Assignment

Definition of the Ellipse

Basic Level

1. If a bar of given length moves with its extremities on two fixed straight lines at right angles, then the locus of any point on bar marked on the bar describes a/an **[Orissa JEE 2003]**

(a) Circle (b) Parabola (c) Ellipse (d) Hyperbola

2. If the eccentricity of an ellipse becomes zero, then it takes the form of

(a) A circle (b) A parabola (c) A straight line (d) None of these

3. The locus of a variable point whose distance from $(-2,0)$ is $\frac{2}{3}$ times its distance from the line $x = -\frac{9}{2}$, is **[IIT Screening 1994]**

(a) Ellipse (b) Parabola (c) Hyperbola (d) None of these

4. If *A* and *B* are two fixed points and *P* is a variable point such that $PA + PB = 4$, where $AB < 4$, then the locus of *P* is

(a) A parabola (b) An ellipse (c) A hyperbola (d) None of these

5. Equation of the ellipse whose focus is $(6,7)$ directrix is $x + y + 2 = 0$ and $e = 1/\sqrt{3}$ is

(a) $5x^2 + 2xy + 5y^2 - 76x - 88y + 506 = 0$ (b) $5x^2 - 2xy + 5y^2 - 76x - 88y + 506 = 0$

(c) $5x^2 - 2xy + 5y^2 + 76x + 88y - 506 = 0$ (d) None of these

6. The locus of the centre of the circle $x^2 + y^2 + 4x\cos\theta - 2y\sin\theta - 10 = 0$ is

(a) An ellipse (b) A circle (c) A hyperbola (d) A parabola

Standard and other forms of an Ellipse, Terms related to an Ellipse

Basic Level

7. The equation $2x^2 + 3y^2 = 30$ represents **[MP PET 1988]**

(a) A circle (b) An ellipse (c) A hyperbola (d) A parabola

8. The equation $\frac{x^2}{2-r} + \frac{y^2}{r-5} + 1 = 0$ represents an ellipse, if **[MP PET 1995]**

(a) $r > 2$ (b) $2 < r < 5$ (c) $r > 5$ (d) None of these

9. Equation of the ellipse with eccentricity $\frac{1}{2}$ and foci at $(\pm 1, 0)$ is **[MP PET 2002]**

(a) $\frac{x^2}{3} + \frac{y^2}{4} = 1$ (b) $\frac{x^2}{4} + \frac{y^2}{3} = 1$ (c) $\frac{x^2}{4} + \frac{y^2}{3} = \frac{4}{3}$ (d) None of these

10. The equation of the ellipse whose foci are $(\pm 5, 0)$ and one of its directrix is $5x = 36$, is

(a) $\frac{x^2}{36} + \frac{y^2}{11} = 1$ (b) $\frac{x^2}{6} + \frac{y^2}{\sqrt{11}} = 1$ (c) $\frac{x^2}{6} + \frac{y^2}{11} = 1$ (d) None of these

11. The equation of ellipse whose distance between the foci is equal to 8 and distance between the directrix is 18, is

(a) $5x^2 - 9y^2 = 180$ (b) $9x^2 + 5y^2 = 180$ (c) $x^2 + 9y^2 = 180$ (d) $5x^2 + 9y^2 = 180$

12. The equation of the ellipse whose one of the vertices is $(0, 7)$ and the corresponding directrix is $y = 12$, is

(a) $95x^2 + 144y^2 = 4655$ (b) $144x^2 + 95y^2 = 4655$ (c) $95x^2 + 144y^2 = 13680$ (d) None of these

13. The equation of the ellipse whose centre is at origin and which passes through the points $(-3, 1)$ and $(2, -2)$ is

(a) $5x^2 + 3y^2 = 32$ (b) $3x^2 + 5y^2 = 32$ (c) $5x^2 - 3y^2 = 32$ (d) $3x^2 + 5y^2 + 32 = 0$

14. An ellipse passes through the point $(-3, 1)$ and its eccentricity is $\sqrt{\frac{2}{5}}$. The equation of the ellipse is

(a) $3x^2 + 5y^2 = 32$ (b) $3x^2 + 5y^2 = 25$ (c) $3x^2 + y^2 = 4$ (d) $3x^2 + y^2 = 9$

15. If the centre, one of the foci and semi- major axis of an ellipse be (0, 0), (0, 3) and 5 then its equation is **[AMU 1981]**

(a) $\frac{x^2}{16} + \frac{y^2}{25} = 1$ (b) $\frac{x^2}{25} + \frac{y^2}{16} = 1$ (c) $\frac{x^2}{9} + \frac{y^2}{25} = 1$ (d) None of these

16. The equation of the ellipse whose latus rectum is 8 and whose eccentricity is $\frac{1}{\sqrt{2}}$, referred to the principal axes of coordinates, is **[MP PET 1993]**

(a) $\frac{x^2}{18} + \frac{y^2}{32} = 1$ (b) $\frac{x^2}{8} + \frac{y^2}{9} = 1$ (c) $\frac{x^2}{64} + \frac{y^2}{32} = 1$ (d) $\frac{x^2}{16} + \frac{y^2}{24} = 1$

17. The lengths of major and minor axes of an ellipse are 10 and 8 respectively and its major axis is along the *y*-axis. The equation of the ellipse referred to its centre as origin is

(a) $\frac{x^2}{25} + \frac{y^2}{16} = 1$ (b) $\frac{x^2}{16} + \frac{y^2}{25} = 1$ (c) $\frac{x^2}{100} + \frac{y^2}{64} = 1$ (d) $\frac{x^2}{64} + \frac{y^2}{100} = 1$

18. The equation of the ellipse whose vertices are $(\pm 5, 0)$ and foci are $(\pm 4, 0)$ is

(a) $9x^2 + 25y^2 = 225$ (b) $25x^2 + 9y^2 = 225$ (c) $3x^2 + 4y^2 = 192$ (d) None of these

19. The latus rectum of an ellipse is 10 and the minor axis is equal to the distance between the foci. The equation of the ellipse is

(a) $x^2 + 2y^2 = 100$ (b) $x^2 + \sqrt{2}y^2 = 10$ (c) $x^2 - 2y^2 = 100$ (d) None of these

20. The eccentricity of the ellipse $4x^2 + 9y^2 = 36$, is **[MP PET 2000]**

(a) $\frac{1}{2\sqrt{3}}$ (b) $\frac{1}{\sqrt{3}}$ (c) $\frac{\sqrt{5}}{3}$ (d) $\frac{\sqrt{5}}{6}$

