TECHNO INDIA GROUP PUBLIC SCHOOL

Mock Paper-II

Mathematics

Class—X (2025–26)

Time Allowed: **3 hours**   Maximum Marks: **80**
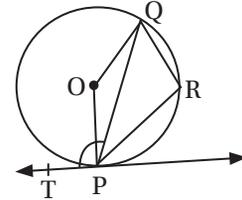
General Instructions:

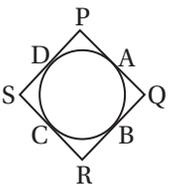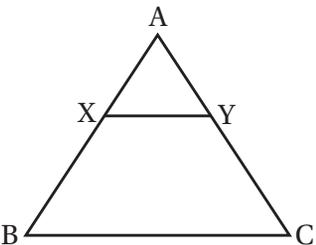**Read the following instructions carefully and follow them:**

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 questions 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 question of Section E.

9. Draw neat and clean figures wherever required. Take $\pi = \dfrac{22}{7}$ wherever required if not stated.

10. Use of calculators is not allowed.

SECTION A

Section A consists of 20 questions of 1 mark each.

1.	The graph of a quadratic polynomial p(x) passes through the points (–1, 2), (0, 1), (1, 2), (2, 5). The number of zeroes of the polynomial are Ⓐ 1 Ⓑ 2 Ⓒ 3 Ⓓ none of these	[1]
2.	The value of K for which the system of equations $3x – ky – 7 = 0$ and $6x + 10y – 3 = 0$ is inconsistent, is Ⓐ –10 Ⓑ –5 Ⓒ 5 Ⓓ 7	[1]
3.	Which of the following statements is not true? Ⓐ A number of secants can be drawn at any point on the circle Ⓑ Only one tangent can be drawn at any point on a circle Ⓒ A chord is a line segment joining two points on the circle Ⓓ From a point outside of a circle only one tangent can be drawn	[1]
4.	The fifth term of the sequence 2, 4, 6, ... is Ⓐ 3 Ⓑ 10 Ⓒ 8 Ⓓ 13	[1]
5.	The radius of the base of a right circular cone and the radius of a sphere are each 5 cm in length. If the volume of the cone and sphere is same and height of the cone is 5k cm, then find k. Ⓐ 5 Ⓑ 20 Ⓒ 10 Ⓓ 4	[1]
6.	If $\dfrac{1}{\sin\theta.\cos\theta} = m.\tan\theta + n.\cot\theta$. Then find the value of (m – n). Ⓐ –1 Ⓑ 0 Ⓒ 1 Ⓓ 2	[1]
7.	In the given figure, a tangent has been drawn at a point P on the circle centred at O. If $\angle TPQ = 110°$, then $\angle PRQ$ is equal to Ⓐ 110° Ⓑ 70° Ⓒ 40° Ⓓ 80°	[1]
8.	A quadratic polynomial having zero $\sqrt{5}$ is Ⓐ $x^2 – 5 = 0$ Ⓑ $x^2 + \sqrt{5} = 0$ Ⓒ $x^2 – 25 = 0$ Ⓓ $x^2 – \sqrt{5} = 0$	[1]
9.	Consider the frequency distribution of 45 observations.	[1]

Class	0–10	10–20	20–30	30–40	40–50
Frequency	5	9	15	10	6

The upper limit of modal class is

Ⓐ 20 Ⓑ 10 Ⓒ 30 Ⓓ 6

10.	In the given figure, if quadrilateral PQRS circumscribes a circle, then PD + QB =	[1]
	Ⓐ PQ Ⓑ QR Ⓒ PR Ⓓ PS	
11.	The roots of the quadratic equation $x^2 + x + 1 = 0$ are	[1]
	Ⓐ irrational and distinct Ⓑ not real	
	Ⓒ rational and distinct Ⓓ real and equal	
12.	If $\theta = 22\frac{1}{2}^{\circ}$, then the value of tan 2θ is	[1]
	Ⓐ 1 Ⓑ 4 Ⓒ 4 Ⓓ not defined	
13.	The total surface area of a solid hemisphere is $\frac{594}{7}$ cm^2, then the volume of the hemisphere (in cm^3) is	[1]
	Ⓐ $\frac{594}{7}$ Ⓑ $\frac{396}{7}$ Ⓒ $\frac{549}{7}$ Ⓓ $\frac{604}{7}$	
14.	A bag contains 100 balls numbered from 1 to 100. One ball is drawn at random. What is the probability that the number on the ball is a prime number?	[1]
	Ⓐ $\frac{1}{6}$ Ⓑ $\frac{1}{4}$ Ⓒ $\frac{11}{24}$ Ⓓ $\frac{5}{8}$	
15.	The point on the y-axis nearest to the point (–4, –5) is	[1]
	Ⓐ (0, 0) Ⓑ (–4, 0) Ⓒ (0, –5) Ⓓ $(0, \sqrt{41})$	
16.	In the figure, XY ‖ BC . AX : BX = 3 : 4 and AY : YC = (x + 1) : (x + 2) then find the value of x.	[1]
	Ⓐ 1 Ⓑ 2 Ⓒ 3 Ⓓ 4	
17.	A point on the line y = x which is the mid point of the line segment joining (4, 0) and (0, 4α). Then the value of α is	[1]
	Ⓐ 1 Ⓑ 2 Ⓒ 3 Ⓓ 4	
18.	A quadratic polynomial whose zeroes are $\frac{2}{5}$ and $\frac{-2}{5}$ is	[1]
	Ⓐ $25\,x^2 – 2$ Ⓑ $25\,x^2 – 4$ Ⓒ $25\,x^2 + 2x$ Ⓓ $25\,x^2 + 4x$	

