THE O.P. GUPTA
ADVANCED MATH CLASSES
Mathematics (Standard & Basic)
Topic - Coordinate Geometry

RTS-07

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RANKERS
TEST SERIES FOR X

Max. Marks - 40
Time - 90 Minutes

SECTION A

*Followings multiple choice questions are of **1 Mark** each (Q01-10).*
Select the correct option in each one of them.

Q01. P is a point on x-axis at a distance of 3 units from y-axis to its right, the coordinate of P are

(A) $(3, 0)$ (B) $(0, 3)$ (C) $(3, 3)$ (D) $(-3, 3)$

Q02. If $C(-1, 1)$ is the midpoint of the line segment joining $A(-3, b)$ and $B(1, b+4)$, then value of b is

(A) 1 (B) 9 (C) 3 (D) -1

Q03. If the distance of $Q(x, y)$ from $R(5, 1)$ and $S(-1, 5)$ is same, then which of the following is true?

(A) $3x = 4y$ (b) $x = 2y$ (c) $3x = 2y$ (d) $x = 3y$

Q04. Find the ratio in which the line $2x + y - 4 = 0$ divides the line segment joining the points $A(2, -2)$ and $B(3, 7)$.

(A) $5:2$ (B) $2:7$ (C) $7:2$ (D) None of these

Q05. The perimeter of a triangle with vertices $(0, 4)$, $(0, 0)$ and $(3, 0)$ is

(A) 7 (B) 11 (C) 15 (D) 12

Q06. The distance between the points $A(2, -3)$ and $B(2, 2)$ is

(A) 2 units (B) 3 units (C) 4 units (D) 5 units

Q07. The point $P(1, 2)$ divides the join of $A(-2, 1)$ and $B(7, 4)$ in the ratio

(A) $1:2$ (B) $2:1$ (C) $3:2$ (D) $2:3$

Q08. The distance of the point $A(4, -3)$ from origin is

(A) 1 unit (B) 7 units (C) 5 units (D) 3 units

*Followings are **Assertion-Reason based questions** (Q09 & 10).*
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 **A** and **R** are true and **R** is the correct explanation of **A**.
(B) Both **A** and **R** are true and **R** is not the correct explanation of **A**.
(C) **A** is true but **R** is false.
(D) **A** is false but **R** is true.

Q09. **Assertion (A) :** If three vertices of a parallelogram taken in order are $(-1, -6)$, $(2, -5)$ and $(7, 2)$, then its fourth vertex is $(4, 1)$.

Reason (R) : Diagonals of parallelogram bisect each other.

Q10. **Assertion (A) :** The points $(5, -2)$, $(6, 4)$ and $(7, -2)$ are the vertices of an isosceles triangle.

Reason (R) : The points $(1, 5)$, $(2, 3)$ and $(-2, -11)$ are collinear.

$[1 \times 10 = 10$

SECTION B

*Followings are of **2 Marks** each (Q11-12).*

Q11. Find a point on y-axis equidistant from $(-5, -2)$ and $(3, 2)$.

Q12. (a) The centre of a circle is at $(2x - 1, 3x + 1)$ and radius is 10 units. Find the value of x, if the circle passes through the point $(-3, -1)$.

OR

(b) If two vertices of an equilateral triangle be $(0, 0)$ and $(3, \sqrt{3})$, find the coordinates of third vertex.

$[2 \times 2 = 4$

SECTION C

*Followings are of **3 Marks** each (Q13-16).*

Q13. The two opposite vertices of a square are given to be $(-1, 2)$ and $(3, 2)$. Find the coordinates of other two vertices.

Q14. (a) Find the coordinates of the point which divide the line segment joining $A(-2, 2)$ and $B(2, 8)$ into four equal parts.

OR

(b) If $P(x, y)$ is any point on the line segment joining the points A(a, 0) and B(0, b), then show that $\frac{x}{a} + \frac{y}{b} = 1$.

Q15. The line joining the points $(2, 1)$ and $(5, 8)$ is trisected by the points P and Q. If the point P lies on the line $2x - y + k = 0$, find the value of k.

Q16. If the coordinates of the mid-points of the sides of a triangle are (1, 1), (2, –3) and (3, 4), then find its centroid.

