1. The equation of a circle with origin as centre passing through the vertices of an equilateral triangle whose median is of length $3a$ is

(a) $x^2+y^2=9a^2$ (b) $x^2+y^2=16a^2$

(c) $x^2+y^2=a^2$ (d) None of these

2. If the line $x+2by+7=0$ is a diameter of the circle $x^2+y^2-6x+2y=0$, then $b=$

(a) 3 (b) - 5 (c) - 1 (d) 5

3. If the lines $3x-4y+4=0$ and $6x-8y-7=0$ are tangents to a circle, then the radius of the circle is

(a) 3/2 (b) ¾ (c) 1/10 (d) 1/20

4. The number of points with integral coordinates that are interior to the circle $x^2+y^2=16$ is

(a) 43 (b) 49 (c) 45 (d) 51

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

(a) $x^2+y^2+4x-6y+4=0$ (b) $x^2+y^2+4x-6y-9=0$

(c) $x^2+y^2+4x-6y-4=0$ (d) $x^2+y^2+4x-6y+9=0$

6. Tangents are drawn from any point on the circle $x^2+y^2=a^2$ to the circle $x^2+y^2=b^2$. If the chord of contact touches the circle $x^2+y^2=c^2$, $a>b$, then

(a) a, b, c are in *A.P* (b) a, b, c are in *G.P.*

(c) a, b, c are in *H.P* (d) a, c, b are in *G.P.*

7. The pole of the straight line $9x+y-28=0$ with respect to circle $2x^2+2y^2-3x+5y-7=0$ is

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

8. If circles $x^2+y^2+2ax+c=0$ and $x^2+y^2+2by+c=0$ touch each other, then

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

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

9. If the common chord of the circles $x^2+(y-\lambda)^2=16$ and $x^2+y^2=16$ subtend a right angle at the origin, then λ is equal to

(a) 4 (b) $4\sqrt{2}$

(c) $\pm 4\sqrt{2}$ (d) 8

10. The centre of the circle, which cuts orthogonally each of the three circles $x^2+y^2+2x+17y+4=0$, $x^2+y^2+7x+6y+11=0$ and $x^2+y^2-x+22y+3=0$ is

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

(c) (2, 3) (d) (0, 2)

11. The equation of the circle, which passes through the point $(2a, 0)$ and whose radical axis is $x=\frac{a}{2}$ with respect to the circle $x^2+y^2=a^2$, will be

(a) $x^2+y^2-2ax=0$ (b) $x^2+y^2+2ax=0$

(c) $x^2+y^2+2ay=0$ d) $x^2+y^2-2ay=0$

12. The equation of the image of the circle $x^2+y^2+16x-24y+183=0$ by the line mirror $4x+7y+13=0$ is

(a) $x^2+y^2+32x-4y+235=0$

(b) $x^2+y^2+32x+4y-235=0$

(c) $x^2+y^2+32x-4y-235=0$

(d) $x^2+y^2+32x+4y+235=0$

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

(a) $2ax+2by-(a^2+b^2+K^2)=0$

(b) $2ax+2by-(a^2-b^2+K^2)=0$

(c) $x^2+y^2-3ax-4by+(a^2+b^2-K^2)=0$

(d) $x^2+y^2-2ax-3by+(a^2-b^2-K^2)=0$

14. If $(2,6)$ is an interior point of the circle $x^2+y^2-8x-12y+p=0$ and the circle neither cuts nor touches any one of the axes of co-ordinates then

(a) $p\in(36,47)$ (b) $p\in(16, 47)$

(c) $p\in(16, 36)$ (d) none of these

15. Equation of circle through intersection of $x^2+y^2+2x=0$ and $x-y=0$, having minimum radius is-

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

(c) $x^2+y^2-2x-2y=0$ (d) None of these

16. A circle passes through the points of intersection of lines $x+y=1$ and $x+\lambda y-3=0$ with co-ordinate axis. Then

