SECOND TERM EVALUATION 2024-25

MATHEMATICS MODEL QUESTION PAPER
Standard: IX

Time: 2.5 Hours
Score: 80

Part 1: Short Answer Questions (2 Marks Each)

Answer any 3 questions from 1 to 4.

1. Two triangles have equal angles. The ratio of one pair of corresponding sides is 3:4
   a) What is the scale factor of the smaller triangle to the larger one?
   b) If the perimeter of the smaller triangle is 24 cm, find the perimeter of the larger triangle.

2. A rectangle is inscribed in a circle.
   a) Find the length of the diagonal of the rectangle if its sides are 8cm and 6cm.
   b) Calculate the circumference of the circle.

3. A circular park has a diameter of 28m.
   a) Find the radius of the park.
   b) Calculate the area of the park.

4. The sum of two numbers is 10, and their product is 24. Find the numbers.

Part 2: Medium-Length Questions (3 Marks Each)

Answer any 4 questions from 5 to 10.

5. In two triangles, the corresponding angles are equal, and one pair of sides is in the ratio 5:3
   a) If the perimeter of the smaller triangle is 24cm, find the perimeter of the larger triangle.
   b) Prove that the triangles are similar.

6. Three circles have radii in the ratio 2:3:4.
   a) What is the ratio of their diameters?
   b) If the area of the smallest circle is $12.56 cm^2$, find the area of the largest circle.

7. The distance between two points on a number line is 9.
   a) Write this as an equation.
   b) Solve for the two points if one point is 3.

8. A rectangle has one side 5cm longer than the other.
   a) Write an expression for the perimeter in terms of the smaller side x.
   b) If x=10cm, calculate the area of the rectangle.

9. A circular bracelet is divided into four equal arcs.
   a) What is the central angle of one arc?
   b) Calculate the length of one arc if the radius of the bracelet is 7cm.

10. A right triangle has a hypotenuse of 13cm and one leg of 12cm.
    a) Find the length of the other leg.
    b) Calculate the area of the triangle.

Part 3: Long Answer Questions (4 Marks Each)

Answer any 8 questions from 11 to 21.

11. The sides of a triangle are 3:4:5. If its perimeter is 36cm, find the area of the triangle.

12. The diagonals of a square intersect at 90°.
    a) If the side of the square is 8cm, calculate the length of each diagonal.
    b) Find the area of the square.

13. A polynomial $p(x)=x^3-6x^2+11x-6$
    a) Find the value of p(2)
    b) Prove x−2 is a factor of p(x).

14. Two sectors of a circle have the same radius but different angles.
    a) If the radius is 10cm and the angles are 60° and 90°, calculate the area of both sectors.
    b) Find the ratio of the areas of the two sectors.

15. Draw a triangle with sides 6cm,8cm, and 10cm. Construct another triangle with a scale factor of 3/2.

16. The product of two consecutive even numbers is 48. Find the numbers.

17. A side of an equilateral triangle is 8cm.
    a) Find its height.
    b) Calculate its area.

18. Two similar triangles have a side ratio of 2:3.
    a) If the area of the smaller triangle is $16cm^2$, find the area of the larger triangle.
    b) Calculate the perimeter of the larger triangle if the smaller one has a perimeter of 24cm.

19. A semicircle of radius 7cm is drawn.
    a) Find the perimeter of the semicircle.
    b) Calculate its area.

20. Solve the equation |x−4|=7 and interpret the solution on a number line.

21. If $f(x) = x^2 - 3x + 2$, find $f(2)$, $f(-1)$, and $f(0)$.

Part 4: Extended Questions (5 Marks Each)

Answer any 6 questions from 22 to 29.d

22. A rectangle has sides 8 cm 6 cm. A diagonal divides it into two triangles.
    a) Find the length of the diagonal.
    b) Calculate the area of one triangle.

23. Two concentric circles have radii 7cm and 14 cm.
    a) Find the area of the annular region.
    b) If a third circle divides this region equally, find its radius.

24. A polynomial $q(x) = 3x^3 - 5x^2 + x - 2$.
    a) Find $q(1)$ and $q(-1)$.
    b) Write the remainder when $q(x)$ is divided by $x - 1$.

25. A circular disc of radius 14cm is divided into 8 equal sectors.
    a) Find the area of one sector.
    b) Calculate the total area of the shaded sectors if 5 of them are shaded.

26. Construct a triangle with sides in the ratio 3:4:5 and a perimeter of 36cm.

27. Four circles with radius 2cm are drawn at the corners of a rectangle.
    a) Find the area of the shaded regions if the rectangle is 10cm×6cm.
    b) Calculate the area of the unshaded portion.

28. A pattern of squares has sides 4cm, 6cm, 8cm, and so on.
    a) Write an expression for the perimeter of the n-th square.
    b) Find the perimeter of the 5-th square.

29. A circle is inscribed in a triangle with sides 8cm,6cm, and 10 cm.
    a) Find the radius of the inscribed circle.
    b) Calculate its area.