21. Eccentricity of the conic $16x^2 + 7y^2 = 112$ is **[MNR 1981]**

(a) $\frac{3}{\sqrt{7}}$ (b) $\frac{7}{16}$ (c) $\frac{3}{4}$ (d) $\frac{4}{3}$

22. Eccentricity of the ellipse $9x^2 + 25y^2 = 225$ is **[Kerala (Engg.) 2002]**

(a) $\frac{3}{5}$ (b) $\frac{4}{5}$ (c) $\frac{9}{25}$ (d) $\frac{\sqrt{34}}{5}$

23. The eccentricity of the ellipse $25x^2 + 16y^2 = 400$ is **[MP PET 2001]**

(a) $\frac{3}{5}$ (b) $\frac{1}{3}$ (c) $\frac{2}{5}$ (d) $\frac{1}{5}$

24. For the ellipse $\frac{x^2}{64} + \frac{y^2}{28} = 1$, the eccentricity is **[MNR 1974]**

(a) $\frac{3}{4}$ (b) $\frac{4}{3}$ (c) $\frac{2}{\sqrt{7}}$ (d) $\frac{1}{3}$

25. If the latus rectum of an ellipse be equal to half of its minor axis, then its eccentricity is **[MP PET 1991, 1997; Karnataka CET 2000]**

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

26. If the length of the major axis of an ellipse is three times the length of its minor axis, then its eccentricity is **[EAMCET 1990]**

(a) $\frac{1}{3}$ (b) $\frac{1}{\sqrt{3}}$ (c) $\frac{1}{\sqrt{2}}$ (d) $\frac{2\sqrt{2}}{3}$

27. The length of the latus rectum of an ellipse is $\frac{1}{3}$ of the major axis. Its eccentricity is **[EMACET 1991]**

(a) $\frac{2}{3}$ (b) $\sqrt{\frac{2}{3}}$ (c) $\frac{5\times4\times3}{7^3}$ (d) $\left(\frac{3}{4}\right)^4$

28. Eccentricity of the ellipse whose latus rectum is equal to the distance between two focus points, is

(a) $\frac{\sqrt{5}+1}{2}$ (b) $\frac{\sqrt{5}-1}{2}$ (c) $\frac{\sqrt{5}}{2}$ (d) $\frac{\sqrt{3}}{2}$

29. If the distance between the foci of an ellipse be equal to its minor axis, then its eccentricity is

(a) $\frac{1}{2}$ (b) $\frac{1}{\sqrt{2}}$ (c) $\frac{1}{3}$ (d) $\frac{1}{\sqrt{3}}$

30. The length of the latus rectum of the ellipse $\frac{x^2}{36}+\frac{y^2}{49}=1$ is **[Karnataka CET 1993]**

(a) $\frac{98}{6}$ (b) $\frac{72}{7}$ (c) $\frac{72}{14}$ (d) $\frac{98}{12}$

31. For the ellipse $3x^2+4y^2=12$, the length of latus rectum is **[MNR 1973]**

(a) $\frac{3}{2}$ (b) 3 (c) $\frac{8}{3}$ (d) $\sqrt{\frac{3}{2}}$

32. The length of the latus rectum of the ellipse $9x^2+4y^2=1$, is **[MP PET 1999]**

(a) $\frac{3}{2}$ (b) $\frac{8}{3}$ (c) $\frac{4}{9}$ (d) $\frac{8}{9}$

33. In an ellipse, minor axis is 8 and eccentricity is $\frac{\sqrt{5}}{3}$. Then major axis is **[Karnataka CET 2002]**

(a) 6 (b) 12 (c) 10 (d) 16

34. The distance between the foci of an ellipse is 16 and eccentricity is $\frac{1}{2}$. Length of the major axis of the ellipse is **[Karnataka CET 2001]**

(a) 8 (b) 64 (c) 16 (d) 32

35. If the eccentricity of an ellipse be $1/\sqrt{2}$, then its latus rectum is equal to its

(a) Minor axis (b) Semi-minor axis (c) Major axis (d) Semi-major axis

36. If the distance between a focus and corresponding directrix of an ellipse be 8 and the eccentricity be $1/2$, then the length of the minor axis is

(a) 3 (b) $4\sqrt{2}$ (c) 6 (d) None of these

37. The sum of focal distances of any point on the ellipse with major and minor axes as $2a$ and $2b$ respectively, is equal to **[MP PET 2003]**

(a) $2a$ (b) $2\frac{a}{b}$ (c) $2\frac{b}{a}$ (d) $\frac{b^2}{a}$

38. P is any point on the ellipse $9x^2+36y^2=324$ whose foci are S and S'. Then $SP+S'P$ equals **[DCE 1999]**

(a) 3 (b) 12 (c) 36 (d) 324

39. The foci of $16x^2 + 25y^2 = 400$ are **[BIT Ranchi 1996]**

(a) $(\pm 3, 0)$ (b) $(0, \pm 3)$ (c) $(3, -3)$ (d) $(-3, 3)$

40. In an ellipse $9x^2 + 5y^2 = 45$, the distance between the foci is **[Karnataka CET 2002]**

(a) $4\sqrt{5}$ (b) $3\sqrt{5}$ (c) 3 (d) 4

41. The distance between the directrices of the ellipse $\frac{x^2}{36} + \frac{y^2}{20} = 1$ is

(a) 8 (b) 12 (c) 18 (d) 24

42. If the eccentricity of the two ellipse $\frac{x^2}{169} + \frac{y^2}{25} = 1$, and $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$ are equal, then the value of a/b is **[UPSEAT 2001]**

(a) $\frac{5}{13}$ (b) $\frac{6}{13}$ (c) $\frac{13}{5}$ (d) $\frac{13}{6}$

43. The equation of the ellipse whose one focus is at (4, 0) and whose eccentricity is 4/5, is **[Karnataka CET 1993]**

(a) $\frac{x^2}{3^2} + \frac{y^2}{5^2} = 1$ (b) $\frac{x^2}{5^2} + \frac{y^2}{3^2} = 1$ (c) $\frac{x^2}{5^2} + \frac{y^2}{4^2} = 1$ (d) $\frac{x^2}{4^2} + \frac{y^2}{5^2} = 1$

44. S and T are the foci of an ellipse and B is an end of the minor axis. If STB is an equilateral triangle, the eccentricity of the ellipse is **[EMACET 1992; DCE 1995]**

(a) $\frac{1}{4}$ (b) $\frac{1}{3}$ (c) $\frac{1}{2}$ (d) $\frac{2}{3}$

45. If C is the centre of the ellipse $9x^2 + 16y^2 = 144$ and S is one focus, the ratio of CS to semi-major axis, is

(a) $\sqrt{7} : 16$ (b) $\sqrt{7} : 4$ (c) $\sqrt{5} : \sqrt{7}$ (d) None of these

46. If $L.R. = 10$, distance between foci = length of minor axis, then equation of ellipse is

(a) $\frac{x^2}{50} + \frac{y^2}{100} = 1$ (b) $\frac{x^2}{100} + \frac{y^2}{50} = 1$ (c) $\frac{x^2}{50} + \frac{y^2}{20} = 1$ (d) None of these

