CONIC-SECTION

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1 SECTION B

1) A hyperbola passes through point $\mathbf{P}\left(\sqrt{2},\ \sqrt{2}\right)$ and has foci at $(\pm 2, 0)$. Then the tangent to this hyperbola at $\mathbf{P}$ also passes through the point : (JEE M 2017)
   a) $\left(-\sqrt{2}, -\sqrt{3}\right)$
   b) $\left(3\sqrt{2}, 2\sqrt{3}\right)$
   c) $\left(2\sqrt{2}, 3\sqrt{3}\right)$
   d) $\left(\sqrt{3},\ \sqrt{2}\right)$

2) The radius of a circle, having minimum area, which touches the curve $y = 4 - x^2$ and the lines, $y = |x|$ is : (JEE M 2018)
   a) $4\left(\sqrt{2}+1\right)$
   b) $2\left(\sqrt{2}+1\right)$
   c) $2\left(\sqrt{2}-1\right)$
   d) $4\left(\sqrt{2}-1\right)$

3) Tangents are drawn to the hyperbola $4x^2 - y^2 = 36$ at the points $\mathbf{P}$ and $\mathbf{Q}$. If these tangents intersect at the point $\mathbf{T}(0, 3)$ then the area (in sq.units) of Δ PTQ is: (JEE M 2018)
   a) $54\sqrt{3}$
   b) $60\sqrt{3}$
   c) $36\sqrt{3}$
   d) $45\sqrt{5}$

4) Tangent and normal are drawn at $\mathbf{P}(16, 16)$ on the parabola $y^2 = 16x$, which is intersect the axis of the parabola at $\mathbf{A}$ and $\mathbf{B}$, respectively. If $\mathbf{C}$ is the centre of the circle through the points $\mathbf{P}$, $\mathbf{A}$ and $\mathbf{B}$ and $\angle$ CPB=θ, then the value of $\tan\theta$ is : (JEE M 2018)
   a) 2
   b) 3
   c) $\frac{4}{3}$
   d) $\frac{1}{2}$

5) Two sets A and B are as under: $A = \{(a, b) \in \mathbb{R} \times \mathbb{R} : |a-5| < 1 \text{ and } |b-5| < 1\}$ $B = \left\{(a, b) \in \mathbb{R} \times \mathbb{R} : 4(a-6)^2 + 9(b-5)^2 \leq 36\right\}$ (JEE M 2018)
   a) $A \subset B$
   b) $A \cap B$
   c) neither $A \subset B$ nor $B \subset A$
   d) $B \subset A$

6) If the tangent at $(1, 7)$ to the curve $x^2 = y-6$ touches the circle $x^2+y^2+16x+12y+c = 0$ then the value of c is : (JEEM 2018)

a) 185
b) 85
c) 95
d) 195

7) Axis of a parabola lies along X-axis. If its vertex and focus are at a distance 2 and 4 respectively from origin, on the positive X-axis then which of the following points does not lie on it? (JEE M 2018)

a) $\left(5, 2\sqrt{6}\right)$
b) $(8, 6)$
c) $\left(6, 4\sqrt{2}\right)$
d) $(4, -4)$

8) Let $0 < \theta < \pi/2$. If the eccentricty of the hyperbola $\frac{x^2}{\cos^2\theta} - \frac{y^2}{\sin^2\theta} = 1$ is greater than 2, then the length of its latus rectum lies in the interval: (JEE M 2019-9 Jan(M)

a) $(5, \infty)$
b) $\left(\frac{3}{2}, 3\right]$
c) $(2, 3]$
d) $\left(1, \frac{3}{2}\right]$

9) Equation of a common tangent to the circle $x^2+y^2-6x = 0$ and the parabola $y^2 = 4x$, is: (JEE M 2019-9 Jan(M))

a) $2\sqrt{3}y = 12x + 1$
b) $\sqrt{3}y = x + 3$
c) $2\sqrt{3}y = -x - 12$
d) $\sqrt{3}y = 3x + 1$

10) If the line $y = mx + 7\sqrt{3}$ is normal to the hyperbola $\frac{x^2}{24} - \frac{y^2}{18}$ then a value of m is: (JEEM 2019-9 April(M))

a) $\frac{\sqrt{5}}{2}$
b) $\frac{\sqrt{15}}{2}$
c) $\frac{2}{\sqrt{5}}$
d) $\frac{3}{\sqrt{5}}$

11) If one end of a focal chord of the parabola, $y^2 = 16x$ is at $(1, 4)$,then the length of this focal chord is : (JEE M 2019-9 Jan(M))

a) 25
b) 22
c) 24
d) 20