CIRCLES

Vikasana - CET 2012

QUESTIONS

1. The radius of the circle $9x^2+y^2=4(x^2-y^2)-8x$

1. $3/5$
2. $8/5$
3. $5/3$
4. $4/5$

2. The radius of the circle $(x-y+a)^2+(y+x-a)^2=2a^2$ is

1. a
2. $\frac{a}{2}$
3. $2a^2$
4. $2a$

3. The radius of the circle $(x-a)(x-b)+(y-c)(y-d)=0$ is

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

4. The radius of the circle concentric with the circle $x^2 + y^2 - 6x + 12y + 15 = 0$ having 4 times its area is

1. $\sqrt{30}$
2. $3\sqrt{30}$
3. $2\sqrt{30}$
4. $4\sqrt{30}$

5. The centre of the circle $x(y+x-6)=y(x-y+8)$ is

1. (4, 3)
2. (3, 4)
3. (–4, –3)
4. (–3, 4)

6. The center of the circle $ax^2+(2a-3)y^2-4x-1=0$ is

1. (2,0)
2. (-2/3,0)
3. (2/3,0)
4. (1/3,0)

7. The centre and radius of the circle $x = 4 + 5\cos\theta$ and $y = 3 + 5\sin\theta$ is

1. (3, 5), 5
2. (4, 3), 5
3. (–3, 4), 5
4. None

8.If one end of the diameter of the circle $2x^2+2y^2-4x-8y+2=0$ is (3,2) then the other end is

1. (2,3)
2. (4,-2)
3.(2,-1)
4.(-1,2)

9. The equation of the circle with centre (3, 1) and touching the line $8x-15y+25=0$ is

1. $x^2+y^2-6x-2y+1=0$
2. $x^2+y^2-6x-2y+3=0$
3. $x^2+y^2-6x-2y+6=0$
4. None of these

10. The equation of a circle with centre at (1, 0) and circumference 10π units is

1. $x^2 + y^2 - 2x + 24 = 0$

2. $x^2 + y^2 - x - 25 = 0$

3. $x^2 + y^2 - 2x - 24 = 0$

4. $x^2 + y^2 + 2x + 24 = 0$

11. The equation of the circle passing through (2, 1) and touching co-ordinate axes is

1. $x^2 + y^2 - 2x + 2y + 1 = 0$

2. $x^2 + y^2 + 2x - 2y + 1 = 0$

3. $x^2 + y^2 - 2x - 2y + 1 = 0$

4. $x^2 + y^2 + 2x + 2y - 1 = 0$

12. The circles $x^2 + y^2 + 4x - 12y + 4 = 0$ and $x^2 + y^2 - 2x - 4y + 4 = 0$

1. Touch each other externally
2. Touch each other internally
3. Cut each other
4. Cut each other orthogonally

13. If the circle $x^2+y^2-4x+2y-4=0$ and $x^2+y^2+2x-6y+6=0$ touch each other, then the point of contact is

1.(1,7)
2.(-1,-7)
3. (1/5,7/5)
4. (7/5,1/5)

14. If $2x^2+axy + 2y^2 + (a–4)\,x + 6y – 5 = 0$ represents a circle then its area is

1. $23\pi/4$

2. $23\pi/2$

3. 23π

4. 46π

15. The equations of the tangents to the circle $x^2 + y^2 = 12$ which makes an angle 60° with the X-axis is

1. $\sqrt{3}x \pm 2\sqrt{3} = y$
2. $\sqrt{2}x \pm 4\sqrt{3} = y$
3. $\sqrt{3}x \pm 4\sqrt{3} = y$
4. None

16. if $2y+x+3=0$ touches the circle $5x^2+5y^2=k$ then k=

1. 4
2. 9
3. 16
4. 25

17. The length of the tangent drawn from (–2, 3) to the circle $2x^2 + 2y^2 = 3$ is

1. 5
2. 4
3. $\sqrt{\frac{23}{2}}$
4. $\frac{5}{\sqrt{2}}$

18. The point (1, 2) lies inside the circle

1. $x^2 + y^2 + 2x - 4y + 4 = 0$

2. $x^2 + y^2 - 2x - 4y + 4 = 0$

3. $x^2 + y^2 + 2x + 4y - 4 = 0$

4. None

19. The number of tangents drawn to the circle $x^2 + y^2 - 8x - 6y + 9 = 0$ from the point (3, –2) is

1. 1
2. 2
3. 0
4. none

20. The radicals axis of the circles $3x^2+3y^2=4x-5y+1=0$ & $2x^2+2y^2=3x+2y-7$ is

1.x-16y-23=0
2.2. X+23y-16=0
3.x+16y-23=0
4.4. None

21. Which of the following is a point on common chord of circles $x^2+y^2+2x-3y+6=0$ and $x^2+y^2+x-8y-13=0$

1.(1,2)
2.(1,-4)
3.(1,-2)
4.(1,4)