47. Line joining foci subtends an angle of 90° at an extremity of minor axis, then eccentricity is

(a) $\frac{1}{\sqrt{6}}$ (b) $\frac{1}{\sqrt{3}}$ (c) $\frac{1}{\sqrt{2}}$ (d) None of these

48. If foci are points $(0, 1), (0, -1)$ and minor axis is of length 1, then equation of ellipse is

(a) $\frac{x^2}{1/4} + \frac{y^2}{5/4} = 1$ (b) $\frac{x^2}{5/4} + \frac{y^2}{1/4} = 1$ (c) $\frac{x^2}{3/4} + \frac{y^2}{1/4} = 1$ (d) $\frac{x^2}{1/4} + \frac{y^2}{3/4} = 1$

49. The eccentricity of the ellipse $5x^2 + 9y^2 = 1$ is **[EMACET 2000]**

(a) $\frac{2}{3}$ (b) $\frac{3}{4}$ (c) $\frac{4}{5}$ (d) $\frac{1}{2}$

50. For the ellipse $x^2 + 4y^2 = 9$ **[Roorkee 1999]**

(a) The eccentricity is $\frac{1}{2}$ (b) The latus rectum is $\frac{2}{3}$ (c) A focus is $(3\sqrt{3}, 0)$ (d) A directrix is $x = 2\sqrt{3}$

51. The sum of the distances of any point on the ellipse $3x^2 + 4y^2 = 24$ from its foci is **[Kerala (Engg.) 2001]**

(a) $8\sqrt{2}$ (b) $4\sqrt{2}$ (c) $16\sqrt{2}$ (d) None of these

52. The sum of the focal distances from any point on the ellipse $9x^2 + 16y^2 = 144$ is **[Roorkee 1997; Pb.CET 2002]**

(a) 32 (b) 18 (c) 16 (d) 8

53. The distance of a focus of the ellipse $9x^2+16y^2=144$ from an end of the minor axis is

(a) $\frac{3}{2}$ (b) 3 (c) 4 (d) None of these

54. The equation of ellipse in the form $\frac{x^2}{a^2}+\frac{y^2}{b^2}=1$, given the eccentricity to be $\frac{2}{3}$ and latus rectum $\frac{2}{3}$ is **[BIT Ranchi 1998]**

(a) $25x^2+45y^2=9$ (b) $25x^2-4y^2=9$ (c) $25x^2-45y^2=9$ (d) $25x^2+4y^2=1$

55. The equation of the ellipse with axes along the *x*-axis and the *y*-axis, which passes through the points *P* (4, 3) and *Q* (6, 2) is

(a) $\frac{x^2}{50}+\frac{y^2}{13}=1$ (b) $\frac{x^2}{52}+\frac{y^2}{13}=1$ (c) $\frac{x^2}{13}+\frac{y^2}{52}=1$ (d) $\frac{x^2}{52}+\frac{y^2}{17}=1$

56. *P* is a variable point on the ellipse $\frac{x^2}{a^2}+\frac{y^2}{b^2}=1$ with *AA*' as the major axis. Then the maximum value of the area of the triangle *APA*' is

(a) *ab* (b) 2*ab* (c) $\frac{ab}{2}$ (d) None of these

57. The latus rectum of the ellipse $x^2\tan^2\alpha+y^2\sec^2\alpha=1$ is 1/2 then $\alpha(0<\alpha<\pi)$ is equal to

(a) $\pi/12$ (b) $\pi/6$ (c) $5\pi/12$ (d) None of these

Advance Level

58. An ellipse is described by using an endless string which is passed over two pins. If the axes are 6 *cm* and 4 *cm*, the necessary length of the string and the distance between the pins respectively in *cm*, are **[MNR 1989]**

(a) $6, 2\sqrt{5}$ (b) $6, \sqrt{5}$ (c) $4, 2\sqrt{5}$ (d) None of these

59. A man running round a race-course notes that the sum of the distances of two flag-posts from him is always 10 *meters* and the distance between the flag-posts is 8 *meters*. The area of the path he encloses in square metres is **[MNR 1991; UPSEAT 2000]**

(a) 15π (b) 12π (c) 18π (d) 8π

60. The equation $\frac{x^2}{1-r}-\frac{y^2}{1+r}=1$, $r>1$ represents **[IIT 1981]**

(a) An ellipse (b) A hyperbola (c) A circle (d) An imaginary ellipse

61. The radius of the circle having its centre at (0,3) and passing through the foci of the ellipse $\frac{x^2}{16}+\frac{y^2}{9}=1$, is **[IIT 1995]**

(a) 3 (b) 3.5 (c) 4 (d) $\sqrt{12}$

62. The centre of an ellipse is *C* and *PN* is any ordinate and A, A' are the end points of major axis, then the value of $\frac{PN^2}{AN.A'N}$ is

(a) $\frac{b^2}{a^2}$ (b) $\frac{a^2}{b^2}$ (c) a^2+b^2 (d) 1

63. Let *P* be a variable point on the ellipse $\frac{x^2}{25}+\frac{y^2}{16}=1$ with foci at *S* and S'. If *A* be the area of triangle PSS', then the maximum value of *A* is

(a) 24 sq. units (b) 12 sq. units (c) 36 sq. units (d) None of these

64. The eccentricity of the ellipse which meets the straight line $\frac{x}{7}+\frac{y}{2}=1$ on the axis of *x* and the straight line $\frac{x}{3}-\frac{y}{5}=1$ on the axis of *y* and whose axes lie along the axes of coordinates, is

(a) $\frac{3\sqrt{2}}{7}$ (b) $\frac{2\sqrt{6}}{7}$ (c) $\frac{\sqrt{3}}{7}$ (d) None of these

65. If the focal distance of an end of the minor axis of an ellipse (referred to its axes as the axes of x and y respectively) is k and the distance between its foci is $2h$, then its equation is

(a) $\frac{x^2}{k^2}+\frac{y^2}{h^2}=1$ (b) $\frac{x^2}{k^2}+\frac{y^2}{k^2-h^2}=1$ (c) $\frac{x^2}{k^2}+\frac{y^2}{h^2-k^2}=1$ (d) $\frac{x^2}{k^2}+\frac{y^2}{k^2+h^2}=1$

66. If (5, 12) and (24, 7) are the foci of a conic passing through the origin, then the eccentricity of conic is

(a) $\frac{\sqrt{386}}{38}$ (b) $\frac{\sqrt{386}}{12}$ (c) $\frac{\sqrt{386}}{13}$ (d) $\frac{\sqrt{386}}{25}$

67. The maximum area of an isosceles triangle inscribed in the ellipse $\frac{x^2}{a^2}+\frac{y^2}{b^2}=1$ with the vertex at one end of the major axis is

[Roorkee 1994, Him. CET 2002]

