

**SUBJECT: MATHEMATICS**

**MAX. MARKS : 40**

**CLASS : IX**

**DURATION : 1½ hrs**

**General Instructions:**

- (i). All questions are compulsory.
- (ii). This question paper contains **20** questions divided into five Sections A, B, C, D and E.
- (iii). **Section A** comprises of **10 MCQs** of **1 mark** each. **Section B** comprises of 4 questions of **2 marks** each. **Section C** comprises of 3 questions of **3 marks** each. **Section D** comprises of 1 question of **5 marks** each and **Section E** comprises of 2 Case Study Based Questions of **4 marks** each.
- (iv). There is no overall choice.
- (v). Use of Calculators is not permitted

**SECTION – A**

**Questions 1 to 10 carry 1 mark each.**

1. Which of the following points does not lie in III quadrant ?  
(a)  $(-1, 2)$       (b)  $(-2, -5)$       (c)  $(-1, -2)$       (d)  $(-6, -3)$   
Ans: (a)  $(-1, 2)$
2. Perpendicular distance of the point  $P(-3, 8)$  from y-axis is  
(a)  $-3$       (b)  $8$       (c)  $3$       (d)  $-8$   
Ans: (c)  $3$
3. If points  $P(5, 1)$ ,  $Q(0, 2)$ ,  $R(3, 0)$ ,  $S(-1, 0)$  are plotted on a graph paper, then the points on y-axis are  
(a) only P      (b) only Q      (c) Q and R      (d) R and S  
Ans: (b) only Q
4. If  $P(-1, 1)$ ,  $Q(3, -4)$ ,  $R(1, -1)$ ,  $S(-2, -3)$  and  $T(-4, 4)$  are plotted on the graph paper, then the point(s) in the fourth quadrant are  
(a) P and T      (b) Q and R      (c) Only S      (d) P and R  
Ans: (b) Q and R
5. The points  $(2, -1)$ ,  $(6, -5)$  and  $(-3, -2)$   
(a) lie in the I quadrant.      (b) lie in the II quadrant.  
(c) lie in the IV quadrant.      (d) do not lie in the same quadrant.  
Ans: (d) do not lie in the same quadrant.  
Points  $(2, -1)$  and  $(6, -5)$  lie in the fourth quadrant. But the point  $(-3, -2)$  lie in the third quadrant. Thus, the given points do not lie in the same quadrant.
6. Ordinate of all the points on the x-axis is  
(a) 0      (b) 1      (c)  $-1$       (d) any number  
Ans (a) 0
7. The point  $(0, 5)$  lies  
(a) on the x-axis      (b) on the y-axis      (c) in the II quadrant      (d) in the I quadrant  
Ans: (b) on the y-axis
8. If the coordinates of the two points are  $P(-5, 3)$  and  $Q(8, -9)$ , then (abscissa of Q) – (abscissa of P) is

Ans: (c) 13

$$(\text{abscissa of } Q) - (\text{abscissa of } P) = 8 - (-5) = 8 + 5 = 13$$

**In the following questions 9 and 10, a statement of assertion (A) is followed by a statement of Reason (R). Choose the correct answer out of the following choices.**

- (a) Both A and R are true and R is the correct explanation of A.
  - (b) Both A and R are true but R is not the correct explanation of A.
  - (c) A is true but R is false.
  - (d) A is false but R is true.

**9. Assertion (A):** The points A(2, 3) and B(2, -4), both lie on the line parallel to y-axis.

**Reason (R):** The point A(2, 3) lies in the first quadrant.

Ans: (b) Both A and R are true but R is not the correct explanation of A.

**10. Assertion (A):** The points A(6, - 4) lies in quadrant IV.

**Reason (R):** The signs of points in quadrants I, II, III and IV are respectively  $(+, +)$ ,  $(-, +)$ ,  $(-, -)$  and  $(+, -)$ .

Ans: (a) Both A and R are true and R is the correct explanation of A.

## **SECTION – B**

**Questions 11 to 14 carry 2 marks each.**

**11.** In which quadrant, will the point lies, if

- (i) the ordinate is 2 and the abscissa is  $-3$   
 (ii) the abscissa is  $-4$  and the ordinate is  $-2$   
 (iii) the ordinate is  $-3$  and the abscissa is  $4$   
 (iv) the ordinate is  $3$  and the abscissa is  $-2$

Ans: (i) Here, abscissa is negative and ordinate is positive, so the point is  $(-3, 2)$ . Hence it lies in IIInd quadrant.

(ii) Here, abscissa and ordinate both are negative, the point is  $(-4, -2)$ , which lies in IIIrd quadrant.