(a) $\lambda=-1$ (b) $\lambda=1$

(c) $\lambda=2$ (d) $\lambda=-2$

17. C, C_1, C_2 are circles of radii 5, 3, 2 respectively. C_1 and C_2 touch each other externally and C internally. The radius of circle C_3 which touches C internally and C_1 and C_2 externally is-

(a) 3/2 (b) 20/9 (c) 35/19 (d) 30/19

18. The values of α for which the point $(\alpha-1, \alpha+1)$ lies in the larger segment of the circle $x^2+y^2-x-y-6=0$ made by the chord whose equation is $x+y-2=0$ is -

(a) $-1 < \alpha < 1$ (b) $1 < \alpha < \infty$

(c) $-\infty < \alpha < -1$ (d) $\alpha \le 0$

19. The point ([P + 1], [P]) (where [x] is the greatest integer less than or equal to x), lying inside the region bounded by the circle

$x^2 + y^2 - 2x - 15 = 0$ and $x^2 + y^2 - 2x - 7 = 0$. Then

(a) $P \in [1, 0) \cup (0, 1) \cup (1, 2)$

(b) $P \in (0, 1)$

(c) $P \in (1, 2)$

(d) None of these

20. The minimum distance between the circle $x^2 + y^2 = 9$ and the curve $2x^2 + 10y^2 + 6xy = 1$ is

(a) $2\sqrt{2}$ (b) 2 (c) $3 - \sqrt{2}$ (d) $3 - \frac{1}{\sqrt{11}}$

21. If PQR is the triangle formed by the common tangent to the circle $x^2 + y^2 + 6x = 0$ and

$x^2 + y^2 - 2x = 0$ then -

(a) Centroid of ΔPQR is (1, 0)

(b) Incentre of the ΔPQR is (1, 1)

(c) Circum centre of the ΔPQR is (1, 2)

(d) Orthocentre of the ΔPQR is (2, 0)

22. The number of points inside or on the circle $x^2 + y^2 = 4$ satisfying $\tan^4 x + \cot^4 x + 1 = 3 \sin^2 y$, is

(a) One (b) Two (c) Four (d) Infinite

23. The locus of centre of circle of radius 2 units, if intercept cut on x-axis by circle is twice of intercept on y-axis is

(a) $4x^2 - 3y^2 = 4$ (b) $4x^2 - y^2 = 12$

(c) $4y^2 - x^2 = 12$ (d) $4y^2 - 3x^2 = 4$

24. The centre of a set of circles, each of radius 3, lie on $x^2 + y^2 = 25$. The locus of any point in the set is

(a) $4 \le x^2 + y^2 \le 64$ (b) $3 \le x^2 + y^2 \le 9$

(c) $x^2 + y^2 \ge 25$ (d) None of these

25. Two parallel tangents to a given circle are cut by a third tangent at the points A and B. If C be the centre of the given circle then $\angle ACB$

(a) Depends on the radius of circle

(b) Depends on the centre of circle

(c) Depends on the slopes of three tangents

(d) Is always constant

26. If $3x^2 + 2\lambda xy + 3y^2 + (6 - \lambda)x + (2\lambda - 6)y - 21 = 0$ is the equation of a circle, then its radius is-

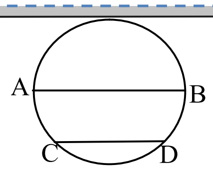
(a) 1 (b) 3 (c) $2\sqrt{2}$ (d) None

27. A variable chord is drawn through the origin to the circle $x^2 + y^2 - 2ax = 0$. The locus of the centre of the circle drawn on this chord as diameter is

(a) $x^2 + y^2 + ax = 0$ (b) $x^2 + y^2 + ay = 0$

(c) $x^2 + y^2 - ax = 0$ (d) $x^2 + y^2 - ay = 0$

28. AB is a diameter of a circle. CD is a chord parallel to AB(as shown in the diagram) and 2CD = AB. The tangent at B meets the line AD produced at E, then -



