Reg.No. :

I. Answer all the Questions.

II. Use blue pen only.

Time : 03:00:00 Hrs

Total Marks : 86

Section-A

4 x 1 = 4

1) The co-ordinate of the vertices of the rectangular hyperbola xy = 16 are

   (a) $(4,4)\ (-4,-4)$ (b) $(2,8)\ (-2,-8)$ (c) $(4,0)\ (-4,0)$ (d) $(8,0)\ (-8,0)$

2) One of the foci of the rectangular hyperbola xy=32 is

   (a) (6,6)   (b) (3,3)   (c) (4,4)   (d) (5,5)

3) The length of the latus rectum of the rectangular hyperbola xy = 32 is

   (a) $8\sqrt{2}$ (b) 32   (c) 8   (d) 16

4) The area of the triangle formed by the tangent at any point on the rectangular hyperbola xy = 72 and its asymptotes is

   (a) 36   (b) 18   (c) 72   (d) 144

Section-B

4 x 3 = 12

5) Find the equation of the hyperbola if centre : (0,0) length of the semi – transverse axis is 6 ; e = 3, transverse axis is parallel to y-axis.

6) Find the equation of the parabola if Vertex (3, -1); open rightward; the distance between the latus rectum and the directrix is 4.

7) Find the equation of the parabola if Vertex (2, 3); open upward and passing through the point: (6, 4).

8) Find the equation of the parabola if the vertex is (0,0) and the focus is (-a, 0), a>0.

Section-C

5 x 6 = 30

9) Find the equations of the tangent and normal to the ellipse $x^2 + 4y^2 = 32$ at $\theta = \frac{\pi}{4}$

10) Find the equations of the tangent and normal to the ellipse $16x^2 + 25y^2 = 400$ at $t = \frac{1}{\sqrt{3}}$

11) Find the equations of the tangent and normal to the hyperbola $\frac{x^2}{9} - \frac{y^2}{12} = 1$ at $\theta = \frac{\pi}{6}$

12) Find the equations of the tangent and normal to the ellipse $2x^2 + 3y^2 = 6$ at $(\sqrt{3},0)$

13) a)   Find the equations of the tangent and normal to the hyperbola $9x^2 - 5y^2 = 31$ at $(2,-1)$

   (OR)

   b)   Find the equations of the two tangents that can be drawn from the point (1,3) to the ellipse 4x²+9y²=36

Section-D

4 x 10 = 40

14) Find the eccentricity, centre, foci, and vertices of the following hyperbola and draw the diagram : $9x^2 - 16y^2 + 36x + 32y + 164 = 0$

15) Find the eccentricity centre, foci and vertices of the following hyperbolas and draw their diagrams. $x^2 - 3y^2 + 6x + 6y + 18 = 0$

16) Find the eccentricity, centre, foci, vertices of the following ellipses and draw the diagram: $16x^2 + 9y^2 + 32x - 36y = 92$

17) Find the axis, vertex, focus, directrix, equation of the latus rectum, length of the latus rectum for the following parabolas and hence draw their graphs

   $y^2 - 8x + 6y + 9 = 0$

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