves ₹ 24 during the first month ₹ 30 in the second month and ₹ 36 in the third month. She continues to save in this manner. On the basis of above information answer the following questions. (i) Whether the monthly savings of Ananya form an AP or not? If yes then write the first term and common difference. (ii) What is the amount that she will save in 15th month? (iii) (A) In which month, will she save ₹ 66? **OR** (B) What is the common difference of an AP whose nth term is $8 - 5n$?	1 1 2
38.	Alia and Shagun are friends living on the same street in Patel Nagar. Shagun's house is at the intersection of one street with another street on which there is a library. They both study in the same school and that is not far from Shagun's house. Suppose the school is situated at the point O, i.e., the origin, Alia's house is at A. Shagun's house is at B and library is at C.  Based on the above information, solve the following questions: (i) How far is Alia's house from Shagun's house? (ii) How far is the library from Shagun's house? (iii) (A) Show that for Shagun, school is farther compared to Alia's house and library. **OR** (B) Show that Alia's house, Shagun's house and library form an isosceles right triangle.	 1 1 2