22. If the circles $x^2+y^2+2x+2ky+6=0$ and $x^2+y^2+2ky+k=0$ intersect orthogonally then k is

1. 2 or $-3/2$
2. -2 or $-3/2$
3. 2 or $3/2$
4. -2 or $3/2$

23. The circle $x^2 + y^2 - 6x - 8y + 9 = 0$ touches externally with a circle whose centre is origin. Then radius is equal to

1. 1
2. 16
3. 21
4. none

24. The tangents to $x^2+y^2-2x-3=0$ is parallel to x-axis at points

1. $(2, \pm\sqrt{3})$
2. $(1, \pm 2)$
3. $(\pm 1, 2)$
4. $(\pm 3, 0)$

25. The lines $2x - 3y = 5$ and $3x - 4y = 7$ are the diameters of a circle of area 154 sq.units. Then its equation is

1. $x^2 + y^2 + 2x - 2y - 62 = 0$
2. $x^2 + y^2 - 2x + 2y - 47 = 0$
3. $x^2 + y^2 - 12x - 2y - 47 = 0$
4. $x^2 + y^2 - 2x + 2y - 62 = 0$

26 Equation of a circle passing through the points (1,1), (5,-5) and (6,-4) is

1. $x^2+y^2+6x-4y=0$
2. $x^2+y^2-6x+4y=0$
3. $x^2+y^2-6x+4y-10=0$
4. $x^2+y^2+4x-6y=9$

27. If the points (0,0), (1,0), (0,1) and (t,t) are concyclic then t is equal to

1.-1
2.1
3.2
4.-2

28. Equation of the circle through origin. has center on $x+y-4=0$ and cuts $x^2+y^2-4x+2y+4=0$ orthogonally is

1. $x^2+y^2-2x-6y=0$
2. $x^2+y^2-4x-4y=0$
3. $x^2+y^2-6x-3y=0$
4. $x^2+y^2+4x-2y=0$

29. A circle touches the Y-axis at (0,2) and its X-intercept is 3
then equation of the circle is

1. $x^2+y^2\pm5y+4=0$
2. $x^2+y^2\pm5x-4y+4=0$
3. $x^2+y^2+5x\pm4y+4=0$
4. $-x^2+y^2\pm5x+4y-4=0$

30. If a circle $x^2 + y^2 - 17x + 2fy + c = 0$ passes through (3, 1) (14, –1) and (11, 5) then c =

1. 0
2. –41
3. –17/2
4. 41

31. Two circles of equal radius r cut orthogonally if their centres are (2, 3) and (5, 6) then r =

1. 1
2. 2
3. 3
4. 4

32. The line $y = x$ is tangent at (0, 0) to a circle of radius unity. The centre of the circle is

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

33. The gradient of tangent at (6, 8) to $x^2 + y^2 = 100$ is

1. $3/4$
2. $4/3$
3. $-3/4$
4. $-4/3$

34. Any point on circle $x^2+y^2+4x-2y=0$ is given by

1. $\left(\sqrt{5}\cos\theta, \sqrt{5}\sin\theta\right)$
2. $\left(\sqrt{5}\sin\theta, \sqrt{5}\cos\theta\right)$
3. $\left(-2+\sqrt{5}\cos\theta, 1+\sqrt{5}\sin\theta\right)$
4. $(\cos\theta, \sin\theta)$

35. The shortest distance between (0, 5) to circumference of circle $x^2+y^2-10x+14y-151=0$ is

1. 13
2. 9
3. 3
4. 5

36. Length of the chord and circle $x^2 + y^2 + 3x + 2y - 8 = 0$ intercepted by y-axis is

1. 3
2. 8
3. 9
4. 6

37. Two lines $3x-2y-8=0$ and $2x-y-5=0$ are two diameters and circle touches X-axis then equation of circle

1. $(x-2)^2+(y-1)^2=1$
2. $(x+2)^2+(y-1)^2=1$
3. $(x-2)^2+(y+1)^2=1$
4. $(x+2)^2+(y+1)^2=1$

38. The equation of tangent to $x^2 + y^2 = 25$, which makes 45^0 angle with X-axis

1. $x = y$
2. $y = x \pm 5\sqrt{2}$
3. $x = y \pm 5\sqrt{2}$
4. $x + y = 5\sqrt{2}$