(iii) Here, abscissa is positive and ordinate is negative. Therefore, the point  $(4, -3)$  lies in IVth quadrant.

(iv) Here, abscissa is negative and ordinate is positive. Therefore, the point  $(-2, 3)$  lies in IIInd quadrant.

**Ans:** Distance of the point from the  $y$ -axis is the  $x$ -coordinate of the given point. So, the distances of the points from the  $y$ -axis are as follows:

Ans. Distance of the point from the y-axis is the x-coordinate of the given point. So, the distances of points P, Q, R and S from the y-axis are 3 units, 0 unit, 22 units and 3 units respectively.

13. Find the coordinates of a point:  
 (i) whose ordinate is 6 and lies

- (i) whose ordinate is 6 and lies on the  $y$ -axis  
(ii) whose abscissa is  $-3$  and lies on the  $x$ -axis.

Ans: For the point  $(x, y)$ ,  $x$  represents abscissa and  $y$  represents ordinate. Hence, (i) The ordinate of a point does not depend on the position of the point.

(1) The coordinates of a point whose abscissa is zero lies on the y-axis. The first coordinate is (0, 6).

(ii) The coordinates of point 1

(ii) The coordinates of a point whose ordinate is zero and lies on the  $x$ -axis. Therefore, required coordinates =  $(-3, 0)$

**14.** In which quadrant the following points lie?  
(2, -3), (-2, -3), (-1, 4), (-1, -1), (1, -2), (2, 3)

- (3, 2), (2, -3), (-4, 4) and (-2, -3)

Ans: Point (3, 2) lies in Ist quadrant

Point  $(2, -3)$  lies in IVth quadrant

Point  $(-4, 4)$  lies in IIInd quadrant

Point  $(-2, -3)$  lies in IIIrd quadrant

## **SECTION – C**

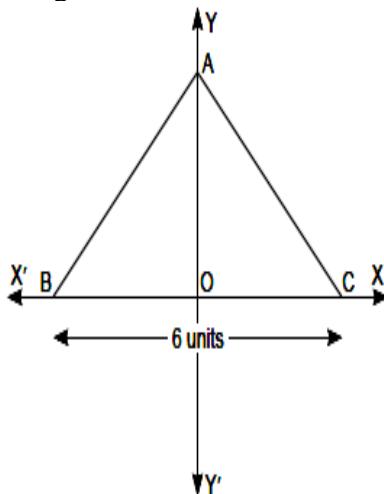
**Questions 15 to 17 carry 3 marks each.**

**15.** Write the coordinates of the following points:

- lying on neither axes at a distance of 3 units from the  $x$ -axis and 5 units from the  $y$ -axis.
- lying on  $y$ -axis with the  $y$ -coordinate  $(-3)$ .
- lying on the  $x$ -axis with  $x$ -coordinate 4.

Ans: (i)  $(5, 3)$  (ii)  $(0, -3)$  (iii)  $(4, 0)$

**16.** Point A is chosen on  $y$ -axis in such a way that  $\Delta ABC$  is an equilateral triangle. The base BC of the  $\Delta ABC$  is shown in the figure. Find the coordinates of (i) the mid-point of BC (ii) the area of the triangle (iii) the vertices of a triangle.



Ans: (i) O is the mid-point of BC, but lies at the intersecting point of the coordinates axes. Hence, coordinates of mid-point of BC is  $(0, 0)$ .

(ii) Given  $\Delta ABC$  is an equilateral triangle.

$$\therefore AB = BC = CA = 6 \text{ units}$$

O is the perpendicular bisector of BC

$$\therefore OB = \frac{1}{2} BC = \frac{1}{2} \times 6 = 3 \text{ units}$$

Using Pythagoras theorem, in right-angled  $\Delta AOB$  with  $\angle O = 90^\circ$ , we have

$$AB^2 = OB^2 + AO^2$$

$$\Rightarrow AO^2 = AB^2 - OB^2 = 6^2 - 3^2 = 36 - 9 = 27$$

$$\therefore AO = \sqrt{27} = 3\sqrt{3} \text{ units}$$

$$\text{So, area of } \Delta ABC = \frac{1}{2} \times \text{Base} \times \text{Altitude} = \frac{1}{2} \times BC \times AO = \frac{1}{2} \times 6 \times 3\sqrt{3} = 9\sqrt{3} \text{ sq. units}$$

