14-08-15_Sr.IPLCO_JEE-Main_RPTM-3_ Syllabus

Mathematics:

Ellipse And Hyperbola In Standard Form, Their Foci, Directrices And Eccentricity,

Parametric Equations, Equations Of Tangent And Normal, Locus Problems

Physics:

W.P.E& Circular Motion

Chemistry:

Benzene: Preparation, Reactions, Electrophilic aromatic substitution,

Alkyl halides, Haloarenes: Preparation, properties and reactions

MATHEMATICS

61. The Area of circle circumscribing the quadrilateral formed by directrices of the ellipses $\frac{x^2}{16}+\frac{y^2}{9}=1,\ \frac{x^2}{9}+\frac{y^2}{16}=1$ is _____units.

1) $\frac{64\pi}{7}$ 2) $\frac{256\pi}{7}$ 3) $\frac{512\pi}{7}$ 4) 25π

62. If F_1, F_2 are foci of $\frac{x^2}{16}+\frac{y^2}{4}=1$ then locus of reflection of F_2 with respect to any tangent of the ellipse is a circle with radius equal to

1)8 2)12 3) $2\sqrt{3}$ 4) 16

63. If C is centre of hyperbola $\frac{x^2}{4}-y^2=1$ and A is any point on it. If tangent at A meet the asymptotes of the hyperbola at Q, R then CQ.CR =

1)4 2)5 3)3 4) $\sqrt{3}$

64. The minimum length of intercept on any tangent to the ellipse $9x^2+4y^2=36$ cut by the circle $x^2+y^2=25$ is

1)8 2)9 3)2 4) $2\sqrt{11}$

65. A chord of conic $5x^2+4xy+y^2=1$ passes through origin is bisected at the point (m,n) then the value of $(m-n+3)^2=$

1)1 2)9 3)25 4)16

66. The normal to the curve $xy=4$ at the point $(1,4)$ meet, the curve again at

1) $(-4,-1)$ 2) $\left(-8,-\frac{1}{2}\right)$ 3) $\left(-16,-\frac{1}{4}\right)$ 4) $(-1,-4)$

67. The eccentricity of conjugate hyperbola of the hyperbola H,

$H=\left\{(x,y)\in R^2 \middle| \ \left|\sqrt{(x-1)^2+(y-2)^2}-\sqrt{(x-5)^2+(y-5)^2}\ \right|=3\ \right\}$ is e_1 then $16e_1$=

1)12 2)20 3)80 4)17

68. The length of smallest chord of the ellipse $x^2+xy+y^2=1$ is

1) $\sqrt{\frac{2}{3}}$ 2) $\frac{1}{\sqrt{2}}$ 3) $2\sqrt{2}$ 4) $\sqrt{\frac{8}{3}}$

69. AA' is major axis of an ellipse $3x^2+2y^2+6x-4y-1=0$ and P is a variable point on it. Then greatest area of triangle APA' is _____ units

1) $\sqrt{3}$ 2) $2\sqrt{2}$ 3) $2\sqrt{3}$ 4) $\sqrt{6}$

70. If normals at the points $P\left(\frac{\pi}{4}\right)$ and $Q\left(\frac{3\pi}{4}\right)$ on the ellipse $\frac{x^2}{a^2}+\frac{y^2}{b^2}=1$ $(a>b)$, with eccentricity e include an angle $\frac{\pi}{4}$ then e^2

1) $\frac{2\sqrt{2}-1}{3}$ 2) $2\sqrt{2}-2$ 3) $\frac{3+\sqrt{5}}{4}$ 4) $\sqrt{3}-1$

71. The set of all values of λ for which the point $(\lambda, \lambda+1)$ is an interior point of the smaller segment of the ellipse $x^2+2y^2=2$ made by the chord whose midpoint is $\left(\frac{1}{3},\frac{1}{6}\right)$ is

1) $\left(\frac{-1}{3},0\right)$ 2) $\left(\frac{-1}{4},0\right)$ 3) $\left(-\infty,\frac{-1}{3}\right)$ 4) $\left(\frac{-1}{4},1\right)$

72. A line with slope m is a tangent to ellipse $\frac{x^2}{a^2}+\frac{y^2}{b^2}=1$ and a parabola $y^2=4ax$

1)For all values of m in $(-1,1)$ 2)Except for one value of m in $(-1,1)$

2)Except for two values of m in $(-1,1)$ 4)Except for three values of m in $(-1,1)$

73. A line PQ touches ellipse $\frac{x^2}{16}+\frac{y^2}{9}=1$ and the circle $x^2+y^2=r^2\,(3<r<4)$. RS is focal chord parallel to PQ meet the circle at the points R and S. Then length of RS=

1)7 2) $\sqrt{7}$ 3)6 4)8

74. If PQ is a focal chord of ellipse $\frac{x^2}{25}+\frac{y^2}{16}=1$ which passes through focus S=$(3,0)$ and SQ=2 then length of chord PQ=

1) $2\sqrt{2}$ 2)8 3)10 4) $5\sqrt{2}$

75. If any tangent to hyperbola $\frac{x^2}{a^2}-\frac{y^2}{b^2}=1$ meets its director circle at P and Q then product of the slopes of the lines OP and OQ, where O origin, is

1) $\frac{a^2}{b^2}$ 2) $\frac{b^2}{a^2}$ 3) $\frac{a}{b}$ 4) $\frac{b}{a}$

76. Let D_1, D_2 be ends of the diameter $4x-y=15$ of the circle $x^2+y^2-6x+6y-16=0$. D_1, D_2 lie on tangents at the end points of the major axis of an ellipse such that line joining D_1, D_2 is a tangent to the same ellipse at a point P. If the major axis of the ellipse is along the line $y=x$ then the distance between the foci is_____

