

MODEL QUESTION PAPER
SUMMATIVE ASSESSMENT – TERM II 2025-26
MATHEMATICS (EM) Class : X Time : 2½ Hours Total Score : 80

Instructions

- Use the first 15 minutes to read the questions and think about the answers.
- There are 26 questions, split into 4 parts A, B, C, D.
- Answer all questions; but in questions of the type “A or B”, you need answer only one of those.
- You can answer the questions in any order, writing the correct question number.
- Answers must be explained, whenever necessary.
- No need to simplify irrationals like $\sqrt{2}$, $\sqrt{3}$, etc. using approximations unless you are asked to do so.

Section A

1. The point $(-3, 2)$ belongs to
A) I quadrant
B) II quadrant
C) III quadrant
D) IV quadrant (Score 1)
2. What is the distance of the point $(5, 12)$ from the origin? (5, 12, 13, 17)
(Score 1)
3. A) Write the coordinates of all the vertices of a rectangle with sides parallel to the axes, one vertex at $(2, 3)$, length 6 units and breadth 4 units.
OR
B) Write the coordinates of the three vertices of an equilateral triangle with side 6 units, one vertex at $(0, 0)$ and the base parallel to the x-axis. (Score 3)
4. The points $A(2, 3)$, $B(6, 3)$ and $C(4, 3 + 2\sqrt{3})$ are given.
(i) Find the length of AB.
(ii) Prove that triangle ABC is equilateral. (iii) Find the coordinates of the circumcentre of $\triangle ABC$. (Score 4)
5. A) The coordinates of the vertices of $\triangle ABC$ are $A(1, 2)$, $B(4, 6)$ and $C(7, 2)$.
(i) Find the length of BC.
(ii) Find the coordinates of the midpoint of BC.
(iii) Find the equation of the median from A.

OR
B) The points $P(-1, 5)$, $Q(3, 1)$ and $R(9, 5)$ are given.
(i) Find the coordinates of the midpoint of PQ.
(ii) Find the coordinates of the centroid of $\triangle PQR$.
(iii) Find the coordinates of the point which divides the line segment PR in the ratio 2 : 1 internally. (Score 4)
6. The vertices of $\triangle ABC$ are $A(-2, 3)$, $B(4, 5)$ and $C(6, -1)$.
(i) Find the midpoint of BC.

- (ii) Find the equation of the perpendicular bisector of BC.
- (iii) Find the circumradius of $\triangle ABC$. (Score 5)

Section B

7. The point $(0, -5)$ lies on the graph of a second degree polynomial. If $p(1) = -2$ and $p(-1) = 10$, find the polynomial. (Score 3)
8. The graph of a second degree polynomial passes through the points $(0, 5)$, $(1, 3)$ and $(-2, 15)$. Write the polynomial in the form $p(x) = ax^2 + bx + c$. (Score 3)
9. Prove that the points $A(1, 7)$, $B(4, 2)$, $C(-1, -1)$ and $D(-4, 4)$ are the vertices of a rectangle. (Score 4)
10. The coordinates of the vertices of $\triangle ABC$ are $A(0, 0)$, $B(6, 0)$ and $C(3, 3\sqrt{3})$.
 - (i) Find the equation of side BC.
 - (ii) Find the equation of the altitude from A to BC.
 - (iii) Find the area of $\triangle ABC$. (Score 4)
11. The sum of the first n terms of a sequence is $n^2 + 3n$.
 - (i) Write the first term and the common difference.
 - (ii) Write the algebraic form of the sequence.
 - (iii) Is 190 a term of this sequence? Why? (Score 4)
12. A) The distance between the points $(3, k)$ and $(k, 7)$ is 5 units. Form a second degree equation and find the possible values of k .
 OR B) The midpoint of the line segment joining $(2, -3)$ and $(6, k)$ lies on the x -axis. Form a second degree equation and find k . (Score 4)

Section C

13. Consider the second degree equation $x^2 - (p+3)x + 2p = 0$.
 - (i) Write the sum and product of the roots.
 - (ii) If one root is twice the other, find p .
 - (iii) Find the roots. (Score 5)
14. A) Draw the graph of $y = x^2 - 5x + 6$ and write
 - (i) the coordinates of the vertex
 - (ii) the equation of the axis of symmetry
 - (iii) the roots
 OR B) Draw the graph of $y = 2x^2 - 4x - 2$ and answer the questions as above. (Score 5)

Section D

15. A) A point moves such that its distance from the point $(4, 0)$ is always twice its distance from the point $(-2, 0)$. Write the equation of the locus.
 OR
 B) Write the equation of the circle with centre $(-1, 2)$ and radius 5. Find the points of intersection of this circle with the x -axis. (Score 4)
16. Find the equation of the circle passing through the points $(1, 0)$, $(0, 1)$ and $(-1, 0)$. (Score 4)
17. The end points of a diameter of a circle are $(-3, 4)$ and $(5, -4)$.
 - (i) Find the centre and radius of the circle.

- (ii) Write the equation of the circle. (iii) Find the equation of the tangent at the point (1, 0) on this circle. (Score 5)
18. Find the equation of the circle with centre (2, -3) which touches the x-axis. Find also the points of contact. (Score 4)
19. The points A(1, 2), B(5, 5) and C(8, 1) are given.
(i) Find the equation of the perpendicular bisector of AB.
(ii) Find the equation of the perpendicular bisector of BC.
(iii) Find the circumcentre and circumradius of $\triangle ABC$. (Score 5)
20. Draw the graph of the second degree polynomials $y = x^2 - 4x + 3$ and $y = -x^2 + 4x - 1$ on the same graph sheet.
(i) Find the points of intersection of the two graphs.
(ii) Find the area enclosed between the two graphs. (Score 5)
21. Construct $\triangle ABC$ such that $AB = 6$ cm, $BC = 7$ cm and circumradius = 4 cm. (Score 5)