(a) AE = 2AB (b) $\sqrt{3}$ AB = AE

(c) $\sqrt{2}$ AB = AE (d) 2AB = $\sqrt{3}$ AE

29. A circle C_1 of radius b touches the circle $x^2 + y^2 = a^2$ externally and has its centre on the positive x-axis; another circle C_2 of radius c touches the circle C_1 externally and has its centre on the positive x-axis. Given a < b < c, then the three circles have a common tangent if a, b, c are in -

(a) A.P. (b) G.P. (c) H.P. (d) None of these

30. The line $lx + my = 1$ intersects the circle $x^2 + y^2 = a^2$ at points A, B, if AB subtends 45° at the origin, then $a^2 (l^2 + m^2)$ -

(a) $4 \pm 2\sqrt{2}$ (b) $4 \pm 2\sqrt{6}$

(c) $2\sqrt{6}$ (d) $4 - \sqrt{6}$

31. The centre of the circle passing through the point (0, 1) and touching the curve $y = x^2$ at (2, 4) is -

(a) $\left(\frac{-16}{5}, \frac{27}{10}\right)$ (b) $\left(\frac{-16}{7}, \frac{53}{10}\right)$

(c) $\left(\frac{-16}{5}, \frac{53}{10}\right)$ (d) None

32. Two circles, each of radius 5 units, touch each other at (1, 2). If the equation of their common tangent is 4x + 3y - 10 = 0, then equation of one such circle is-

(a) $x^2 + y^2 - 6x + 2y + 15 = 0$

(b) $x^2 + y^2 - 10x - 10y + 25 = 0$

(c) $x^2 + y^2 + 6x - 2y - 15 = 0$

(d) $x^2 + y^2 - 10x - 10y - 25 = 0$

33. The equation of the radical of a coaxial system of circle whose limiting points are (2, - 1) and (-3, 2), is -

(a) 5x + 3y - 4 = 0 (b) 5x + 3y + 4 = 0

(c) 5x - 3y + 4 = 0 (d) 3x - 5y + 4 = 0

34. The equation of a circle passing through the point (4, 5) having the centre at (2, 2) is -

(a) $x^2 + y^2 + 4x + 4y - 5 = 0$ (b) $x^2 + y^2 - 4x - 4y - 5 = 0$

(c) $x^2 + y^2 - 4x = 13$ (d) $x^2 + y^2 - 4x - 4y + 5 = 0$

35. The area of portion of the circle $x^2 + y^2 - 4y = 0$ lying below x-axis is -

(a) 0 (b) 48 π

(c) 82π (d) None of these

36. If the coordinate at one end of diameter of the circle $x^2 + y^2 - 8x - 4y + c = 0$ are (-3,2), the coordinate at the other end are -

(a) (5, 3) (b) (6, 2)

(c) (1, -8) (d) (11, 2)

37. What will be the equation of circle whose centre is (3, -1) and which intercept chord of 6 unit length on straight line 2x - 5y + 18 = 0

(a) $x^2 + y^2 - 6x + 2y - 28 = 0$

(b) $x^2 + y^2 + 6x - 2y + 28 = 0$

(c) $x^2 + y^2 + 4x - 2y + 24 = 0$
(d) $x^2 + y^2 + 2x - 2y - 12 = 0$

38. Equation of circle passing through the point of intersection of circles $x^2 + y^2 = 6$ and $x^2 + y^2 - 6x + 8 = 0$ and point (1, 1) is-
(a) $x^2 + y^2 - 6x + 4 = 0$ (b) $x^2 + y^2 - 3x + 1 = 0$
(c) $x^2 + y^2 - 4y + 2 = 0$ (d) $x^2 + y^2 - 6x - 6y + 10 = 0$

39. The abscissa of A and B are the roots of the equation $x^2 + 2ax - b^2 = 0$ and their ordinates are the roots of the equation $y^2 + 2py - q^2 = 0$. The equation of the circle with AB as diameter:
(a) $x^2 + y^2 + 2ax + 2py - b^2 - q^2 = 0$
(b) $x^2 + y^2 + 2ax + py - b^2 - q^2 = 0$
(c) $x^2 + y^2 + 2ax + 2py + b^2 + q^2 = 0$
(d) None of these