$[3 \times 4 = 12$

SECTION D

*Followings are of **5 Marks** each (Q17-18).*

Q17. (a) If C is a point lying on the line segment AB joining $A(1, 1)$ and $B(2, 3)$ such that $3AC = BC$, then find the coordinates of C.

OR

(b) If P and Q are two points whose coordinates are $(at^2, 2at)$ and $\left(\frac{a}{t^2}, \frac{2a}{t}\right)$ respectively and S is the point $(a, 0)$, then show that $\frac{1}{SP} + \frac{1}{SQ}$ is independent of t.

Q18. Find the centre of a circle passing through the points $(6, -6)$, $(3, -7)$ and $(3, 3)$.

$[5 \times 2 = 10$

SECTION E

*Following is a case-study based question of **4 Marks** (Q19); having three sub-parts (i), (ii) and (iii).*

Q19. Three friends Anu, Bina and Chiku are sitting in a triangular park. The respective positions of the three are mapped on a coordinate plane as:

- Anu at $A(4, 2)$,
- Bina at $B(6, 5)$,
- Chiku at $C(1, 4)$.

Based on the information provided above, answer the following questions.

(i) A straight path is drawn from Anu to the middle of the line joining Bina and Chiku. This path intersects side BC at point D. Find the coordinates of D.

(ii) On this path AD, a lamp post is to be installed at a point P such that $AP : PD = 2 : 1$. Find the coordinates of P.

(iii) (a) Walking paths are drawn from Bina to the mid-point of AC (point E) and from Chiku to the mid-point of AB (point F).

- On BE, another lamp post Q is installed such that $BQ : QE = 2 : 1$.
- On CF, a lamp post R is installed such that $CR : RF = 2 : 1$.

Find the coordinates of points Q and R. Do the three lamp posts P, Q and R coincide at the same point?

OR

(b) By measuring the side lengths of the park, show that the triangular park is isosceles. Also, calculate the area of the park.

[1 + 1 + 2 = 4

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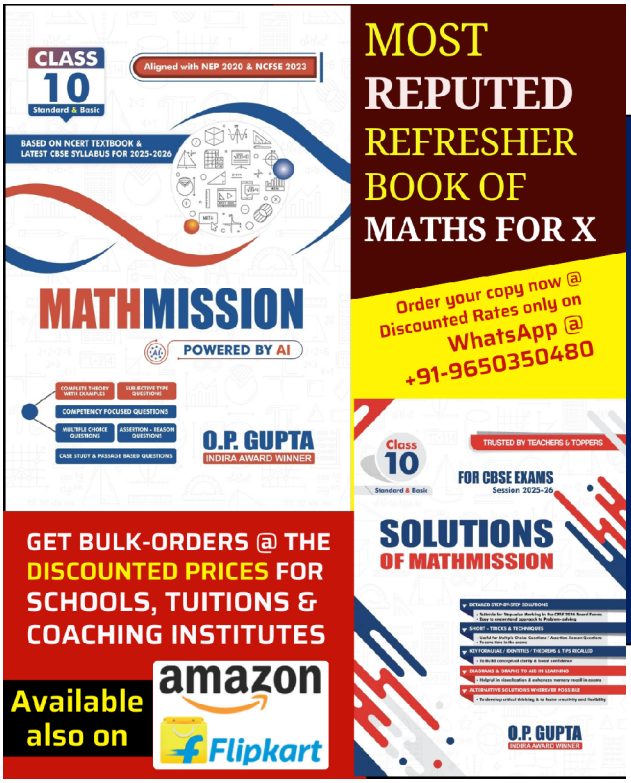

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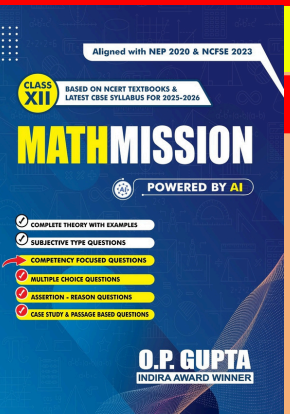

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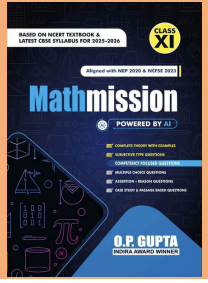

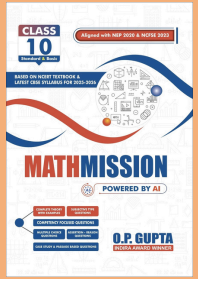

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