



Time: 3 hours

SUBJECT – MATH (IIT-JEE)

Marks: 50

(Straight line)

NAME OF STUDENT:- _____

DATE:- / /

❖ **INSTRUCTION:- ATTEMPT ALL QUESTION.**

Q1. The x-coordinate of the incentre of the triangle that has the coordinates of mid-points of its sides as $(0,1)$, $(1,1)$ and $(1,0)$ is.

- (a) $2 + \sqrt{2}$ (b) $2 - \sqrt{2}$ (c) $1 + \sqrt{2}$ (d) $1 - \sqrt{2}$

Q2. Let $O(0,0)$, $P(3,4)$ and $Q(6,0)$ be the vertices of a ΔOPQ . the point R inside the ΔOPQ is such that the triangles OPR, PQR, and OQR are of equal area. The coordinates of R are.

- (a) $\left(\frac{4}{3}, 3\right)$ (b) $\left(3, \frac{2}{3}\right)$ (c) $\left(3, \frac{4}{3}\right)$ (d) $\left(\frac{4}{3}, \frac{2}{3}\right)$

Q3. The incentre of the triangle with vertices $(1, \sqrt{3})$, $(0,0)$ and $(2,0)$ is

- (a) $\left(1, \frac{\sqrt{3}}{2}\right)$ (b) $\left(\frac{2}{3}, \frac{1}{\sqrt{3}}\right)$ (c) $\left(\frac{2}{3}, \frac{\sqrt{3}}{2}\right)$ (d) $\left(1, \frac{1}{\sqrt{3}}\right)$

Q4. Suppose that the points (h,k) , $(1,2)$ and $(-3,4)$ lie on the line L_1 . If a line L_2 passing through the point (h,k) and $(4,3)$ is perpendicular to L_1 , then k/h equals.

- (a) $-1/7$ (b) $1/3$ (c) 3 (d) 0

Q5. If the straight line $2x - 3y + 17 = 0$ is perpendicular to the line passing through the points $(7,17)$ and $(15,\beta)$ then β equals

- (a) $\frac{35}{3}$ (b) -5 (c) $\frac{-35}{3}$ (d) 5

Q6. A triangle has a vertex at $(1,2)$ and the mid-points of the two sides through it are $(-1,1)$ and $(2,3)$. Then the centroid of this triangle is.

- (a) $\left(1, \frac{7}{3}\right)$ (b) $\left(\frac{1}{3}, 2\right)$ (c) $\left(\frac{1}{3}, 1\right)$ (d) $\left(\frac{1}{3}, \frac{5}{3}\right)$

Q7. A point P moves on the line $2x - 3y + 4 = 0$. If $Q(1,4)$ and $R(3,-2)$ are fixed points, then the locus of the centroid of ΔPQR is a line

- (a) With slope $\frac{2}{3}$ (b) With slope $\frac{3}{2}$
(c) parallel to $y - axis$ (d) parallel to $x - axis$

Q8. The set of all possible values of θ in the interval $(0, \lambda)$ for which the points $(1,2)$ and $(\sin\theta, \cos\theta)$ lie on the same side of the line $x + y = 1$ is.

- (a) $\left(0, \frac{\lambda}{2}\right)$ (b) $\left(\frac{\lambda}{4}, \frac{3\lambda}{4}\right)$ (c) $\left(0, \frac{3\lambda}{4}\right)$ (d) $\left(0, \frac{\lambda}{4}\right)$

Q9. Slope of a line passing through P $(2,3)$ and intersecting the line $x + y = 7$ at a distance of 4 units from P is.

- (a) $\frac{1-\sqrt{5}}{1+\sqrt{5}}$ (b) $\frac{\sqrt{7}-1}{\sqrt{7}+1}$ (c) $\frac{1-\sqrt{7}}{1+\sqrt{7}}$ (d) $\frac{\sqrt{5}-1}{\sqrt{5}+1}$

Q10. If in a parallelogram ABCD the coordinate of A,B and C are respectively $(1,2)$, $(3,4)$ and $(2,5)$ then the equation of the diagonal AD is

- (a) $3x + 5y - 13 = 0$ (b) $3x - 5y + 7 = 0$
(c) $5x - 3y + 1 = 0$ (d) $5x + 3y - 11 = 0$

Q11. If PS is the median of the triangle with vertices P(2,2) Q(6,-1) and R(7,3) then equation of the line passing through (1,-1) and parallel to PS is

(a) $4x - 7y - 11 = 0$

(b) $2x + 9y + 7 = 0$

(c) $4x + 7y + 3 = 0$

(d) $2x - 9y - 11 = 0$

Q12. If a straight line passing through the point P(-3,4) is such that its intercepted portion between the coordinate axis is bisected at P, then its equation is

(a) $x - y + 7 = 0$

(b) $4x - 3y + 24 = 0$

(c) $8x - 4y + 25 = 0$

(d) $4x + 3y = 0$