40. The locus of the mid points of the chord of the circle $x^2 + y^2 = 4$ which subtends a right angle at the origin is -
(a) $x + y = 2$ (b) $x^2 + y^2 = 1$
(c) $x^2 + y^2 = 2$ (d) $x + y = 1$

41. If the circle $x^2 + y^2 + 4x + 22y + c = 0$ bisects the circumference of the circle $x^2 + y^2 - 2x + 8y - d = 0$ then c + d =
(a) 40 (b) 50 (c) 60 (d) 70

42. The circle with equation $x^2 + y^2 - 6x - 8y + 8 = 0$ doesn't lie in -
(a) 3rd and 4th quadrant
(b) 2nd and 3rd quadrant
(c) 3rd quadrant only
(d) 4th quadrant only

43. The area of the circle whose centre is at (1, 2) and which passes through the point (4, 6) is -
(a) 5π (b) 10π (c) 25π (d) None of these

44. If the line $y = \sqrt{3}x + k$ touches the circle $x^2 + y^2 = 16$, then k =
(a) 0 (b) 2 (c) 4 (d) 8

45. The equation of the chord of contact, if the tangents are drawn from the point (5, -3) to the circle $x^2 + y^2 = 10$, is -
(a) $5x - 3y = 10$ (b) $5x + 3y = 10$
(c) $3x + 5y = 10$ (d) $3x - 5y = 10$

46. The square of the length of the tangent from (3, - 4) on the circle $x^2+y^2-4x - 6y + 3 = 0$ is -
(a) 20 (b) 30 (c) 40 (d) 50

47. The equation of the circle passing through the point (-2, 4) and through the points of intersection of the circle $x^2 + y^2 - 2x - 6y + 6=0$ and the line $3x + 2y - 5 = 0$, is -
(a) $x^2 + y^2 + 2x - 4y - 4 = 0$ (b) $x^2 + y^2 + 4x - 2y - 4 = 0$
(c) $x^2 + y^2 - 3x - 4y = 0$ (d) $x^2 + y^2 - 4x - 2y = 0$

48. The equation of circle passing through the points of intersection of circles $x^2+y^2-6x+8 = 0$ and $x^2 + y^2 = 6$ and point (1,1) is -
(a) $x^2 + y^2 - 6x + 4 = 0$ (b) $x^2 + y^2 - 3x + 1 = 0$
(c) $x^2 + y^2 - 4y + 2 = 0$ (d) None of these

49. If the equation $\frac{K(x+1)^2}{3} + \frac{(y+2)^2}{4} = 1$ represents a circle, then K =
(a) 3/4 (b) 1 (c) 4/3 (d) 12

50. The range of λ, if the line $3x - 4y = \lambda$ meets the circle $x^2 + y^2 -4x -8y - 5 = 0$ in real points-
(a) (0, 15) (b) (-35, 15)
(c) (-35, 0) (d) None of these

51. If circles $x^2 + y^2 - 3x + \lambda y - 5 = 0$ and $4x^2 + 4y^2 - 12x + y - 9 = 0$ are concentric then λ equals
(a) $\frac{1}{4}$ (b) $-\frac{1}{4}$ (c) $\frac{1}{8}$ (d) $-\frac{1}{8}$

52. If circles $x^2 + y^2 + kx + 4y + 2= 0$ and $2(x^2 + y^2) - 4x - 3y + k = 0$ intersect orthogonally, then k is equal to
(a) $\frac{10}{3}$ (b) $-\frac{10}{3}$ (c) $\frac{8}{3}$ (d) $-\frac{8}{3}$

53. Equation of the circle concentric with the circle $x^2 + y^2 - 4x - 6y - 91 = 0$ and passing through the point (-4, -5) is -
(a) $x^2 + y^2 - 4x - 8y - 97 = 0$
(b) $x^2 + y^2 - 2x - 8y - 95 = 0$
(c) $x^2 + y^2 - 4x - 6y - 87 = 0$
(d) None of these

