

PRE-BOARD EXAMINATION (2025-26)
CLASS - X
MATHEMATICS (BASIC) – Code No. 241 (SET- 4)

Maximum marks:80 Time:3 hours

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 $\pi = 227$ wherever required if not stated.
10. Use of calculators is not allowed.

SECTION – A (Multiple Choice Questions) Each MCQ of 1mark, has four options with only one correct option, choose the correct option		
Q.No.	Question	Marks
Q1.	Let E be an event such that $P(\text{not}E) = \frac{1}{5}$, then $P(E)$ is equal to: A) $\frac{1}{5}$ B) 1 C) 0 D) $\frac{4}{5}$	1
Q2.	If $p(x) = x^2+5x+6$, then $p(-2)$ is: A)20 B)0 C)-8 D)8	1
Q3.	The mode of the numbers 2,3,3,4,5,4,4,5,3,4,2,6,7 is: A)2 B)3 C)4 D) 5	1
Q4.	How many tangents can be drawn to a circle from a point on it ? A)One B)Two C)Infinite D)Zero	1
Q5.	A quadratic equation whose one root is 2 and the sum of whose roots is zero, is : A) $x^2+4 = 0$ B) $x^2-2 = 0$ C) $4x^2-1 = 0$ D) $x^2- 4=0$	1

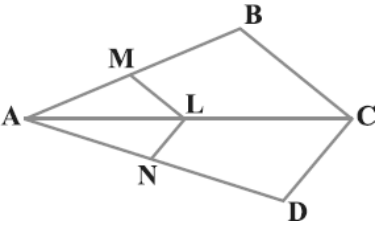
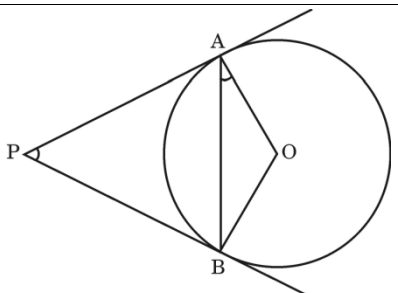
Q6.	Which one of the following is not a quadratic equation A) $(x + 2)^2 = 2(x + 3)$ B). $x^2 + 3x = (-1)(1 - 3x)^2$ C) $(x + 2)(x - 1) = x^2 - 2x - 3$ D) $x^3 - x^2 + 2x + 1 = (x + 1)^3$	1
Q7.	A quadratic polynomial whose sum and product of zeroes are 2 and -1 respectively is : A) $x^2 + 2x + 1$ B) $x^2 - 2x - 1$ C) $x^2 + 2x - 1$ D) $x^2 - 2x + 1$	1
Q8.	(HCF × LCM) for the numbers 30 and 70 is: A) 2100 B) 21 C) 210 D) 70	1
Q9.	The length of the arc of a circle of the radius 14 cm which subtends an angle of 60° at the centre of the circle is A) $44/3$ cm B) $88/3$ cm C) $308/3$ cm D) $616/3$ cm	1
Q10.	If the radius of a semi-circular protractor is 7 cm, then its perimeter is: A) 11 cm B) 14 cm C) 22 cm D) 36 cm	1
Q11.	The angle of elevation of the top of a 15 m high tower at a point $15\sqrt{3}$ m away from the base of the tower is: A) 30° B) 45° C) 60° D) 90°	1
Q12.	If in $\triangle ABC$, $\angle C = 90^\circ$, then $\sin(A + B) =$ A) 0 B) $\frac{1}{2}$ C) $1/\sqrt{2}$ D) 1	1
Q13.	A bag has 3 red balls and 5 green balls. If we take a ball from the bag, then what is the probability of getting a red ball? A) $3/5$ B) $5/8$ C) $3/8$ D) $8/3$	1
Q14.	If two positive integers A and B can be expressed as $A = xy^3$ and $B = x^4y^2z$; x, y being prime numbers, the LCM (A, B) is A) xy^2 B) x^4y^2z C) x^4y^3 D) x^4y^3z	1
Q15.	The lines represented by the given equations $4x + 2y = 16$ and $3x - y = 8$ are : A) Parallel B) Intersecting C) Coincident D) Perpendicular	1
Q16.	If $\triangle ABC \sim \triangle DEF$ and $\angle A = 47^\circ$, $\angle E = 83^\circ$, then $\angle C$ is equal: A) 47° B) 50° C) 83° D) 130°	1
Q17.	PQ and PR are the two tangents to a circle of centre O at the points Q and R on the circle if $\angle QPR = 40^\circ$, then $\angle QRO$ is A) 10° B) 20° C) 40° D) 140°	1
Q18.	If a pair of linear equations is consistent, then the lines will be A) always coincident B) parallel C) always intersecting D) intersecting or coincident	1

Each of the following questions contains two statements i.e., ASSERTION and REASON, and has following four choices.