(a) $\sqrt{3}ab$ (b) $\frac{3\sqrt{3}}{4}ab$ (c) $\frac{5\sqrt{3}}{4}ab$ (d) None of these

68. The radius of the circle passing through the foci of the ellipse $\frac{x^2}{16}+\frac{y^2}{9}=1$ and having its centre (0, 3) is **[IIT 1995]**

(a) 4 (b) 3 (c) $\sqrt{12}$ (d) $\frac{7}{2}$

69. The locus of extremities of the latus rectum of the family of ellipse $b^2x^2+y^2=a^2b^2$ is

(a) $x^2-ay=a^2$ (b) $x^2-ay=b^2$ (c) $x^2+ay=a^2$ (d) $x^2+ay=b^2$

Special form of an Ellipse, Parametric equation of an Ellipse

Basic Level

70. The equation of the ellipse whose centre is (2,–3), one of the foci is (3, –3) and the corresponding vertex is (4, –3) is

(a) $\frac{(x-2)^2}{3}+\frac{(y+3)^2}{4}=1$ (b) $\frac{(x-2)^2}{4}+\frac{(y+3)^2}{3}=1$ (c) $\frac{x^2}{3}+\frac{y^2}{4}=1$ (d) None of these

71. The equation of an ellipse, whose vertices are (2, –2), (2, 4) and eccentricity $\frac{1}{3}$, is **[Karnataka CET 1999]**

(a) $\frac{(x-2)^2}{9}+\frac{(y-1)^2}{8}=1$ (b) $\frac{(x-2)^2}{8}+\frac{(y-1)^2}{9}=1$ (c) $\frac{(x+2)^2}{8}+\frac{(y+1)^2}{9}=1$ (d) $\frac{(x-2)^2}{9}+\frac{(y+1)^2}{8}=1$

72. The equation of an ellipse whose eccentricity 1/2 is and the vertices are (4, 0) and (10, 0) is

(a) $3x^2+4y^2-42x+120=0$ (b) $3x^2+4y^2+42x+120=0$

(c) $3x^2+4y^2+42x-120=0$ (d) $3x^2+4y^2-42x-120=0$

73. For the ellipse $3x^2+4y^2-6x+8y-5=0$ **[BTT Ranchi 2000]**

(a) Centre is (2, –1) (b) Eccentricity is $\frac{1}{3}$

(c) Foci are(3, 1) and (–1, 1) (d) Centre is (1, –1), $e=\frac{1}{2}$, foci are (3, –1) and (–1, –1)

74. The eccentricity of the ellipse $9x^2+5y^2-18x-2y-16=0$ **[EAMCET 2003]**

(a) 1/2 (b) 2/3 (c) 1/3 (d) 3/4

75. The eccentricity of the ellipse $\frac{(x-1)^2}{9}+\frac{(y+1)^2}{25}=1$ is **[AMU 1999]**

(a) 4/5 (b) 3/5 (c) 5/4 (d) Imaginary

76. The eccentricity of the ellipse $9x^2+5y^2-30y=0$, is **[MNR 1993]**

(a) $\frac{1}{3}$ (b) $\frac{2}{3}$ (c) $\frac{3}{4}$ (d) None of these

77. The eccentricity of the ellipse $4x^2+9y^2+8x+36y+4=0$ is **[MP PET 1996]**

(a) $\frac{5}{6}$ (b) $\frac{3}{5}$ (c) $\frac{\sqrt{2}}{3}$ (d) $\frac{\sqrt{5}}{3}$

78. The eccentricity of the curve represented by the equation $x^2+2y^2-2x+3y+2=0$ is **[Roorkee 1998]**

(a) 0 (b) 1/2 (c) $1/\sqrt{2}$ (d) $\sqrt{2}$

79. The centre of the ellipse $\frac{(x+y-2)^2}{9}+\frac{(x-y)^2}{16}=1$, is **[EAMCET 1994]**

(a) (0, 0) (b) (1, 1) (c) (1, 0) (d) (0, 1)

80. The centre of the ellipse $4x^2+9y^2-16x-54y+61=0$ is **[MP PET 1992]**

(a) (1, 3) (b) (2, 3) (c) (3, 2) (d) (3, 1)

81. Latus rectum of ellipse $4x^2+9y^2-8x-36y+4=0$ is **[MP PET 1989]**

(a) 8 / 3 (b) 4 / 3 (c) $\frac{\sqrt{5}}{3}$ (d) 16 / 3

82. The length of the axes of the conic $9x^2+4y^2-6x+4y+1=0$, are **[Orissa JEE 2002]**

(a) $\frac{1}{2}, 9$ (b) $3, \frac{2}{5}$ (c) $1, \frac{2}{3}$ (d) 3, 2

83. Equations $x=a\cos\theta,\ y=b\sin\theta\,(a>b)$ represent a conic section whose eccentricity e is given by

(a) $e^2=\frac{a^2+b^2}{a^2}$ (b) $e^2=\frac{a^2+b^2}{b^2}$ (c) $e^2=\frac{a^2-b^2}{a^2}$ (d) $e^2=\frac{a^2-b^2}{b^2}$

84. The curve with parametric equations $x=1+4\cos\theta,\ y=2+3\sin\theta$ is

(a) An ellipse (b) A parabola (c) A hyperbola (d) A circle

85. The equations $x=a\cos\theta, y=b\sin\theta, 0\le\theta<2\pi, a\ne b$, represent

(a) An ellipse (b) A parabola (c) A circle (d) A hyperbola

86. The curve represented by $x=2(\cos t+\sin t), y=5(\cos t-\sin t)$ is **[EAMCET 2000]**

(a) A circle (b) A parabola (c) An ellipse (d) A hyperbola

87. The equations $x=a\left(\frac{1-t^2}{1+t^2}\right),\ y=\frac{2bt}{1+t^2}; t\in R$ represent

(a) A circle (b) An ellipse (c) A parabola (d) A hyperbola

88. The eccentricity of the ellipse represented by $25x^2+16y^2-150x-175=0$ is **[JMIEE 2000]**

(a) $\frac{2}{5}$ (b) $\frac{3}{5}$ (c) $\frac{4}{5}$ (d) None of these

89. The set of values of a for which $(13x-1)^2+(13y-2)^2=a(5x+12y-1)^2$ represents an ellipse is

(a) $1<a<2$ (b) $0<a<1$ (c) $2<a<3$ (d) None of these

Advance Level

90. The parametric representation of a point on the ellipse whose foci are (–1, 0) and (7, 0) and eccentricity 1/2 is

(a) $(3+8\cos\theta, 4\sqrt{3}\sin\theta)$ (b) $(8\cos\theta, 4\sqrt{3}\sin\theta)$ (c) $(3+4\sqrt{3}\cos\theta, 8\sin\theta)$ (d) None of these

91. If $P(\theta)$ and $Q\left(\frac{\pi}{2}+\theta\right)$ are two points on the ellipse $\frac{x^2}{a^2}+\frac{y^2}{b^2}=1$, then locus of the mid-point of PQ is