54. The locus of the centre of a circle which touches externally the circle $x^2 + y^2 - 6x - 6y + 14 = 0$ and also touches the y-axis is given by the equation -
(a) $x^2 - 6x - 10y + 14 = 0$ (b) $x^2 - 10x - 6y + 14 = 0$
(c) $y^2 - 6x - 10y + 14 = 0$ (d) $y^2 - 10x - 6y + 14 = 0$

55. AB is a diameter of a circle and C is any point on the circumference of the circle, then
(a) The area of ΔABC is maximum when it is isosceles.
(b) The area of ΔABC is minimum when it is isosceles
(c) The perimeter of ΔABC is maximum when it is isosceles
(d) None

56. The radius of the circle passing through point (6, 2) and having $x + y = 6$ as its normal and $x + 2y = 4$ as its diameter is
(a) 10 (b) $2\sqrt{5}$ (c) $5\sqrt{2}$ (d) $4\sqrt{5}$

57. A triangle is formed by the lines whose combined equation given by $(x + y - 4)(xy - 2x - y + 2) = 0$. The equation of circumcircle is -
(a) $x^2 + y^2 - 5x - 3y + 8$
(b) $x^2 + y^2 - 3x - 5y + 8 = 0$
(c) $x^2 + y^2 - 3x - 5y - 8 = 0$
(d) None of these

58. If the circle $x^2 + y^2 + 6x - 2y + k = 0$ bisects the circumference of the circle $x^2 + y^2 + 2x - 6y -15 = 0$, then k is equal to
(a) 21 (b) -21 (c) 23 (d) -23

59. The locus of the centre of a circle which cuts orthogonally the circle $x^2 - 20x + y^2 + 4 = 0$ and which touches $x = 2$ is
(a) $y^2 = 16x + 4$ (b) $x^2 = 16y$

(c) $x^2 = 16y + 4$ (d) $y^2 = 16x$

60. In a triangle ABC, $\frac{r_1}{bc}+\frac{r_2}{ca}+\frac{r_3}{ab}$ is equal to

(a) $\frac{1}{2R}-\frac{1}{r}$ (b) 2R - r

(c) r - 2R (d) $\frac{1}{r}-\frac{1}{2R}$

61. The number of integral values of λ for which $x^2+y^2+\lambda x+(1-\lambda)y+5=0$ is the equation of a circle whose radius cannot exceed 5, is

(a) 14 (b) 18 (c) 16 (d) None of these

62. In the co-axial system of circle $x^2+y^2+2gx+c=0$ where g is a parameter, if $c > 0$. Then the circles are

(a) Orthogonal (b) Touching type

(c) Intersecting type (d) Non intersecting type

63. The circle $x^2 + y^2 + 2a_1x + b = 0$ lies completely inside the circle $x^2 + y^2 + 2a_2x + b = 0$, then

(a) $a_1a_2 > 0, b < 0$ (b) $a_1a_2 > 0, b > 0$

(c) $a_1a_2 < 0, b < 0$ (d) $a_1a_2 < 0, b > 0$

64. The locus of the point of intersection of the tangents to the circle $x = r\cos\theta$, $y = r\sin\theta$ at points whose parametric angles differ by $\pi/3$, is-

(a) $x^2 + y^2 = 4(2-\sqrt{3})r^2$ (b) $3(x^2 + y^2) = 1$

(c) $x^2 + y^2 = (2-\sqrt{3})r^2$ (d) $3(x^2 + y^2) = 4r^2$

65. If m_1 and m_2 be the slopes of two perpendicular chord of equal length passing through origin of circle $(x - 1)^2 + (y + 2)^2 = 5$, then the value of $m_1^2+m_2^2$ is equal to -

(a) $\frac{80}{9}$ (b) $\frac{82}{9}$ (d) $\frac{83}{9}$ (d) None of these

66. A line meets the coordinate axis in A and B. A circle is circumscribed about the triangle OAB. If the distances from A and B of the tangent to the circle at the origin be m and n then the diameter of the circle is -