- 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.

Only one of which is the correct answer.

Q19.	ASSERTION (A): If one root of the quadratic equation $4x^2 - 10x + (k-4) = 0$ is reciprocal of the other, then value of k is 8. REASON (R): Roots of the quadratic equation $x^2 - x + 1 = 0$ are real.	1
Q20.	ASSERTION (A): A tangent to a circle is perpendicular to the radius through the point of contact. REASON (R): The lengths of tangents drawn from an external point to a circle are equal.	1

SECTION – B (Very Short Answers) This section comprises of VSA of 2 marks each		
Q. No.	Question	Marks
Q21.	(A) Find the discriminant of the quadratic equation $3x^2 - 2x + 1/3 = 0$ and hence find the nature of its roots. OR (B) Find the roots of the quadratic equation $x^2 + x - 2 = 0$.	2
Q22.	In the given figure, if $LM \parallel CB$ and $LN \parallel CD$, prove that : $AM/AB = AN/AD$ 	2
Q23.	If $\cos(A + B) = 0$ and $\sin(A - B) = \sqrt{3}/2$, then find the value of A and B where A and B are acute angles.	2
Q24.	A) Find the coordinates of the point which divides the join of A(-1,7) and B(4,-3) in the ratio 2:3. OR B) Show that the points (-2, 3), (8, 3) and (6, 7) are the vertices of a right-angled triangle.	2
Q25.	PA and PB are tangents drawn to the circle with centre O as shown in the figure. Prove that $\angle APB = 2 \angle OAB$. 	2

SECTION – C
(Short Answers)

This section comprises of SA of 3 marks each

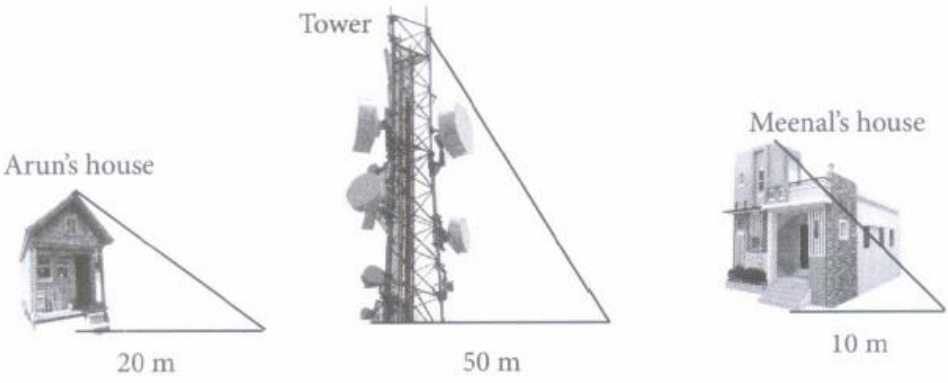
Q. No.	Question	Marks
Q26.	Find the area of the sector of a circle of radius 7cm and of central angle 90°. Also, find the area of corresponding major sector.	3
Q27.	If α, β are zeroes of the quadratic polynomial $x^2 - 5x + 6$, form another quadratic polynomial whose zeroes are $1/\alpha, 1/\beta$.	3
Q28.	A die is rolled once. Find the probability of getting: (i) An even prime number. (ii) A number greater than 4. (iii) An odd number.	3
Q29.	Prove that : $\frac{1+\tan^2 A}{1+\cot^2 A} = \left(\frac{1-\tan A}{1-\cot A}\right)^2 = \tan^2 A$	3
Q30.	(A) Two concentric circles with centre O are of radii 3 cm and 5 cm. Find the length of chord AB of the larger circle which touches the smaller circle at P. OR (B) Prove that the lengths of tangents drawn from an external point to a circle are equal.	3
Q31.	(A) If we add 1 to the numerator and subtract 1 from the denominator, a fraction reduces to 1. It becomes 1/2 if we only add 1 to the denominator. What is the fraction? OR (B) For which value of 'k' will the following pair of line are quations have no solution ? $3x + y = 1$ $(2k-1)x + (k-1)y = 2k+1$	