(a) $\frac{x^2}{a^2}+\frac{y^2}{b^2}=\frac{1}{2}$ (b) $\frac{x^2}{a^2}+\frac{y^2}{b^2}=4$ (c) $\frac{x^2}{a^2}+\frac{y^2}{b^2}=2$ (d) None of these

Position of a point, Tangents, Pair of tangents, and Director circle of an Ellipse

Basic Level

92. The line $lx+my-n=0$ will be a tangent to the ellipse $\frac{x^2}{a^2}+\frac{y^2}{b^2}=1$, if

(a) $a^2l^2+b^2m^2=n^2$ (b) $al^2+bm^2=n^2$ (c) $a^2l+b^2m=n$ (d) None of these

93. The line $x\cos\alpha+y\sin\alpha=p$ will be a tangent to the conic $\frac{x^2}{a^2}+\frac{y^2}{b^2}=1$, if **[Roorkee 1978]**

(a) $p^2=a^2\sin^2\alpha+b^2\cos^2\alpha$ (b) $p^2=a^2+b^2$

(c) $p^2=b^2\sin^2\alpha+a^2\cos^2\alpha$ (d) None of these

94. The equations of the tangents of the ellipse $9x^2+16y^2=144$, which passes through the point (2, 3) is **[MP PET 1996]**

(a) $y=3, x+y=5$ (b) $y=-3, x-y=5$ (c) $y=4, x+y=3$ (d) $y=-4, x-y=3$

95. The equation of the tangent to the conic $x^2-y^2-8x+2y+11=0$ at (2, 1) is **[Karnataka CET 1993]**

(a) $x+2=0$ (b) $2x+1=0$ (c) $x-2=0$ (d) $x+y+1=0$

96. The position of the point (1, 3) with respect to the ellipse $4x^2+9y^2-16x-54y+61=0$ is **[MP PET 1991]**

(a) Outside the ellipse (b) On the ellipse (c) On the major axis (d) On the minor axis

97. The ellipse $\frac{x^2}{a^2}+\frac{y^2}{b^2}=1$ and the straight line $y=mx+c$ intersect in real points only if **[MNR 1984, 1995]**

(a) $a^2m^2<c^2-b^2$ (b) $a^2m^2>c^2-b^2$ (c) $a^2m^2\geq c^2-b^2$ (d) $c\geq b$

98. If the line $y=mx+c$ touches the ellipse $\frac{x^2}{b^2}+\frac{y^2}{a^2}=1$, then c= **[MNR 1975; MP PET 1994,95,99]**

(a) $\pm\sqrt{b^2m^2+a^2}$ (b) $\pm\sqrt{a^2m^2+b^2}$ (c) $\pm\sqrt{b^2m^2-a^2}$ (d) $\pm\sqrt{a^2m^2-b^2}$

99. If the line $y=2x+c$ be a tangent to the ellipse $\frac{x^2}{8}+\frac{y^2}{4}=1$, then c= **[MNR 1979; DCE 2000]**

(a) ±4 (b) ±6 (c) ±1 (d) ±8

100. The equation of the tangent to the ellipse $x^2+16y^2=16$ making an angle of 60^o with x-axis

(a) $\sqrt{3}x-y+7=0$ (b) $\sqrt{3}x-y-7=0$ (c) $\sqrt{3}x-y\pm7=0$ (d) None of these

101. The position of the point (4, –3) with respect to the ellipse $2x^2+5y^2=20$ is

(a) Outside the ellipse (b) On the ellipse (c) On the major axis (d) None of these

102. The angle between the pair of tangents drawn to the ellipse $3x^2+2y^2=5$ from the point (1, 2) is **[MNR 1984]**

(a) $\tan^{-1}\left(\frac{12}{5}\right)$ (b) $\tan^{-1}(6\sqrt{5})$ (c) $\tan^{-1}\left(\frac{12}{\sqrt{5}}\right)$ (d) $\tan^{-1}(12\sqrt{5})$

103. If any tangent to the ellipse $\frac{x^2}{a^2}+\frac{y^2}{b^2}=1$ cuts off intercepts of length h and k on the axes, then $\frac{a^2}{h^2}+\frac{b^2}{k^2}=$

(a) 0 (b) 1 (c) –1 (d) None of these

104. The equation of the tangents drawn at the ends of the major axis of the ellipse $9x^2+5y^2-30y=0$, are **[MP PET 1999]**

(a) $y=\pm 3$ (b) $x=\pm\sqrt{5}$ (c) $y=0, y=6$ (d) None of these

105. The locus of the point of intersection of mutually perpendicular tangent to the ellipse $\frac{x^2}{a^2}+\frac{y^2}{b^2}=1$, is **[MP PET 1995]**

(a) A straight line (b) A parabola (c) A circle (d) None of these

106. Two perpendicular tangents drawn to the ellipse $\frac{x^2}{25}+\frac{y^2}{16}=1$ intersect on the curve

(a) $x=\frac{a}{e}$ (b) $x^2+y^2=41$ (c) $x^2+y^2=9$ (d) $x^2-y^2=41$

107. The product of the perpendiculars drawn from the two foci of an ellipse to the tangent at any point of the ellipse is **[EAMCAT 2000]**

(a) a^2 (b) b^2 (c) $4a^2$ (d) $4b^2$

108. The equations of the tangents to the ellipse $4x^2+3y^2=5$, which are inclined at 60^o to the axis of x are

(a) $y=\sqrt{3}x\pm\sqrt{\frac{65}{12}}$ (b) $y=\sqrt{3}x\pm\sqrt{\frac{12}{65}}$ (c) $y=\frac{x}{\sqrt{3}}\pm\sqrt{\frac{65}{12}}$ (d) None of these

109. If the straight line $y=4x+c$ is a tangent to the ellipse $\frac{x^2}{8}+\frac{y^2}{4}=1$, then c will be equal to

(a) ± 4 (b) ± 6 (c) ± 1 (d) $\pm\sqrt{(132)}$

110. Tangents are drawn to the ellipse $3x^2+5y^2=32$ and $25x^2+9y^2=450$ passing through the point (3, 5). The number of such tangents are

(a) 2 (b) 3 (c) 4 (d) 0

111. If $\frac{x}{a}+\frac{y}{b}=\sqrt{2}$ touches the ellipse $\frac{x^2}{a^2}+\frac{y^2}{b^2}=1$, then its eccentric angle θ is equal to **[EAMCET 1995]**

(a) 0^o (b) 90^o (c) 45^o (d) 60^o

112. Locus of point of intersection of tangents at $(a\cos\alpha, b\sin\alpha)$ and $(a\cos\beta, b\sin\beta)$ for the ellipse $\frac{x^2}{a^2}+\frac{y^2}{b^2}=1$ is **[IIIT Allahabad 2001]**