(a) m (m + n) (b) m + n

(c) n (m + n) (d) $m^2 + n^2$

67. If the circles ax2 + ay2 + 2bx + 2cy = 0 and Ax2 + Ay2 + 2Bx + 2Cy = 0 touch each other, then-

(a) bC = Cb (b) aC = cA

(c) aB = bA (d) $\frac{a}{A}=\frac{b}{B}=\frac{c}{C}$

68. A circle C_1 is drawn having any point P on x- axis as its centre and passing through the centre of the circle (c) = $x^2 + y^2 = 1$. A common tangent to C_1 and C intersects the circles at Q and R respectively. Then Q(x,y) always satisfies

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

(c) $y^2 - 1 = 0$ (d) None

69. From a point P outside of a circle with centre at C tangents PX and PY are drawn such that $\frac{1}{(CX)^2}+\frac{1}{(PX)^2}=\frac{1}{16}$ then the length of chord XY is -

(a) 8 (b) 12 (c) 16 (d) None of these

70. A circle touches sides AB and AD of rectangle ABCD at P and Q respectively and passes through vertex C. If distance of C from chord PQ is 5 units, then area of rectangle is-

(a) 45 (b) 75 (c) 50 (d) 25

71. If the radius of the circumcircle of the triangle TPQ, where PQ is chord of contact corresponding to point T w.r.to circle $x^2 + y^2 - 2x + 4y - 11 = 0$, is 6 units, then minimum distance of T from the director circle of the given circle is

(a) 6 (b) 12 (c) $6\sqrt{2}$ (d) $12 - 4\sqrt{2}$

72. A, B are variable points lying on the lines y = 2x and y = x respectively such that AB = 4. The locus of the mid point of AB is -

(a) $x^2 + y^2 \pm 2x + 7 = 0$ (b) Circle

(c) $x^2 + 13y - 25 = 0$ (d) $25x^2 + 13y^2 - 36xy - 4 = 0$

73. If θ is the angle of intersection of two circle $x^2 + y^2 = a^2$ and $(x - c)^2 + y^2 = b^2$, then the length of common chord of two circle is -

(a) $\frac{ab}{\sqrt{a^2+b^2-2ab\cos\theta}}$ (b) $\frac{2ab}{\sqrt{a^2+b^2-2ab\cos\theta}}$

(c) $\frac{2ab\sin\theta}{\sqrt{a^2+b^2-2ab\cos\theta}}$ (d) None of these

74. Consider the two circles $C_1 : x^2 + y^2 = r_1^2$ and $C_2 : x^2 + y^2 = r_2^2$ ($r_2 < r_1$). Let A be a fixed point on the circle C_1, set A(r_1, 0) and 'B' be a variable point on the circle C_2. Then line BA meets the circles C_2 again at C. Then the set of values of $OB^2 + OA^2 + BC^2$ is -

(a) $[5r_2^2 - 3r_1^2, 5r_2^2 + r_1^2]$ (b) $[3r_2^2 - 5r_1^2, 5r_2^2 + r_1^2]$

(c) $[5r_2^2 - 3r_1^2, r_2^2 + 5r_1^2]$ (d) None of these

75. The range of values of r for which the point $\left(-5+\frac{r}{\sqrt{2}},-3+\frac{r}{\sqrt{2}}\right)$ is an interior point of the major segment of the circle $x^2 + y^2 = 16$, cut off by the line x + y = 2, is -

(a) $(-\infty, 5\sqrt{2})$ (b) $(4\sqrt{2} - \sqrt{14}, 5\sqrt{2})$

(c) $(4\sqrt{2} - \sqrt{14}, 4\sqrt{2} + \sqrt{14})$ (d) None of these

76. Let $A_0\ A_1\ A_2\ A_3\ A_4\ A_5$ be a regular hexagon inscribed in a unit circle with centre at the origin. Then the product of the lengths of the line segments A_0A_1, A_0A_2 and A_0A_4 is-