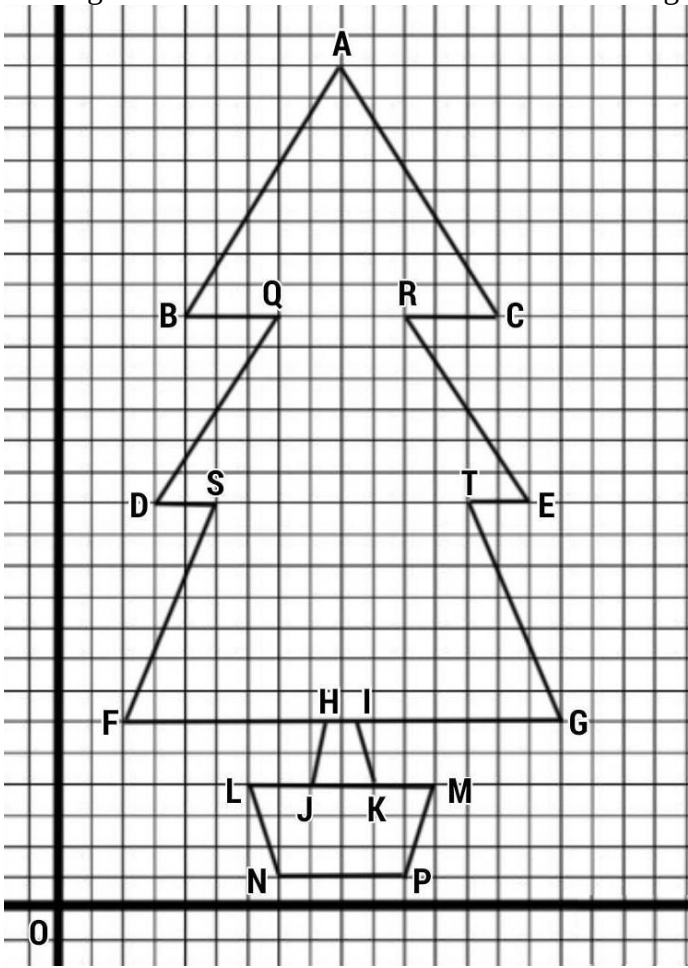
SECTION – D
(Long Answers)

This section comprises of LA type questions of 5 marks each

Q. No.	Question								Marks
Q32.	The distribution below gives the weights of 30 students of a class. Find the median weight of the students :								5
	Weight In kg	40-45	45-50	50-55	55-60	60-65	65-70	70-75	
	Number of Students	2	3	8	6	6	3	2	
Q33.	Find the sum of first 51 terms of an A.P. whose second and third terms are 14 and 18, respectively.								5

	OR	
	The first term of an A.P. is 5, the last term is 45 and the sum is 400. Find the number of terms and the common difference.	
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 Rs. 500 per m ² . (Note that the base of the tent will not be covered with canvas.)	5
Q35.	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. OR From the top of a building 50 m high, the angles of depression of the top and bottom of a tower are observed to be 30° and 60°. Find the height of the tower and distance between the building and the tower. (Take $\sqrt{3} = 1.73$)	5

SECTION - E (Case-study Based Questions) This section comprises of 3 case-study based questions of 4 marks each with three sub-parts.		
Q. No.	Question	Marks
Q36.	Meenal was trying to find the height of tower near his house. She is using the properties of similar triangles. The height of Meenal's house is 20 m. When Meenal's house casts a shadow of 10m long on the ground, at the same time, tower casts a shadow of 50 m long and Arun's house casts a shadow of 20 m long on the ground as shown below.  Based on the above information, answer the following questions. (i) What is the height of tower? (ii) What will be the length of shadow of tower when Meenal's house casts a shadow of 15 m? (iii) (a) If tower casts a shadow of 40 m, then find the length of shadow of Arun's house.	(1+1+2)

	OR (b) If tower casts a shadow of 40 m, then what will be the length of shadow of Meenal's house?	
Q37.	A design of Christmas tree is shown in the following graph:  Now answer the following questions: (i) What are the coordinates of the point G . (ii) Find the mid-point of AB. (iii) (a) Find the length of FS. OR (b) Find the distance between N and M .	(1+1+2)
Q38.	Khushi wants to organize her birthday party. Being health conscious, she decided to serve only fruits in her birthday party. She bought 36 apples and 60 bananas and decided to distribute fruits equally among all.	(1+1+2)



Based on the above information, answer the following questions :

- (i) How many guests Khushi can invite at the most ?
- (ii) How many apples and bananas will each guest get ?
- (iii) (a) If Khushi decides to add 42 mangoes, how many guests Khushi can invite at the most ?

OR

If Khushi decides to add 42 mangoes, how many apples, mangoes and bananas will each guest get ?