



XI-SCI : Maths
Conic Section,

DATE:

TIME: 1 Hours 30
Minutes

MARKS: 25

SEAT NO:

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Note:-

1. All Questions are compulsory.
2. Numbers on the right indicate full marks.

Section A

Q.1. Select and write the correct answer.

(4)

1. The line $y = mx + 1$ is tangent to the parabola $y^2 = 4x$ if m is
A) 1 B) 2
C) 3 D) 4
2. Eccentricity of the parabola $x^2 - 4x - 4y + 4 = 0$ is
A) $e = 1$ B) $e = -1$
C) $e = 0$ D) $e < 1$

Q.2. Answer the following.

(3)

1. Find the eccentricity of an ellipse, if the distance between its directrix is three times the distance between its foci.
2. Find the co-ordinates of a point of the parabola $y^2 = 8x$ having focal distance 10.
3. Find the
 - (i) lengths of the principal axes
 - (ii) co-ordinates of the foci
 - (iii) equations of directrices
 - (iv) length of the latus rectum
 - (v) distance between foci
 - (vi) distance between directrices of the curve
$$\frac{x^2}{25} + \frac{y^2}{9} = 1$$

Section B
Attempt any Four

- Q.3 Find the equation of the locus of a point the tangents from which to the ellipse $3x^2 + 5y^2 = 15$ are at right angles. **(2)**
- Q.4 For each of the following parabolas, find focus, equation of the directrix, length of the latus rectum, and ends of the latus rectum $2y^2 = 17x$ **(2)**
- Q.5 Find the equation of the ellipse in standard form if the length of major axis 10 and the distance between foci is 8. **(2)**
- Q.6 Find the equation of the ellipse in standard form if the dist. between its directrix is 10 and which passes through $(-\sqrt{5}, 2)$ **(2)**

Q.7 Find the equation of the tangent to the parabola $y^2 = 8x$ at $t = 1$ on it. (2)

Q.8 For the parabola $y^2 = 4x$, find the co-ordinates of the point whose focal distance is 17. (2)

Section C
Attempt any Two

Q.9 If the tangent drawn from the point $(-6, 9)$ to the parabola $y^2 = kx$ are perpendicular to each other, find k . (3)

Q.10 Find co-ordinates of focus, equation of directrix, length of latus rectum and the co-ordinates of end points of latus rectum of the parabola : $3x^2 = 8y$ (3)

Q.11 A circle whose centre is $(4, -1)$ passes through the focus of the parabola $x^2 + 16y = 0$. Show that the circle touches the directrix of the parabola. (3)

Section D
Attempt any One

Q.12 Find the $\frac{x^2}{144} - \frac{y^2}{25} = 1$ (4)

(i) lengths of the principal axes

(ii) co-ordinates of the foci

(iii) equations of directrices

(iv) length of the latus rectum

(v) distance between foci

(vi) distance between directrices of the curve

Q.13 Two tangents to the parabola $y^2 = 8x$ meet the tangent at the vertex in P and Q . If $PQ = 4$, prove that the locus of the point of intersection of the two tangents is $y^2 = 8(x + 2)$. (4)