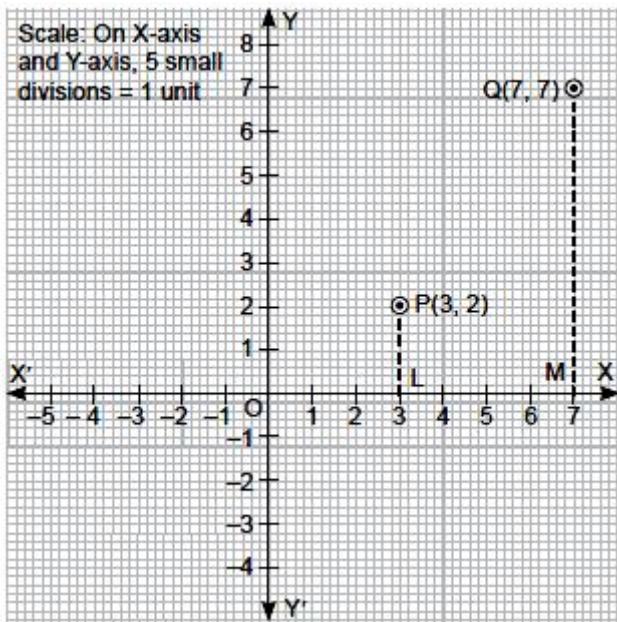
(iii) The coordinates of vertices of  $\Delta ABC$  are  $A(0, 3\sqrt{3})$ ,  $B(-3, 0)$  and  $C(3, 0)$ .

**17.** P(3, 2) and Q(7, 7) are two points. Perpendiculars are drawn to the  $x$ -axis from P and Q meeting the  $x$ -axis at L and M respectively. Show working on graph.

(i) Find the coordinates of L and M.

(ii) Find the lengths of LM.

Ans:



It is clear that L and M lies on the  $x$ -axis.

(i)  $\therefore$  Coordinates of L are  $(3, 0)$

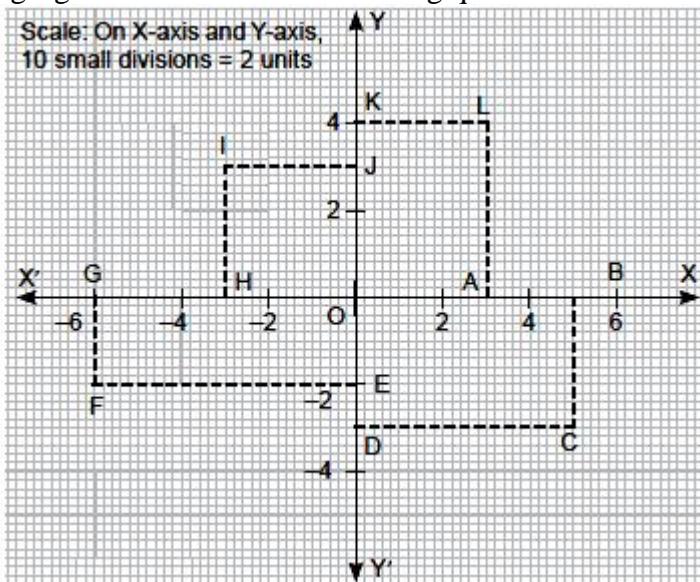
Coordinates of M are  $(7, 0)$

(ii) Length of LM =  $7 - 3 = 4$  units

### SECTION – D

Questions 18 carry 5 marks each.

18. Consider the following figure and answer the following questions:



(i) Find the coordinates of point F and C. (1)

(ii) Find the abscissa of point I. (1)

(iii) Find the coordinates of all the points G, H, A and B. (1)

(iv) Find the area of rectangle IJOH. (1)

(v) Find the distance BL. (1)

Ans: (i) Coordinates of point F and C are  $(-6, -2)$  and  $(5, -3)$  respectively.

(ii) Abscissa of point I is  $(-3)$ .

(iii) Coordinates of G( $-6, 0$ ), H( $-3, 0$ ), A( $3, 0$ ) and B( $6, 0$ ).

(iv) Area of rectangle IJOH =  $OH \times OJ = 3 \text{ units} \times 3 \text{ units} = 9 \text{ sq units}$

