Model Question Paper

Analytical Geometry - Part II

12th Standard

Maths

Reg.No. : | | | | | | |

I.Answer all the Questions.

II.Use blue pen only.

Time : 01:00:00 Hrs

Total Marks : 73

Section-A

4 x 1 = 4

1) The directrix of the parabola $y^2 = x + 4$ is

   (a) $x = \frac{15}{4}$ (b) $x = -\frac{15}{4}$ (c) $x = -\frac{17}{4}$ (d) $x = \frac{17}{4}$

2) The length of the latus rectum of the parabola whose vertex $(2, -3)$ and the directrix x=4 is

   (a) 2 (b) 4 (c) 6 (d) 8

3) The focus of the parabola $x^2 = 16y$ is

   (a) $(4, 0)$ (b) $(0, 4)$ (c) $(-4, 0)$ (d) $(0, -4)$

4) The vertex of the parabola $x^2 = 8y - 1$ is

   (a) $\left(-\frac{1}{8}, 0\right)$ (b) $\left(\frac{1}{8}, 0\right)$ (c) $\left(0, \frac{1}{8}\right)$ (d) $\left(0, -\frac{1}{8}\right)$

Section-B

3 x 3 = 9

5) Find the equation of the parabola if the curve is open upward, vertex is (-1,-2) and the length of the latus rectum is 4.

6) Find the equation of the parabola if the curve is open leftward, vertex is (2,0) and the distance between the latus rectum and directrix is 2.

7) Find the equation of the hyperbola whose transverse axis is parallel to y - axis , centre (0,0) , length of semi-conjugate axis is 4 and eccentricity is 2.

Section-C

5 x 6 = 30

8) Find the equations and length of major and minor axes of $5x^2 + 9y^2 + 10x - 36y - 4 = 0$

9) Find the equations of directrices, latus rectum and length of latus rectums of the following ellipses: $x^2 + 4y^2 - 8x - 16y - 68 = 0$

10) Find the equation of the hyperbola if (i) focus : (2,3) ; corresponding directrix : $x + 2y = 5, e = 2$

11) Find the equation and length of transverse and conjugate axes of the following hyperbolas: $16x^2 - 9y^2 + 96x + 36y - 36 = 0$

12) a) Find the equation of the tangent at t = 1 to the parabola $y^2 = 12x$.

    b) Find the equation of chord of contact of tangents from the point (2,4) to the ellipse $2x^2 + 5y^2 = 20$

Section-D

4 x 10 = 40

13) The arch of a bridge is in the shape of a semi –ellipse having a horizontal span of 40ft and 16ft high at the centre. How high is the arch, 9ft from the right or left of the centre.

14) Prove that the line $5x + 12y = 9$ touches the hyberbola $x^2 - 9y^2 = 9$ and find its points of contact.

15) Show that the line $x - y + 4 = 0$ is a tangent to the ellipse $x^2 + 3y^2 = 12$. Find the co-ordinates of the point of contact

16) Find the equation of the hyperbola if its asymptotes are parallel to $x + 2y - 12 = 0$ and $x - 2y + 8 = 0$, (2,4) is the centre of the hyperbola and it passes through (2,0).

****