Model Question Paper

Analytical Geometry - Part I

12th Standard

Maths

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

I.Answer all the Questions.

II.Use blue pen only.

Time : 02:00:00 Hrs

Total Marks : 100

Section-A

5 x 1 = 5

1) The axis of the parabola $y^2 - 2y + 8x - 23 = 0$ is

   (a) $Y = -1$ (b) $x = -3$ (c) $x = 3$ (d) $y = 1$

2) $16x^2 - 3y^2 - 32x - 12y - 44 = 0$ represents

   (a) an ellipse (b) a circle (c) a parabola (d) a hyperbola.

3) The line $4x + 2y = c$ is a tangent to the parabola $y^2 = 16x$ then c is.

   (a) -1 (b) -2 (c) 4 (d) -4

4) The point of intersection of the tangents $t_1 = t$ and $t_2 = 3t$ to the parabola $y^2 = 8x$ is

   (a) $\left(6t^2, 8t\right)$ (b) $\left(8t, 6t^2\right)$ (c) $\left(t^2, 4t\right)$ (d) $\left(4t, t^2\right)$

5) The length of the latus rectum of the parabola $y^2 - 4x + 4y + 8 = 0$ is

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

Section-B

5 x 3 = 15

6) Find the equation of the ellipse if one of the foci is (0,-1) , the corresponding directrix is$3x + 16 = 0 \quad and \quad e = \frac{3}{5}$

7) Find the equation of the following parabola with indicated focus and directrix. $(a, 0); \quad x = -a \quad a > 0$

8) Find the equation of the parabola if the vertex is (4,1) and the focus is (4,-3)

9) Find the equation of the parabola whose vertex is (1,2) and the equation of the latus rectum is x = 3.

10) Find the equation of the parabola if the curve is open rightward, vertex is (2,1) and passing through point (6,5)

Section-C

5 x 6 = 30

11) Find the axis, vertex ,focus equation of directrix, latus rectum, length of the latus rectum from the following parabolas and hence sketch their graphs $(x-4)^2 = 4(y+2)$

12) If a parabolic reflector is 20cm in diameter and 5cm deep, find the distance of the focus from the centre of the reflector.

13) The focus of a parabolic mirror is at a distance of 8cm from its centre (vertex). If the mirror is 25cm deep, find the diameter of the mirror.

14) Find the equation of the ellipse if the foci are (2,-1) , (0,-1) and $e = \frac{1}{2}$

15) Find the locus of a point which moves so that the sum of its distances from (3,0) and (-3,0) is 9.

Section-D

5 x 10 = 50

16) A cable of a suspension bridge is in the form of a parabola whose span is 40 mts. The road way is 5 mts below the lowest point of the cable. If an extra support is provided across the cable 30 mts above the ground level find the length of the support if the height of the pillars are 55 mts.

17) Find the eccentricity, centre, foci, vertices of the following ellipses and draw the diagram: $x^2 + 4y^2 - 8x - 16y - 68 = 0$

18) A kho-kho player in a practice session while running realizes that the sum of the distances from the two kho-kho pples from him is always 8m. Find the equation of the path traced by him if the distance between the poles is 6m.

19) A satellite is traveling around the earth in an elliptical orbit having the earth at a focus and of eccentricity 1/2. The shortest distance that the satellite gets to the earth is 400 kms. Find the longest distance that the satellite gets from the earth.

20) The orbit of the planet mercury around the sun is in elliptical shape with sun at a focus. The semi-major axis is of length 36 million miles and the eccentricity of the orbit is 0.206. Find (i) how close the mercury gets to sun? (ii) the greatest possible distance between mercury and sun.

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