(v) In  $\Delta LBA$ , By Pythagoras theorem, we have  $BL^2 = BA^2 + AL^2$

$$\Rightarrow BL^2 = 3^2 + 4^2 = 9 + 16 = 25$$

$$\Rightarrow BL = 5 \text{ units.}$$

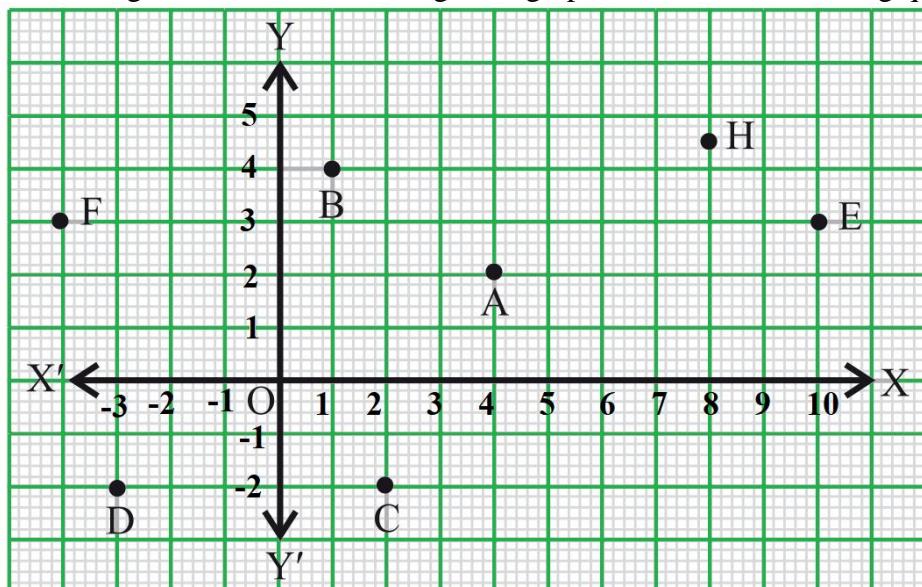
## **SECTION – E (Case Study Based Questions)**

**Questions 19 to 20 carry 4 marks each.**

- 19.** Students of class IX are on visit of Sansad Bhawan. Teacher assign them the activity to observe and take some pictures to analyses the seating arrangement between various MP and speaker based on coordinate geometry. The staff tour guide explained various facts related to Math's of Sansad Bhawan to the students, students were surprised when teacher ask them you need to apply coordinate geometry on the seating arrangement of MP's and speaker.



Calculate the following refer to the below image and graph. Answer the following questions :



- What are the coordinates of position 'F'? (1)
- What are the coordinates of position 'D'? (1)
- In which quadrant, the point 'C' lie? (1)
- Find the perpendicular distance of the point E from the y-axis. (1)

Ans: (i) (-4, 3)

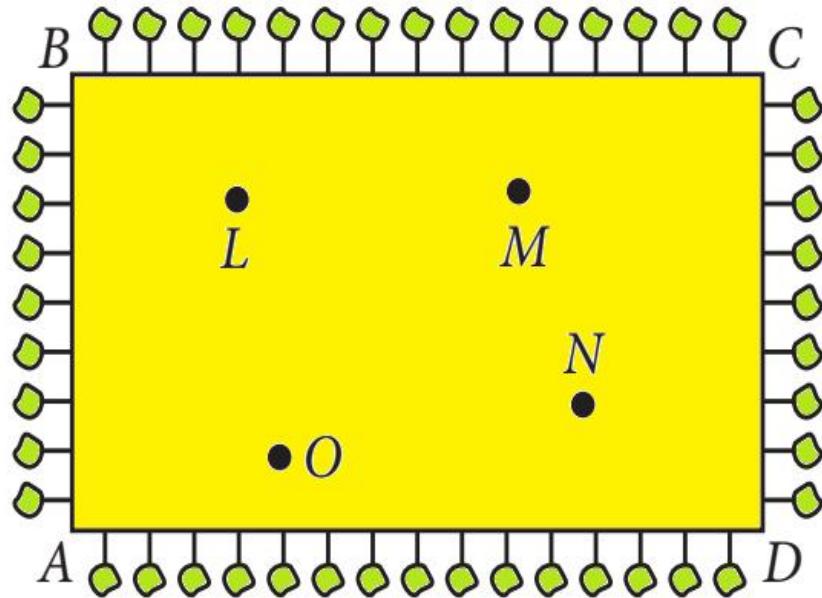
(ii) (-3, -2)

(iii) IV quadrant

(iv) 10 units

- 20.** On the occasions of 'Diwali' a rectangular plot have been allotted for 'Diwali Mela' to students of secondary school in Hyderabad. In order to reduce smog and pollution they decided to keep little

leaf linden plant on the boundary at a distance of 1 m from each other. Four air purifier machines have also been set up at points L, M, N, O. (Answer the following questions considering A as origin).



- (a) What are the coordinates of L? (1 mark)  
(b) What are the coordinates of N? (1 mark)  
(c) Find the distance between L and N (2 marks)

Ans: (a) (4, 7)

(b) (12, 3)

(c) By Pythagoras theorem,

$$LN^2 = AL^2 + AN^2$$

$$\Rightarrow LN^2 = 4^2 + 8^2 = 16 + 64$$

$$\Rightarrow LN^2 = 80$$

$$\Rightarrow LN = 4\sqrt{5} \text{ units}$$