(a) ¾ (b) $3\sqrt{3}$ (c) 3 (d) $3\sqrt{3}/2$

77. A circle with centre at the origin and radius equal to a meets the axis of x at A and B. P(α) and Q(β) are two points on this

circle so that $\alpha \square \beta = 2\gamma$, where γ is a constant. The locus of the point of intersection of AP and BQ is -
(a) $x^2 - y^2 - 2ay \tan\gamma = a^2$ (b) $x^2 + y^2 - 2ay \tan\gamma = a^2$
(c) $x^2 + y^2 + 2ay \tan\gamma = a^2$ (d) $x^2 - y^2 + 2ay \tan\gamma = a^2$

78. Equation of largest chord of circle $x^2 + y^2 - 2x + 2y - 2 = 0$ which cuts equal intercepts on positive x and y axis is
(a) $x - y = 2$ (b) $y = -x$ (c) $y = 2x$ (d) None

79. If abscissae & ordinates of ends of diameter of circle are roots of quadratic equation $x^2 + 2x - 1 = 0$ & $x^2 - 2x - 7 = 0$ then sum of length of intercepts made by this circle on axes
(a) $6\sqrt{2}$ (b) $4\sqrt{2}$ (c) 6 (d) 12

80. If variable line $y = mx$ always intersect circle $x^2 + y^2 + 2gx + 2fy + c = 0$ at two distinct points then
(a) $c = 0$ (b) $c < 0$ (c) $c > 0$ (d) $c \in R$

81. Find the equation of the circle through the point (-2, 4) and through the points of intersection of the circle $x^2 + y^2 - 2x - 6y + 6 = 0$ and the line $3x + 2y - 5 = 0$
(a) $x^2 + y^2 + 2x - 4y - 4 = 0$ (b) $x^2 + y^2 + 4x - 2y - 4 = 0$
(c) $x^2 + y^2 - 3x - 4y = 0$ (d) $x^2 + y^2 - 4x - 2y = 0$

82. The equation of the circle passing through (1, 0) and (0, 1) and having smallest possible radius is-
(a) $x^2 + y^2 - x - y = 0$ (b) $x^2 + y^2 + x + y = 0$
(c) $x^2 + y^2 - 2x - y = 0$ (d) $x^2 + y^2 - x - 2y = 0$

83. If a circle passes through the points where the lines $3kx - 2y - 1 = 0$ and $4x - 3y + 2 = 0$ meet the coordinate axes then k =
(a) 1 (b) - 1 (c) $\frac{1}{2}$ (d) $-\frac{1}{2}$

84. The area of the triangle formed by the tangent at the point (a, b) to the circle $x^2 + y^2 = r^2$ and the co-ordinates axes is -
(a) $\frac{r^4}{2ab}$ (b) $\frac{r^4}{2|ab|}$ (c) $\frac{r^4}{ab}$ (d) $\frac{r^4}{|ab|}$

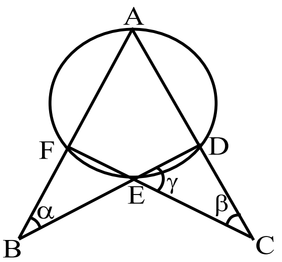
85. Length of the tangent drawn from any point on the circle $x^2 + y^2 + 2gx + 2fy + c_1 = 0$ to the circle $x^2 + y^2 + 2gx + 2fy + c = 0$ is -
(a) $\sqrt{c_1 - c}$ (b) $\sqrt{c - c_1}$
(c) $\sqrt{c_1 + c}$ (d) None

86. If one end of a diameter of the circle $x^2 + y^2 - 4x - 6y + 11 = 0$ is (3, 4), then its other end is
(a) (0, 0) (b) (1, 1) (c) (1, 2) (d) (2, 1)

87. Let AB be a chord of the circle $x^2 + y^2 = r^2$ subtending a right angle at the centre, then the locus of the centroid of the triangle PAB as P moves on the circle is
(a) A parabola (b) A circle
(c) An ellipse (d) None

