Linears and Conics

Linear 1

1. If the two lines

$$\mathbf{L}_1: \mathbf{x} = 5, \frac{y}{3-\alpha} = \frac{z}{-2}$$

$$\mathbf{L}_1: \mathbf{x} = 2, \frac{y}{-1} = \frac{z}{z-\alpha}$$

are perpendicular, then the value of $\boldsymbol{\alpha}$

- (a) $\frac{2}{3}$
- (b) 3
- (c) 4
- (d) $\frac{7}{3}$
- 2. Find the shortest distance between the following lines and hence write whether the lines are intersecting or not.

$$\frac{x-1}{2} = \frac{y+1}{3} = z \tag{1}$$

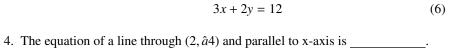
$$\frac{x-1}{2} = \frac{y+1}{3} = z$$

$$\frac{x+1}{5} = \frac{y-2}{1}, z = 2$$
(1)

OR

Find the equation of the plane through the line of intersection of the planes \vec{r} . $(\hat{i}+3\hat{j})+6=0$ and \vec{r} . $(3\hat{i}-\hat{j}-4\hat{k})=0$, which is at a unit distance from the origin.

3.	If segment of the line intercepted between the co-ordinate-axes is bisected at the point $M(2,3)$, then the equation of this line is	
	2x + 3y = 13	(3)
	x + y = 5	(4)



2x + y = 7

- 5. Find the equation of the median through vertex A of the triangle ABC, having vertices A(2,5), $B(\hat{a}4,9)$ and $C(\hat{a}2,\hat{a}1)$.
- 6. Solve the system of linear equations, using matrix method :

$$7x + 2y = 11 (7)$$

$$4x - y = 2 \tag{8}$$

(5)

2 Conic

1. The point at which the normal to the curve $y = x + \frac{1}{x}$, x > 0 is perpendicular to the line $3x\hat{a}4y\hat{a}7 = 0$ is:

a)
$$(2, \frac{5}{2})$$
 b) $(\pm 2, \frac{5}{2})$ c) $(-\frac{1}{2}, \frac{5}{2})$ d) $(\frac{1}{2}, \frac{5}{2})$

2. The points on the curve $\frac{x^2}{9} + \frac{y^2}{16} = 1$ at which the tangents are parallel to y-axis are:

$$a)(0,\pm 4)$$
 $b)(\pm 4,0)$ $c) (\pm 3,0)$ $d) (0,\pm 3)$

- 3. For which value of m is the line y = mx + 1 a tangent to the curve $y^2 = 4x$? a) $\frac{1}{2}$ b) 1
 - c)2 d)3