(a) A circle (b) A straight line (c) An ellipse (d) A parabola

113. The equation of the tangent at the point $(1/4, 1/4)$ of the ellipse $\frac{x^2}{4}+\frac{y^2}{12}=1$ is

(a) $3x+y=48$ (b) $3x+y=3$ (c) $3x+y=16$ (d) None of these

114. If F_1 and F_2 be the feet of the perpendiculars from the foci S_1 and S_2 of an ellipse $\frac{x^2}{5}+\frac{y^2}{3}=1$ on the tangent at any point P on the ellipse, then $(S_1F_1)(S_2F_2)$ is equal to

(a) 2 (b) 3 (c) 4 (d) 5

115. Equations of tangents to the ellipse $\frac{x^2}{9}+\frac{y^2}{4}=1$, which cut off equal intercepts on the axes is

(a) $y=x+\sqrt{13}$ (b) $y=-x+\sqrt{13}$ (c) $y=x-\sqrt{13}$ (d) $y=-x-\sqrt{13}$

116. The line $x = at^2$ meets the ellipse $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$ in the real points , if

(a) $|t| < 2$ (b) $|t| \le 1$ (c) $|t| > 1$ (d) None of these

Advance Level

117. The locus of mid points of parts in between axes and tangents of ellipse $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$ will be **[UPSEAT 1999]**

(a) $\frac{a^2}{x^2} + \frac{b^2}{y^2} = 1$ (b) $\frac{a^2}{x^2} + \frac{b^2}{y^2} = 2$ (c) $\frac{a^2}{x^2} + \frac{b^2}{y^2} = 3$ (d) $\frac{a^2}{x^2} + \frac{b^2}{y^2} = 4$

118. The angle of intersection of ellipse $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$ and circle $x^2 + y^2 = ab$, is

(a) $\tan^{-1}\left(\frac{a-b}{ab}\right)$ (b) $\tan^{-1}\left(\frac{a+b}{ab}\right)$ (c) $\tan^{-1}\left(\frac{a+b}{\sqrt{ab}}\right)$ (d) $\tan^{-1}\left(\frac{a-b}{\sqrt{ab}}\right)$

119. Locus of the foot of the perpendicular drawn from the centre upon any tangent to the ellipse $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$, is

(a) $(x^2 + y^2)^2 = b^2x^2 + a^2y^2$ (b) $(x^2 + y^2)^2 = b^2x^2 - a^2y^2$

(c) $(x^2 + y^2)^2 = a^2x^2 - b^2y^2$ (d) $(x^2 + y^2)^2 = a^2x^2 + b^2y^2$

120. If a tangent having slope of $-\frac{4}{3}$ to the ellipse $\frac{x^2}{18} + \frac{y^2}{32} = 1$ intersects the major and minor axes in points *A* and *B* respectively, then the area of ΔOAB is equal to (*O* is centre of the ellipse)

(a) 12 sq. units (b) 48 sq. units (c) 64 sq. units (d) 24 sq. units

121. Tangent is drawn to ellipse $\frac{x^2}{27} + y^2 = 1$ at $(3\sqrt{3}\cos\theta, \sin\theta)$(where $\theta \in \left(0, \frac{\pi}{2}\right)$). Then the value of θ such that sum of intercepts on axes made by this tangent is minimum, is **[IIT Screening 2003]**

(a) $\pi/3$ (b) $\pi/6$ (c) $\pi/8$ (d) $\pi/4$

122. If the tangent at the point $\left(4\cos\phi, \frac{16}{\sqrt{11}}\sin\phi\right)$ to the ellipse $16x^2 + 11y^2 = 256$ is also a tangent to the circle $x^2 + y^2 - 2x = 15$, then the value of ϕ is

(a) $\pm\frac{\pi}{2}$ (b) $\pm\frac{\pi}{4}$ (c) $\pm\frac{\pi}{3}$ (d) $\pm\frac{\pi}{6}$

123. An ellipse passes through the point (4, –1) and its axes are along the axes of co-ordinates. If the line $x + 4y - 10 = 0$ is a tangent to it, then its equation is

(a) $\frac{x^2}{100} + \frac{y^2}{5} = 1$ (b) $\frac{x^2}{80} + \frac{y^2}{5/4} = 1$ (c) $\frac{x^2}{20} + \frac{y^2}{5} = 1$ (d) None of these

124. The sum of the squares of the perpendiculars on any tangent to the ellipse $x^2/a^2 + y^2/b^2 = 1$ from two points on the minor axis each distance $\sqrt{a^2 - b^2}$ from the centre is

(a) a^2 (b) b^2 (c) $2a^2$ (d) $2b^2$

125. The tangent at a point $P(a\cos\theta, b\sin\theta)$ of an ellipse $x^2/a^2 + y^2/b^2 = 1$, meets its auxiliary circle in two points, the chord joining which subtends a right angle at the centre, then the eccentricity of the ellipse is

(a) $(1 + \sin^2\theta)^{-1}$ (b) $(1 + \sin^2\theta)^{-1/2}$ (c) $(1 + \sin^2\theta)^{-3/2}$ (d) $(1 + \sin^2\theta)^{-2}$

126. The locus of the point of intersection of tangents to an ellipse at two points, sum of whose eccentric angles is constant is

(a) A parabola (b) A circle (c) An ellipse (d) A straight line

127. The sum of the squares of the perpendiculars on any tangents to the ellipse $\frac{x^2}{a^2}+\frac{y^2}{b^2}=1$ from two points on the minor axis each at a distance *ae* from the centre is

(a) $2a^2$ (b) $2b^2$ (c) a^2+b^2 (d) a^2-b^2

128. The equation of the circle passing through the points of intersection of ellipse $\frac{x^2}{a^2}+\frac{y^2}{b^2}=1$ and $\frac{x^2}{b^2}+\frac{y^2}{a^2}=1$ is

(a) $x^2+y^2=a^2$ (b) $x^2+y^2=b^2$ (c) $x^2+y^2=\frac{a^2b^2}{a^2+b^2}$ (d) $x^2+y^2=\frac{2a^2b^2}{a^2+b^2}$

129. The slope of a common tangent to the ellipse $\frac{x^2}{a^2}+\frac{y^2}{b^2}=1$ and a concentric circle of radius *r* is

(a) $\tan^{-1}\sqrt{\frac{r^2-b^2}{a^2-r^2}}$ (b) $\sqrt{\frac{r^2-b^2}{a^2-r^2}}$ (c) $\left(\frac{r^2-b^2}{a^2-r^2}\right)$ (d) $\sqrt{\frac{a^2-r^2}{r^2-b^2}}$

130. The tangents from which of the following points to the ellipse $5x^2+4y^2=20$ are perpendicular

(a) $(1, 2\sqrt{2})$ (b) $(2\sqrt{2}, 1)$ (c) $(2, \sqrt{5})$ (d) $(\sqrt{5}, 2)$