88. Two tangents PQ and PR drawn to the circle $x^2 + y^2 - 2x - 4y - 20 = 0$ from point P(16, 7). If the centre of the circle is C then area of quadrilateral PQCR will be:
(a) 75 sq. unit (b) 150 sq. unit
(c) 15 sq. unit (d) None of these

89. Consider the figure & find $\alpha + \beta + \gamma$ if $\frac{\alpha}{2} = \frac{\beta}{3} = \frac{\gamma}{2}$



(a) 100^0 (b) 120^0 (c) 140^0 (d) 210^0

90. Number of normal that can be drawn from point of intersection of x-axis & line $2007x + 2008y - 2009 = 0$ to circle $x^2 + y^2 = 2009$
(a) 0 (b) 1 (c) 2009 (d) ∞

91. If the circles described on the line joining the points (0, 1) and (α, β) as diameter cuts the axis of x in points whose abscissae are the roots of the equation $x^2 - 5x + 3 = 0$ the $(\alpha, \beta) =$
(a) (5, 3) (b) (3, 5)
(c) (-5, 3) (d) (3, -5)

92. Tangents OP and OQ are drawn from the origin O to the circle $x^2 + y^2 + 2gx + 2fy + c = 0$. Then the equation of the circumcircle of the triangle OPQ is -
(a) $x^2 + y^2 + 2gx + 2fy = 0$
(b) $x^2 + y^2 + gx + fy = 0$
(c) $x^2 + y^2 - gx - fy = 0$
(d) $x^2 + y^2 - 2gx - 2fy = 0$

93. The equation of a tangent to the circle $x^2 + y^2 = 25$ passing through (-2, 11) is -
(a) $4x + 3y = 25$ (b) $7x - 24y = 320$
(c) $3x + 4y = 38$ (d) $24x + 7y + 125 = 0$

94. The pair of straight line joining the origin to the points of intersection of the line $y = 2\sqrt{2}\,x + c$ and the circle $x^2 + y^2 = 2$ are at right angles, if-
(a) $c^2 - 9 = 0$ (b) $c^2 - 10 = 0$
(c) $c^2 - 4 = 0$ (d) $c^2 - 8 = c$

95. The points (4, -2) & (3, b) are conjugate w.r.t. the circle $x^2 + y^2 - 2x + 4y + 1 = 0$ for
(a) $b \in R$ (b) No value of b
(c) $b \in Q$ (d) None

96. The radius of the circle passing through the centre of the in-circle of ΔABC and through the end points of BC is given by-
(a) $\frac{a}{2}\cos A$ (b) $\frac{a}{2}\sec\frac{A}{2}$
(c) $\frac{a}{2}\sin A$ (d) $a\sec\frac{A}{2}$

97. If a right-angled ΔABC of maximum area is inscribed within a circle of radius R, then-
(a) $\Delta = 2R^2$ (b) $\frac{1}{r_1} + \frac{1}{r_2} + \frac{1}{r_3} = \frac{\sqrt{2}+1}{R}$

(c) $r = (\sqrt{2} - 1)R$ (d) $s = (1 + \sqrt{2})R$

98. The radius of the circle passing through the centre of the in-circle of ΔABC and through the end points of BC is given by-

(a) $\frac{a}{2}\cos A$ (b) $\frac{a}{2}\sec\frac{A}{2}$

(c) $\frac{a}{2}\sin A$ (d) $a\sec\frac{A}{2}$

99. Six points (x_i, y_i), i = 1, 2, …, 6 are taken on the circle $x^2 + y^2 = 4$ such that $\sum_{i=1}^{6} x_i = 8$ and $\sum_{i=1}^{6} y_i = 4$. The line segment joining orthocentre of a triangle made by any three points and the centroid of the triangle made by other three points passes through a fixed points (h, k), then h + k is -

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

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100. In acute angled triangle ABC, $r + r_1 = r_2 + r_3$ and $\angle B > \frac{\pi}{3}$, then

(a) $b + 2c < 2a < 2b + 2c$ (b) $b + 4c < 4a < 2b + 4c$

(c) $b + 4c < 4a < 4b + 4c$ (d) $b + 3c < 3a < 3b + 3c$