Assertion Reason based Questions (19–20):

Directions: In the following questions, a statement of assertion (A) is followed by a statement of Reason (R). Choose the correct answer out of the following 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.

19.	**Assertion:** HCF of any two consecutive odd natural numbers is always 1. **Reason:** HCF × LCM = product of two given positive integers.	[1]
20.	**Assertion:** $\sqrt{2}\left(1+\dfrac{1}{\sqrt{2}}\right)$ is an irrational number. **Reason:** Product of two irrational number is always irrational.	[1]

SECTION B

Section B consists of 5 questions of 2 marks each.
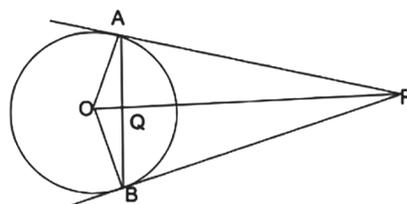
21.	(A) Find HCF and LCM of 360 and 1024 using prime factorisation method. **OR** (B) The HCF of 85 and 238 is expressible in the form $85 \times 3 + 238\,n$. Find the value of n.	[2]
22.	In two concentric circles, a chord of length 16 cm of the larger circle touches the smaller circle. If the radius of the larger circle is 10 cm, then find the radius of the smaller circle.	[2]
23.	Evaluate: $\dfrac{2\sin^2 60° - \tan^2 30°}{\sec^2 45°} + \sin^2 60° + \cos^2 60°$	[2]
24.	If $\tan(A-B) = \dfrac{1}{\sqrt{3}}$ and $\cot(A+B) = \dfrac{1}{\sqrt{3}}$, $0° < A+B < 90°$ and A > B, then find the values of A and B.	[2]
25.	If A(–5, 6), B(3, 0) and C(9, 8) are the vertices of a triangle ABC, then ΔABC is what type of triangle? Give reason for your answer.	[2]

SECTION C

Section C consists of 6 questions of 3 marks each

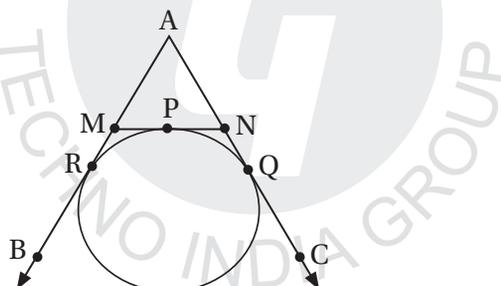|		
26.	Prove that $\sqrt{3}$ is an irrational number.	[3]
27.	The sum of two numbers is 5 and the sum of their reciprocals is $\dfrac{5}{6}$. Find the numbers.	[3]
28.	If $\tan\theta = \dfrac{12}{5}$, where $0 < \theta < 90°$, then find the value of $\dfrac{1+\sin\theta}{1-\sin\theta}$	[3]
29.	If $\cos\theta + \sin\theta = 1$, then find the value of $\dfrac{\cos^2\theta - \sin^2\theta}{\cos^2\theta + \sin^2\theta}$.	[3]

30.	(a) In the given figure, PA and PB are tangents to a circle centred at 0. Prove that	[3]
	(i) AOBP is a kite	
	(ii) AQ = QB	
	(iii) ∠AQP = 90°	
	OR	
	(b) Prove that pair of tangents drawn from an external point to a circle are equal.	[3]
31.	Prove that $\sqrt{5}$ is an irrational number.	[3]

SECTION D

Section D consists of 4 questions of 5 marks each

32.	(a) The sum of areas of two squares is 468 m². If difference of their perimeters is 24 m, then find the side length of both squares.	[5]
	OR	
	(b) ₹6500 were divided equally among a certain number of persons. Had there been 15 more persons, each would have got ₹30 less. Find the original number of persons.	[5]
33.	Prove that the lengths of tangents drawn from an external point to a circle are equal. Using the above result calculate the perimeter of ΔMAN if AR = 10 cm.	[5]
34.	The area of a segment of a circle of radius 28 cm and having central angle of 30° is $\frac{\alpha}{3}$ cm² then find α. Write the formula of perimeter of sector.	[5]
35.	(A) Find 2 mean – 3 median of the following data.	[5]

Class	85–90	90–95	95–100	100–105	105–110	110–115
Frequency	15	22	20	18	20	25

OR

(B) The monthly expenditure on milk in 200 families of a housing society is given below:

Monthly expenditure (in ₹)	1000-1500	1500-2000	2000-2500	2500-3000	3000-3500	3500-4000	4000-4500	4500-5000
Number of families	24	40	x	28	30	22	16	7

Find the value of x and also find the mean expenditure.