Normals , Eccentric angles of the Co-normal points

Basic Level

131. The line $y=mx+c$ is a normal to the ellipse $\frac{x^2}{a^2}+\frac{y^2}{b^2}=1$, if $c=$

(a) $-(2am+bm^2)$ (b) $\frac{(a^2+b^2)m}{\sqrt{a^2+b^2m^2}}$ (c) $-\frac{(a^2-b^2)m}{\sqrt{a^2+b^2m^2}}$ (d) $\frac{(a^2-b^2)m}{\sqrt{a^2+b^2}}$

132. The line $lx+my+n=0$ is a normal to the ellipse $\frac{x^2}{a^2}+\frac{y^2}{b^2}=1$, if **[DCE 2000]**

(a) $\frac{a^2}{m^2}+\frac{b^2}{l^2}=\frac{(a^2-b^2)}{n^2}$ (b) $\frac{a^2}{l^2}+\frac{b^2}{m^2}=\frac{(a^2-b^2)^2}{n^2}$ (c) $\frac{a^2}{l^2}-\frac{b^2}{m^2}=\frac{(a^2-b^2)^2}{n^2}$ (d) None of these

133. If the line $x\cos\alpha+y\sin\alpha=p$ be a normal to the ellipse $\frac{x^2}{a^2}+\frac{y^2}{b^2}=1$, then **[MP PET 2001]**

(a) $p^2(a^2\cos^2\alpha+b^2\sin^2\alpha)=a^2-b^2$ (b) $p^2(a^2\cos^2\alpha+b^2\sin^2\alpha)=(a^2-b^2)^2$

(c) $p^2(a^2\sec^2\alpha+b^2\text{cosec}^2\alpha)=a^2-b^2$ (d) $p^2(a^2\sec^2\alpha+b^2\text{cosec}^2\alpha)=(a^2-b^2)^2$

134. The equation of the normal at the point (2, 3) on the ellipse $9x^2+16y^2=180$, is **[MP PET 2000]**

(a) $3y=8x-10$ (b) $3y-8x+7=0$ (c) $8y+3x+7=0$ (d) $3x+2y+7=0$

135. The eccentric angles of the extremities of latus-rectum of the ellipse $\frac{x^2}{a^2}+\frac{y^2}{b^2}=1$ are given by

(a) $\tan^{-1}\left(\pm\frac{ae}{b}\right)$ (b) $\tan^{-1}\left(\pm\frac{be}{a}\right)$ (c) $\tan^{-1}\left(\pm\frac{b}{ae}\right)$ (d) $\tan^{-1}\left(\pm\frac{a}{be}\right)$

136. The number of normals that can be drawn from a point to a given ellipse is

(a) 2 (b) 3 (c) 4 (d) 1

137. The eccentric angle of a point on the ellipse $\frac{x^2}{6}+\frac{y^2}{2}=1$, whose distances from the centre of the ellipse is 2, is

(a) $\frac{\pi}{4}$ (b) $\frac{3\pi}{2}$ (c) $\frac{5\pi}{3}$ (d) $\frac{7\pi}{6}$

Advance Level

138. If the normal at the point $P(\theta)$ to the ellipse $\frac{x^2}{14}+\frac{y^2}{5}=1$ intersects it again at the point $Q(2\theta)$, then $\cos\theta$ is equal to

(a) $\frac{2}{3}$ (b) $-\frac{2}{3}$ (c) $\frac{3}{2}$ (d) $-\frac{3}{2}$

139. If the normal at any point P on the ellipse $\frac{x^2}{a^2}+\frac{y^2}{b^2}=1$ meets the coordinates axes in G and g respectively, then $PG : Pg=$

(a) $a:b$ (b) $a^2:b^2$ (c) $b^2:a^2$ (d) $b:a$

140. If α and β are eccentric angles of the ends of a focal chord of the ellipse $\frac{x^2}{a^2}+\frac{y^2}{b^2}=1$, then $\tan\frac{\alpha}{2}\tan\frac{\beta}{2}$ is equal to

(a) $\frac{1-e}{1+e}$ (b) $\frac{e-1}{e+1}$ (c) $\frac{e+1}{e-1}$ (d) None of these

141. If the normal at one end of the latus-rectum of an ellipse $\frac{x^2}{a^2}+\frac{y^2}{b^2}=1$ passes through the one end of the minor axis, then

(a) $e^4-e^2+1=0$ (b) $e^2-e+1=0$ (c) $e^2+e+1=0$ (d) $e^4+e^2-1=0$

142. The line $2x+y=3$ cuts the ellipse $4x^2+y^2=5$ at P and Q. If θ be the angle between the normals at these points, then $\tan\theta=$ **[DCE 1995]**

(a) 1/2 (b) 3/4 (c) 3/5 (d) 5

143. The eccentric angles of extremities of a chord of an ellipse $\frac{x^2}{a^2}+\frac{y^2}{b^2}=1$ are θ_1 and θ_2. If this chord passes through the focus, then

(a) $\tan\frac{\theta_1}{2}\tan\frac{\theta_2}{2}+\frac{1-e}{1+e}=0$ (b) $\cos\frac{\theta_1-\theta_2}{2}=e.\cos\frac{\theta_1+\theta_2}{2}$

(c) $e=\frac{\sin\theta_1+\sin\theta_2}{\sin(\theta_1+\theta_2)}$ (d) $\cot\frac{\theta_1}{2}.\cot\frac{\theta_2}{2}=\frac{e+1}{e-1}$

144. Let F_1, F_2 be two foci of the ellipse and PT and PN be the tangent and the normal respectively to the ellipse at point P then

(a) PN bisects $\angle F_1PF_2$ (b) PT bisects $\angle F_1PF_2$

(c) PT bisects angle $(180^o-\angle F_1PF_2)$ (d) None of these

145. If CF is the perpendicular from the centre C of the ellipse $\frac{x^2}{a^2}+\frac{y^2}{b^2}=1$ on the tangent at any point P and G is the point when the normal at P meets the major axis, then $CF.\,PG=$

(a) a^2 (b) ab (c) b^2 (d) b^3

Chord of contact, Equation of the chord joining two points of an Ellipse

Basic Level

146. The equation of the chord of the ellipse $2x^2 + 5y^2 = 20$ which is bisected at the point (2, 1)is

(a) $4x + 5y + 13 = 0$ (b) $4x + 5y = 13$ (c) $5x + 4y + 13 = 0$ (d) None of these

147. If the chords of contact of tangents from two points (x_1, y_1) and (x_2, y_2) to the ellipse $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$ are at right angles, then $\frac{x_1x_2}{y_1y_2}$ is equal to

(a) $\frac{a^2}{b^2}$ (b) $-\frac{b^2}{a^2}$ (c) $-\frac{a^4}{b^4}$ (d) $-\frac{b^4}{a^4}$

