



**Octahedron institute, chandan nagar**

**office no 2, 1st floor chandan complex**

**Class 10 - Mathematics**

**COORDINATE GEOMETRY**

**Maximum Marks: 90**

**Time Allowed: 2 hours**

**General Instructions:**

**ANSWER ALL QUESTIONS**

**Section A**

1. Determine if the points (1, 5), (2, 3) and (-2, -11) collinear. 2
2. Find the distance between the points (0, 0) and (36, 15). Also, find the distance between towns A and B if town B is located at 36 km east and 15 km north of town A. 2
3. Find the area of the triangle whose vertices are: (2, 3), (-1, 0), (2, -4) 2
4. If the point (x, y) is equidistant from the points (a + b, b - a) and (a - b, a + b), prove that  $bx = ay$  2
5. Prove that the points (0, 0), (5, 5) and (-5, 5) are the vertices of a right isosceles triangle. 2
6. If A (-3, 2), B(p, q) and C(-1, 4) are the vertices of an isosceles triangle, show that  $P + Q = 1$ , if  $AB = BC$ . 2
7. Find the distance between the points (0, 0) and (36, 15). 2
8. A(3, 2) and B(-2, 1) are two vertices of a triangle ABC, whose centroid G has a coordinates  $\left(\frac{5}{3}, -\frac{1}{3}\right)$ . Find the co-ordinates of the third vertex C of the triangle. 2
9. Find the value of y for which the distance between the points P (2, -3) and Q(10, y) is 10 units. 2
10. Let A  $\rightarrow$  (4, 2), B  $\rightarrow$  (6, 5) and C  $\rightarrow$  (1, 4) be the vertices of triangle ABC. The median from A meets BC at D. Find the coordinates of the point D. 2
11. Find the area of a rhombus if its vertices are (3, 0), (4, 5), (-1, 4) and (-2, -1) taken in order. 2
12. Find the ratio in which the segment joining the points (-3, 10) and (6, -8) is divided by (-1, 6). 2
13. Find the area of the quadrilateral whose vertices, taken in order, are (-4, -2), (-3, - 2

- 5), (3,-2) and (2, 3).
14. If two vertices of an equilateral triangle are (0, 0) and  $(3, \sqrt{3})$ . Find the third vertex. 2
  15. The three vertices of a parallelogram, ABCD taken in order are (2, -1), B(3, 4) and C(-2, 3). Find the coordinates of the fourth vertex. 2
  16. Find the area of the triangle formed by joining the mid-points of the sides of the triangle whose vertices are (0, -1), (2, 1) and (0, 3). Find the ratio of this area to the area of the given triangle. 2
  17. The line joining the points (2, 1) and (5, -8) is trisected at the points P and Q. If point P lies on the line  $2x - y + K = 0$ . Find the value of K. 2
  18. The coordinates of the vertices of  $\triangle ABC$  are A(4, 1), B(-3, 2) and C(0, K). Given that the area of  $\triangle ABC$  is 12, find the value of K. 2
  19. Prove that diagonals of a rectangle bisect each other and are equal. 2
  20. Find the value of p for which the points (-5, 1), (1, p) and (4, -2) are collinear. 2
  21. Determine the ratio in which the line  $2x + y - 4 = 0$  divides the line segment joining the points A (2, -2) and B (3, 7). 2
  22. Find the lengths of the medians of the triangle whose vertices are (1, -1), (0, 4) and (-5, 3). 2
  23. ABCD is a rectangle formed by joining points A (-1, -1), B (-1, 4), C(5, 4) and D(5, -1). P, Q, R and S are the mid-points of AB, BC, CD and DA respectively. Is the quadrilateral PQRS a square? Or a rhombus? Justify your answer. 2
  24. If, Q (0, 1) is equidistant from P (5, -3) and R (x, 6), find the values of x. Also, find the distances QR and PR. 2
  25. Find the area of the quadrilateral whose vertices taken in order are (-4, -2), (-3, -5), (3, -2) and (2, 3). 2
  26. Show that the points A(2, -2), B (14, 10), C(11, 13) and D(-1, 1) are the vertices of a rectangle. 4
  27. Find the centre of a circle passing through the points (6, -6), (3, -7) and (3, 3). 4
  28. Find the coordinates of the points which divide the line segment joining A(-2, 2) and B(2, 8) into four equal parts. 4
  29. The vertices of  $\triangle ABC$  are A(4, 6), B(1, 5) and C(7, 2). A line is drawn to intersect sides AB and AC at D and E respectively such that  $\frac{AD}{AB} = \frac{AE}{AC} = \frac{1}{4}$ . Calculate the 4

area of the  $\triangle ADE$  and compare it with the area of  $\triangle ABC$ .

30. ABCD is a rectangle formed by the points A(-1, - 1), B(- 1, 4), C(5, 4) and D(5, - 1). P, Q, R and S are the mid-points of AB, BC, CD and DA respectively. Is the quadrilateral PQRS a square? a rectangle? or a rhombus? Justify your answer. 4
31. Find the coordinates of the point which divide the line segment joining A(2, - 3) and B(- 4, - 6) into three equal parts. 4
32. Find the circumcentre of the triangle, whose vertices are (-2, -3), (-1, 0) and (7, -6). 4
33. Name the type of quadrilateral formed, if any, by the following points, and give reasons for your answer: 4
- (-1, -2), (1, 0), (-1, 2), (-3, 0)
34. The two opposite vertices of a square are (-1, 2) and (3, 2). Find the coordinates of the other two vertices. 4
35. Find the vertices of the triangle, the mid-points of whose sides are (3, 1) (5, 6) and (- 3, 2). 4