Maths

Reg.No. :

I.Answer all the Questions.

II.Use blue pen only.

Time : 02:00:00 Hrs

Total Marks : 81

Section-A

5 x 1 = 5

1) If the length of major and semi-minor axes of an ellipse are 8,2 and their corresponding equations $y - 6 = 0$ and $x + y = 0$ then the equations of the ellipse is

   (a) $\frac{(x+4)^2}{4} + \frac{(y-6)^2}{16} = 1$ (b) $\frac{(x+4)^2}{16} + \frac{(y-6)^2}{4} = 1$ (c) $\frac{(x+4)^2}{16} - \frac{(y-6)^2}{4} = 1$ (d) $\frac{(x+4)^2}{4} - \frac{(y-6)^2}{16} = 1$

2) The straight line $2x - y + c = 0$ is a tangent to the ellipse $4x^2 + 8y^2 = 32$ if c is.

   (a) $\pm 2\sqrt{3}$ (b) ± 6 (c) 36   (d) ± 4

3) The sum of the distance of any point on the ellipse $4x^2 + 9y^2 = 36$ from $\left(\sqrt{5}, 0\right)$ and $\left(-\sqrt{5}, 0\right)$ is

   (a) 4   (b) 8   (c) 6   (d) 18

4) The radius of the director circle of the conic $9x^2 + 16y^2 = 144$ is

   (a) $\sqrt{7}$ (b) 4   (c) 3   (d) 5

5) The locus of foot of perpendicular from the focus to a tangent of the curve $16x^2 + 25y^2 = 400$ is

   (a) $x^2 + y^2 = 4$ (b) $x^2 + y^2 = 25$ (c) $x^2 + y^2 = 16$ (d) $x^2 + y^2 = 9$

Section-B

4 x 3 = 12

6) Find the equation of the parabola if Vertex(0, 0); focus: (0,-4).

7) Find the equation of the parabola if Vertex (1, 4); focus: (-2, 4).

8) Find the equation of the parabola if Vertex(1, 2); flatus return: y=5

9) Find the equation of the parabola if Vertex (1, 4); open leftward and passing through the point: (-2, 10).

Section-C

4 x 6 = 24

10) A standard rectangular hyperbola has its vertices at (5,7) and (-3,-1). Find its equation and asymptotes.

11) Find the equation of the rectangular hyperbola which has its centre at (2,1) one of its asymptotes $3x - y - 5 = 0$ and which passes through the point (1,-1).

12) Prove that the tangent at any point to the rectangular hyperbola forms with the asymptotes a triangle of constant area.

13) 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.
$(y + 2)^2 = -8(x + 1)$

Section-D

4 x 10 = 40

14) Find the axis , vertex, focus, equation of directrix, latus rectum, length of the latus rectum for the following parabolas and hence sketch their graphs.
$y^2 + 8x - 6y + 1 = 0$

15) Find the eccentricity centre, foci and vertices of the following hyperbolas and draw their diagrams. $x^2 - 4y^2 + 6x + 16y - 11 = 0$

16) Find the axis , vertex, focus, equation of directrix, latus rectum, length of the latus rectum for the following parabolas and hence sketch their graphs.
$x^2 - 6x - 12y - 3 = 0$

17) a) Find the axis, vertex, focus, equation of directrix and latus rectum and length of the latus rectum of the $x^3 - 4x + 4y = 0$ parabola and hence draw the diagram.

(OR)

   b) Find the eccentricity, centre, foci and vertices of the following hyperbola and draw the diagram $12x^2 - 4y^2 - 24x + 32y - 127 = 0$

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