39. Length of the chord of circle $x^2+y^2=9$ intercepted by the line $x+2y-3=0$ is

1. 8
2. $12\sqrt{5}$
3. $12/\sqrt{5}$
4. $5\sqrt{12}$

40. The length of the tangent from (–1, 2) to the circle $4x^2 + 4y^2 - 8x + y - 6 = 0$ is

1) 24

2) $\sqrt{24}$

3) 76

4) $\sqrt{6}$

41. The angle between a pair of tangents from a point P to circle $x^2+y^2+4x-6y+9\sin^2\alpha+13\cos^2\alpha=0$ is 2α. The equation of the locus of P is

1. $x^2+y^2+4x-5y+4=0$
2. $x^2+y^2+4x-6y-9=0$
3. $x^2+y^2+4x-6y-4=0$
4. $x^2+y^2+4x-6y+9=0$

42. Circumcentre of the triangle whose vertices are (0, 0), (6, 0) and (0, 4) is

1. (2, 0)
2. (3, 0)
3. (0, 3)
4. (3, 2)

43. The value of k such that the equation $2x^2 + 2y^2 - 6x + 8y + k = 0$, represents a point circle is

1. 0
2. 25
3. $\frac{25}{2}$
4. $\frac{-25}{2}$

44. If (x, y) and (3, 5) are the extremities of a diameter of a circle with centre at (2, 3) then the values of x and y are

1. $x = 1,\ y = 4$
2. $x = 4,\ y = 1$
3. $x = 8,\ y = 2$
4. none

45. If two circles $a(x^2+y^2)+bx+cy=0$ and $A(x^2+y^2)+Bx+Cy=0$ touch each other then

1. $aC=cA$
2. $bC=cB$
3. $aB=bA$
4. $aA=bB=cC$

46. Y-axis is a tangent to the circle $x^2 + y^2 + 2gx + 2fy + c = 0$ if

1. $g^2 < c$
2. $f^2 < c$
3. $g^2 = c$
4. $f^2 = c$

47. The value of k for which the circles $x^2+y^2-3x+ky-5=0$ and $4x^2+4y^2-12x-y-9=0$ becomes concentric is

1. $1/8$
2. $-1/8$
3. $1/4$
4. $-1/4$

48. The equation of the chord of the circle $x^2 + y^2 - 4x = 0$, whose mid – point is (1, 0) is

1. $y = 2$
2. $y = 1$
3. $x = 2$
4. $x = 1$

49. Which of the following lines is a normal to the circle $(x-1)^2+(y-2)^2=10$

1. $x+y=3$

2. $(x-1)+(y-2)=10$

3. $x+2y=10$

4. $2x+y=3$

50. The number of common tangents to the circles $x^2+y^2-x=0$ and $x^2+y^2-2x+24=0$ is

1.2
2.1
3.4
4.3

51. The equation of the circle with (3, 4) and (4, 3) as ends of a diameter is

1. $x^2 + y^2 + 7x + 7y + 24 = 0$
2. $x^2 + y^2 - 6x - 8y + 25 = 0$
3. $x^2 + y^2 - 7x - 7y + 24 = 0$
4. None

52. The equation of the circle passing through the point (–7, 1) having centre (–4, –3) is

1. $x^2 + y^2 + 8x + 6y = 0$
2. $x^2 + y^2 + 4x + 3y = 0$
3. $x^2 + y^2 - 8x - 6y = 0$
4. None

53.Equation of the circle through (2,0),
having center on 3x-y-5=0
and length of tangent from (3,1) is 8 is

1.$x^2+y^2-2x+4y=0$
2.$x^2+y^2-2x-8y=0$
3.$x^2+y^2+4y-3x+1=0$
4.$x^2+y^2+2x-8y-6=0$ or none

54. If the square of the lengths of the tangents from P to $x^2 + y^2 = b^2$ and $x^2 + y^2 = c$ are in A.P. Then $a^2,\ b^2,\ c^2$ are in