1) $2\sqrt{2}$ 2) $4\sqrt{2}$ 3) 8 4) $2\sqrt{3}$

77. Tangents are drawn from points on the line $x-y-5=0$ to $x^2+4y^2=4$, then all such chords of contact pass through a fixed point (α,β) then $|\alpha|+|\beta|=$

1) $\frac{2}{5}$ 2) $\frac{3}{5}$ 3)1 4)5

78. The foci F_1, F_2 of the ellipse $\frac{x^2}{16}+\frac{y^2}{b^2}=1$ are same as the foci of hyperbola $\frac{x^2}{144}-\frac{y^2}{81}=\frac{1}{25}$. if M,N are feet of perpendicular, drawn from F_1, F_2 respectively to the line $lx+my-7=0$ which is tangent to ellipse then $(F_1M)(F_2N)=$

1)7 2)9 3) $\frac{81}{25}$ 4) $\frac{49}{16}$

79. If P,Q,R,S are co normal points on the ellipse $\frac{x^2}{25}+\frac{y^2}{16}=1$ and if a circle through P,Q,R cuts the ellipse again at T then the chord ST must pass through

1) $(5,0)$ 2) $(4,0)$ 3) $(0,0)$ 4) $(0,4)$

80. If $\begin{vmatrix} x_1 & y_1 & x_1y_1 \\ x_2 & y_2 & x_2y_2 \\ x_3 & y_3 & x_3y_3 \end{vmatrix}=0$ and points, $P(x_1,y_1), Q(x_2,y_2)$ and $R(x_3,y_3)$ lie on the hyperbola $\frac{x^2}{9}-\frac{y^2}{4}=1$ then

1)The normals, at P,Q,R form an equilateral triangle

2)The normals, at P,Q,R from an isosceles right angle triangle

3)The normal at P,Q,R do not form any triangle

4)The tangents at P,Q,R from an equilateral triangle

81. A hyperbola with eccenticity $\sqrt{2}$, has one focus at $(0,0)$ and one directrix as $x+y+1=0$ then equation of its pair of asymptotes is_____

1) $xy-x-y+1=0$ 2) $xy+x+y+1=0$ 3) $xy=0$ 4) $2xy+2x+2y+1=0$

82. The locus of middle points of chords of hyperbola $2x^2-3y^2=1$ each of which makes an angle $45°$ with the $x-axis$ is _____

1)a circle with radius $\frac{\sqrt{3}}{2}$ 2)a line with slope $\frac{2}{3}$

3)a line at a distance $\sqrt{13}$ from $(0,0)$ 4)a parabola with latus rectum $\frac{3}{2}$

83. If normal at one end of latus rectum of an ellipse $\frac{x^2}{a^2}+\frac{y^2}{b^2}=1$, a>b passes through one end of minor axis and its eccentricity e is such that $e^2\left(\cos ec\frac{\pi}{10}\right)=\lambda$ then

1) $\lambda^2-\lambda+1=0$ 2) $\lambda^2-\lambda-2=0$ 3) $\lambda^2+\lambda-1=0$ 4) $\lambda^2-\lambda+2=0$

84. If a tangent of slope 2 of the ellipse $\frac{x^2}{a^2}+\frac{y^2}{b^2}=1$ is normal to the cirlce $x^2+y^2+4x+1=0$ then maximum value $|ab|$ is

1)2 2)4 3)8 4)16

85. The vertices B ,C of a variable triangle ABC are (2,0),(8,0) respectively. The vertex A varies such that $\cot\frac{B}{2}\cot\frac{C}{2}=4$ then locus of A is

1) $16(x-5)^2+25y^2=400$ 2) $25(x-5)^2+16y^2=400$

3) $9(x-5)^2+25y^2=225$ 4) $25(x-5)^2+9y^2=225$

86. On the ellipse $\frac{x^2}{25}+\frac{y^2}{9}=1$ there are four points at a distance $\sqrt{13}$ from the origin, then the area of the quadrilateral formed by the tangents drawn to the ellipse at the four points is

1) $40\sqrt{3}$ 2) $80\sqrt{3}$ 3) $20\sqrt{3}$ 4) $\frac{40}{\sqrt{3}}$

87. The slope of the common tangent to the curve $y^2 = 12x$ and hyperbola $4xy + 9 = 0$ is

1)-1 2) $\sqrt{3}$ 3)1 4)not defined

88. The locus of point of intersection of two tangents of the hyperbola $\frac{x^2}{9} - \frac{y^2}{4} = 1$, the product of whose slopes is 4 is

1)a circle of radius 13 2)an ellipse with eccentricity $\frac{2\sqrt{2}}{3}$

3)a hyperbola with eccentricity $\sqrt{5}$ 4)a hyperbola with eccentricity $2\sqrt{5}$

89. If the curve $\frac{x^2}{a^2} + \frac{y^2}{\lambda^2 a^2} = 1$ and $(x-g)^2 + (y-f)^2 = r^2$ intersect orthogonally at $P(a\cos\theta, \lambda a \sin\theta)$, then

1) $\cot\frac{\theta}{2} = \frac{\lambda g}{f} if\ a = g$ 2) $\cot\frac{\theta}{2} = \frac{\lambda f}{g} if\ a = g$

3) $\cot\frac{\theta}{2} = \frac{\lambda g}{f} if\ a = f$ 4) $\tan\frac{\theta}{2} = \frac{\lambda g}{f} if\ a = f$

90. An equilateral triangle PQR is inscribed in a rectangular hyperbola $xy = 36$. If its incentre lies on the line y=6 then its circum centre is

1) $(-6,6)$ 2) $(6,6)$ 3) $(2,18)$ 4) $(22,3)$