(80)

ERK HIGHER SECONDARY SCHOOL

CLASS:- 12 ERUMIYAMPATTI Marks: 50

MATHEMATICS Time : 1.30 Hrs

UNIT TEST - CHAPTER - 5

10 x 1 = 10

1. CHOOSE THE CORRECT ANSWER!

1. The eccentricity of the hyperbola whose latus rectum is 8 and conjugate axis is equal to half the distance between the foci is
(1) $\frac{4}{3}$ (2) $\frac{3}{2}$ (3) $\frac{4}{\sqrt{3}}$ (4) $\frac{2}{\sqrt{3}}$

2. The centre of the circle inscribed in a square formed by the lines $x^2 - 8x - 12 = 0$ and $y^2 - 14y + 45 = 0$ is
(1) (9,4) (2) (4,9) (3) (7,4) (4) (4,7)

3. Area of the greatest rectangle inscribed in the ellipse $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$ is
(1) $\frac{a}{b}$ (2) $\sqrt{ab}$ (3) ab (4) 2ab

4. Tangents are drawn to the hyperbola $\frac{x^2}{9} - \frac{y^2}{4} = 1$ parallel to the straight line $2x - y = 1$. One of the points of contact of tangents on the hyperbola is
(1) $\left(\frac{-9}{2\sqrt{2}}, \frac{1}{\sqrt{2}}\right)$ (2) $\left(\frac{9}{2\sqrt{2}}, \frac{1}{\sqrt{2}}\right)$ (3) $\left(\frac{9}{2\sqrt{2}}, \frac{-1}{\sqrt{2}}\right)$ (4) $(3\sqrt{3}, -2\sqrt{2})$

5. How many tangents can be drawn to the hyperbola, from any external point on the plane?
(1) 1 (2) 2 (3) 3 (4) 4

6. Identify the type of the conic for $x^2 - 2y = x + 3$?
(1) Ellipse (2) Circle (3) Parabola (4) Hyperbola

7. If (x_1, y_1) is a point on the circle, then both tangents ——.
(1) real (2) imaginary (3) coincide (4) None of these.

8. The eccentricity of the circle is
(1) 1 (2) greater than 1 (3) less than 1 (4) 0

9. If the coordinates at one end of a diameter of the circle $x^2 + y^2 - 8x - 4y + c = 0$ are (11,2) the coordinates of the other end are
(1) (-5,2) (2) (2,-5) (3) (-2,5) (4) (5,-2)

10. The radius of the circle $3x^2 + by^2 + 4bx - 6by + b^2 = 0$ is
(1) 1 (2) $\sqrt{10}$ (3) $\sqrt{11}$ (4) 3

11. ANSWER IT : 4 x 2 = 8

11. Find the equation of the circle described on the chord $3x + y + 5 = 0$ of the circle $x^2 + y^2 = 16$ as diameter.

12. Prove that the length of the latus rectum of the hyperbola $\frac{x^2}{a^2} - \frac{y^2}{b^2} = 1$ is $\frac{2b^2}{a}$.

13. Identify the type of conic section for each of the equations.
(i) $11x^2 - 25y^2 - 44x + 50y - 256 = 0$ (ii) $3x^2 + 2y^2 = 14$

14. A concrete bridge is designed as a parabolic arch. The road over bridge is 40m long and the maximum height of the arch is 15m. Write the equation of the parabolic arch.

III. ANSWER IT:- 4X3=12

15. Show that the sum of the focal distances of any point on the ellipse is equal to length of the major axis.

16. A line $3x+4y+10=0$ cuts a chord of length 6 units on a circle with centre of the circle (2,1). Find the equation of the circle in general form.

17. Find the equation of the tangent to the parabola $y^2=16x$ perpendicular to $2x+2y+3=0$

18. A bridge has a parabolic arch that is 10m high in the centre and 30m wide at the bottom. Find the height of the arch 6m from the centre, on either sides.

IV. ANSWER IT:- 4X5=20

19. Find the equation of the circle through the points (1,0), (-1,0) and (0,1)

20. For the ellipse $4x^2+y^2+24x-2y+21=0$, find the centre, vertices and the foci. Also prove that the length of latus rectum is 2.

21. Assum that water issuing from the end of a horizontal pipe, 7.5m above the ground, describes a parabolic path. The vertex of the parabolic path is at the end of the pipe. At a position 2.5m below the line of the pipe, the flow of water has curved outward 3m beyond the vertical line through the end of the pipe. How far beyond this vertical line will the water strike the ground?

22. Identify the type of conic and find centre, foci, vertices and directrices of $9x^2-16y^2+36x+32y+164=0$.

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