1. AP
2. GP
3. HP
4. AGP

55. Area of triangle formed by +ve X-axis, tangent and normal to $x^2 + y^2 = 4$ at $\left(1, \sqrt{3}\right)$ is

1. $2\sqrt{3}$
2. $4\sqrt{3}$
3. $3\sqrt{3}$
4. $\sqrt{3}$

56. The lines $3x-4y+4=0$ and $6x-8y-7=0$ are tangent to the same circle. The radius of the circle is

1. $4/5$
2. $7/10$
3. $3/4$
4. $3/2$

57. The slope of the normal to the circle $x^2 + y^2 - 16x + 12y + 75 = 0$ at the point (5, –2) is

1. $4/5$
2. $3/4$
3. $-4/3$
4. $-3/4$

58. If $3x - 4y + k = 0$, is a tangent to the circle $(x-1)^2 + (y-1)^2 = 2^2$ then k =

1. ± 10

2. 9, –11

3. 11

4. None

59. The equation $x^2+y^2+4x+6y+13=0$ represents

1. Circle

2. A pair of two distinct lines

3. A pair of coincidental lines

4. A point circle

60. If $y = x + a\sqrt{2}$ touches the circle $x^2 + y^2 = a^2$ at the point

1) $\left(\frac{a}{\sqrt{2}}, \frac{a}{\sqrt{2}}\right)$

2) $\left(\frac{-a}{\sqrt{2}}, \frac{-a}{\sqrt{2}}\right)$

3) $\left(\frac{a}{\sqrt{2}}, \frac{-a}{\sqrt{2}}\right)$

4) $\left(\frac{-a}{\sqrt{2}}, \frac{a}{\sqrt{2}}\right)$

61. The radius of the circle with centre at (0, 2) and cutting orthogonally to the circle $x^2 + y^2 - 2x + y = 0$ is

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

62. If $2x - 3y = 0$ is the equation of the common chord of the circles $x^2 + y^2 + 4x = 0$ and $x^2 + y^2 + 2\lambda y = 0$, then λ=

1. 3
2. 2
3. 1
4. 0

63. The abscissa of two points A and B are the roots of $x^2 - 4x + 2 = 0$ and their ordinates are the roots of $x^2 + 6x - 3 = 0$. The equation of the circle with AB as diameter is

1. $x^2 + y^2 + 4x - 6y + 1 = 0$
2. $x^2 + y^2 - 4x - 6y + 1 = 0$
3. $x^2 + y^2 - 4x + 6y - 1 = 0$
4. $x^2 + y^2 + 4x + 6y + 1 = 0$

64. If a circle passes through the point (a,b) and cuts the circle $x^2 + y^2 = 4$, orthogonally, then the locus of its centre is

1. $2ax - 2by + \left(a^2 + b^2 + 4\right) = 0$
2. $2ax + 2by - \left(a^2 + b^2 + 4\right) = 0$
3. $2ax + 2by + \left(a^2 + b^2 + 4\right) = 0$
4. $2ax - 2by - \left(a^2 + b^2 + 4\right) = 0$

65. The radius of the circle
$x^2 + y^2 - 2x\cos t + 2y\sin t - 15 = 0$ is

1. 3
2. 4
3. 5
4. $\sin t \cos t$

66. The area of a circle with centre at (1,2) and passing through (4, 6) is

1. 30π
2. 5π
3. 15π
4. 25π

67. The equations $x = a\cos\theta + b\sin\theta$ and $y = a\sin\theta - b\cos\theta, 0 \le \theta \le 2\pi$ represents a

1. a circle
2. degenerate circle
3. an empty set
4. a pair of st. lines

68. $x^2 + y^2 - 7x + 8y - 11 = 0$ is a circle.
The points (0, 0) and (1, 8) lie

1. both inside the circle
2. both outside the circle
3. one outside the circle & one inside
4. one on the circle and the other outside

69. The centres of the circles $x^2 + y^2 = 1$, $x^2 + y^2 + 6x - 2y - 1 = 0$ and $x^2 + y^2 - 12x + 4y - 1 = 0$ lie on

1. a circle
2. a st. line
3. $x^2 = 9y$
4. None

70. The square of the length of the tangent from (3, –4) to the circle $x^2 - y^2 - 4x - 8y + 3 = 0$ is

1. 20
2. 30
3. 48
4. 50

71. The equation of the diameter of the circle $x^2 + y^2 + 6x - 4y - 2 = 0$, passing through the point (2, –3) is

1. $x + 3y + 7 = 0$
2. $2x + y - 1 = 0$
3. $6x + 3y - 3 = 0$
4. $x + y + 1 = 0$

72. If one common tangent can be drawn to the circles $x^2 + y^2 - 2x - 4y - 20 = 0$ and $(x+3)^2 + (y+1)^2 = p^2$, then p =

1. 20
2. 16
3. 49
4. 10

73. If $x=7$ touches the circle $x^2+y^2-4x-67-12=0$, then the co-ordinates of the point of contact is

1. (7, 3)
2. (7, 4)
3. (7, 8)
4. (7, 2)

74. The triangle PQR is inscribed in the circle $x^2 + y^2 = 25$. If Q and R have co-ordinates (3, 4) and (–4, 3) respectively then $Q\hat{P}R$ is

1. $\pi/2$
2. $\pi/3$
3. $\pi/4$
4. $\pi/6$

75. If two lines $3x-2y-8=0$ and $2x-y-5=0$ lie along two diameters of a circle which touches the x – axis then the equation of the circle is

1. $(x-2)^2+(y-1)^2=1$
2. $(x+2)^2+(y-1)^2=1$
3. $(x-2)^2+(y+1)^2=1$