SECTION E

Section E consists of 3 questions of 4 marks each.

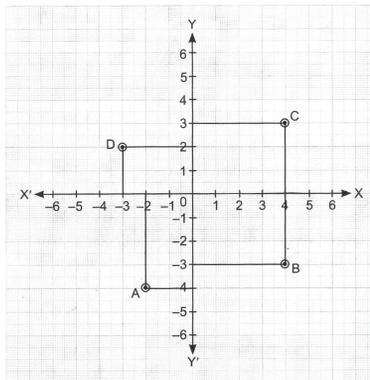|		
36.	Two friends Pradeep and Deepak are playing a game. Pradeep asks Deepak to think of a mathematical sequence which is as follows in increasing order: a, a + d, a + 2d, a + 3d .... The 10th term of the sequence is 109 and 15th term is 149. Based on the above information, answer the following questions: (i) What is 1st term of above sequence? (ii) What is the common difference, if the sequence forms an AP? (iii) (A) What is the sum of first 20 terms of the AP? **OR** (B) If the sequence has 25 terms, then what will be the sum of last 10 terms?	[1] [1] [2] [2]
37.	Aarav runs a medical store that offers home delivery to its customers. His store is located at point A as indicated in the map below. He receives more orders from locations B, C, and D. Using the given information answer the following questions: (i) What are the coordinates of medical store A? (ii) In which quadrants B, C and D lie? (iii) (A) Which location is nearby Aarav's medical store, B or D? **OR** (B) If the delivery boy walks from Aarav's medical store to D and then to C, then find total distance travelled by him.	[1] [1] [2] [2]

38.	During heavy flood, a person got trapped in a building 15 m above the water level. Information about this was given by a boat of the rescue team to a helicopter carrying the rescue team. The angle of elevation of top of the building from boat is 30°. The helicopter rescues the person with the help of a rope by lifting him towards the boat. During this time the angle of elevation of the person from the boat becomes 45° at a particular instant and angle of elevation of the helicopter becomes 60° from the boat. At the same time, the image of the person in the water makes an angle of depression of 60° with the boat.
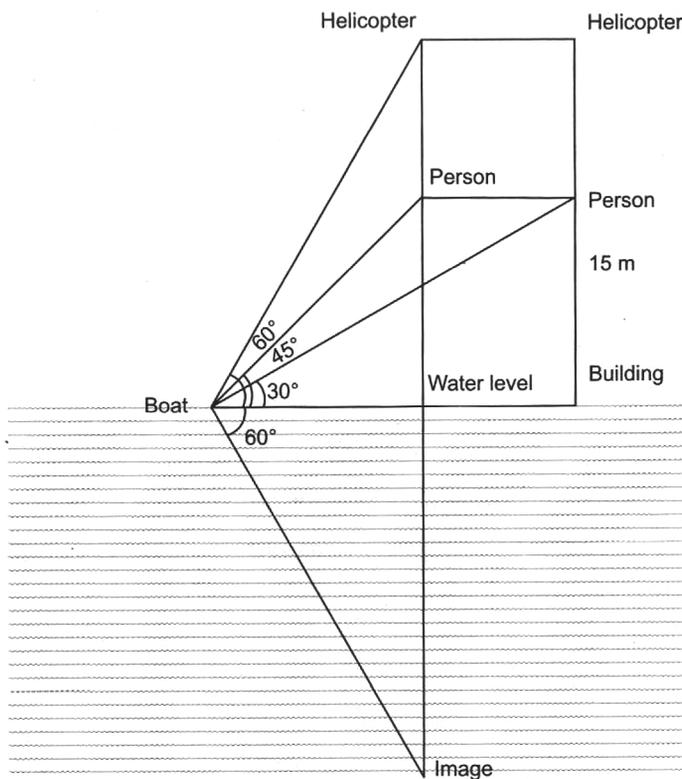
Now answer the following:

(i)   Find height of helicopter from water level. [1]

(ii) Find the length of rope by which the person is rescued. [1]

(iii) (A) Find the distance between the person and his image formed in water. [2]

OR

(B) If the helicopter takes 5 seconds to reach at the particular instant from the top of the building then what will be the speed of the helicopter? [2]