148. Chords of an ellipse are drawn through the positive end of the minor axis. Then their mid-point lies on

(a) A circle (b) A parabola (c) An ellipse (d) A hyperbola

149. The length of the common chord of the ellipse $\frac{(x-1)^2}{9} + \frac{(y-2)^2}{4} = 1$ and the circle $(x-1)^2 + (y-2)^2 = 1$ is

(a) Zero (b) One (c) Three (d) Eight

Advance Level

150. If $\tan\theta_1 \tan\theta_2 = -\frac{a^2}{b^2}$, then the chord joining two points θ_1 and θ_2 on the ellipse $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$ will subtend a right angle at

(a) Focus (b) Centre (c) End of the major axis (d) End of the minor axis

151. If θ and ϕ are the eccentric angles of the ends of a focal chord of the ellipse $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$, then

(a) $\cos\frac{\theta-\phi}{2} = e\cos\frac{\theta+\phi}{2}$ (b) $\cos\frac{\theta-\phi}{2} + e\cos\frac{\theta+\phi}{2} = 0$ (c) $\cos\frac{\theta+\phi}{2} = e\cos\frac{\theta-\phi}{2}$ (d) None of these

Diameter of an ellipse, Pole and Polar and Conjugate diameters

Basic Level

152. With respect to the ellipse $3x^2 + 2y^2 = 1$, the pole of the line $9x + 2y = 1$ is

(a) $(-1, -3)$ (b) $(-1, 3)$ (c) $(3, -1)$ (d) $(3, 1)$

153. In the ellipse $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$, the equation of diameter conjugate to the diameter $y = \frac{b}{a}x$, is

(a) $y = -\frac{b}{a}x$ (b) $y = -\frac{a}{b}x$ (c) $x = -\frac{b}{a}y$ (d) None of these

154. If CP and CD are semi conjugate diameters of the ellipse $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$, then $CP^2 + CD^2 =$

(a) $a + b$ (b) $a^2 + b^2$ (c) $a^2 - b^2$ (d) $\sqrt{a^2 + b^2}$

155. The eccentricity of an ellipse whose pair of a conjugate diameter are $y = x$ and $3y = -2x$ is

(a) 2/3 (b) 1/3 (c) $1/\sqrt{3}$ (d) None of these

156. If eccentric angle of one diameter is $\frac{5\pi}{6}$, then eccentric angle of conjugate diameter is

(a) $\frac{2\pi}{3}$ (b) $\frac{4\pi}{3}$ (c) $\frac{2\pi}{3}$ or $\frac{4\pi}{3}$ (d) None of these

157. For the ellipse $\frac{x^2}{a^2}+\frac{y^2}{b^2}=1$, the equation of the diameter conjugate to $ax-by=0$ is

(a) $bx+ay=0$ (b) $bx-ay=0$ (c) $a^3y+b^3x=0$ (d) $a^3y-b^3x=0$

158. Equation of equi-conjugate diameter for an ellipse $\frac{x^2}{25}+\frac{y^2}{16}$ is

(a) $x=\pm\frac{5}{4}y$ (b) $y=\pm\frac{5}{4}x$ (c) $x=\pm\frac{25}{16}y$ (d) None of these

Advance Level

159. The locus of the point of intersection of tangents at the ends of semi-conjugate diameter of ellipse is

(a) Parabola (b) Hyperbola (c) Circle (d) Ellipse

160. AB is a diameter of $x^2+9y^2=25$. The eccentric angle of A is $\pi/6$. Then the eccentric angle of B is

(a) $5\pi/6$ (b) $-5\pi/6$ (c) $-2\pi/3$ (d) None of these

161. If the points of intersection of the ellipse $\frac{x^2}{a^2}+\frac{y^2}{b^2}=1$ and $\frac{x^2}{p^2}+\frac{y^2}{q^2}=1$ be the extremities of the conjugate diameter of first ellipse, then

(a) $\frac{x^2}{p^2}+\frac{y^2}{q^2}=2$ (b) $\frac{a^2}{p^2}+\frac{b^2}{q^2}=1$ (c) $\frac{a}{p}+\frac{b}{q}=1$ (d) $\frac{a^2}{p^2}+\frac{b^2}{q^2}=2$

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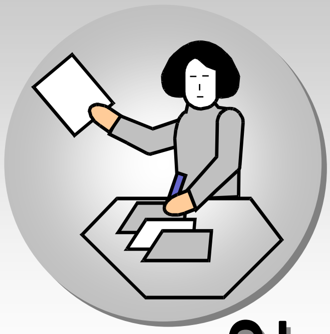

Answer Sheet

Conic Section : Ellipse *Assignment (Basic and Advance level)*

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
c	a	a	b	b	a	b	b	b	a	d	b	b	a	a	c	b	a	a	c
21	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**	**31**	**32**	**33**	**34**	**35**	**36**	**37**	**38**	**39**	**40**
c	b	a	a	b	d	b	b	b	b	b	c	b	d	d	d	a	b	a	d
41	**42**	**43**	**44**	**45**	**46**	**47**	**48**	**49**	**50**	**51**	**52**	**53**	**54**	**55**	**56**	**57**	**58**	**59**	**60**
c	c	b	c	b	b	c	a	a	d	b	d	c	a	b	a	a,c	d	a	d
61	**62**	**63**	**64**	**65**	**66**	**67**	**68**	**69**	**70**	**71**	**72**	**73**	**74**	**75**	**76**	**77**	**78**	**79**	**80**
c	a	b	b	b	a,b	b	a	a,c	b	b	a	d	b	a	b	d	c	b	b
81	**82**	**83**	**84**	**85**	**86**	**87**	**88**	**89**	**90**	**91**	**92**	**93**	**94**	**95**	**96**	**97**	**98**	**99**	**100**
a	c	c	a	a	c	b	b	b	a	a	a	c	a	c	c	c	a	b	c
101	**102**	**103**	**104**	**105**	**106**	**107**	**108**	**109**	**110**	**111**	**112**	**113**	**114**	**115**	**116**	**117**	**118**	**119**	**120**
a	c	b	c	c	b	b	a	d	b	c	c	d	b	a,b,c,d	b	d	d	d	d
121	**122**	**123**	**124**	**125**	**126**	**127**	**128**	**129**	**130**	**131**	**132**	**133**	**134**	**135**	**136**	**137**	**138**	**139**	**140**
b	c	b,c	c	b	d	a	d	b	a,b,c,d	c	b	d	b	c	c	a	b	c	b
141	**142**	**143**	**144**	**145**	**146**	**147**	**148**	**149**	**150**	**151**	**152**	**153**	**154**	**155**	**156**	**157**	**158**	**159**	**160**
d	c	a,b,c,d	a,c	c	b	c	c	a	b	a	d	a	b	c	c	c	a	d	b
161																			
d																			