Multiple Choice Questions

[MHT-CET 2022]
(online shift)
(Memory Based Questions)

1. A circle passes through the origin and has its centre on the line $y = x$. If it cuts $x^2 + y^2 - 4x - 6y + 10 = 0$ orthogonally, equation of the circle is
   a) $x^2 + y^2 - y - x = 0$ b) $x^2 + y^2 - 2x - 2y = 0$
   c) $x^2 + y^2 + 2x + 2y = 0$ d) $x^2 + y^2 - 6x - 4y = 0$

2. 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
   a) 185 b) 85 c) 95 d) 195

3. The equation of a circle with centre (1, 0) and circumference 10π units is
   a) $x^2 + y^2 - 2x + 24 = 0$ b) $x^2 + y^2 - x - 25 = 0$
   c) $x^2 + y^2 - 2x - 24 = 0$ d) $x^2 + y^2 + 2x + 24 = 0$

4. If the lines $2x - 3y = 5$ and $3x - 4y = 7$ are the diameters of a circle of area 154 sq. units. Then equation of the circle is $\left(Take\ \pi = \frac{22}{7}\right)$
   a) $x^2 + y^2 - 2x + 2y - 47 = 0$ b) $x^2 + y^2 - 2x + 2y - 49 = 0$
   c) $x^2 + y^2 - 2x - 2y - 47 = 0$ d) $x^2 + y^2 - 2x - 2y - 49 = 0$

5. The parametric equations of the circle $x^2 + y^2 - 6x - 2y + 9 = 0$ are
   a) $x = 3 + \sin\theta,\ y = 1 + \cos\theta$ b) $x = 3 + \cos\theta,\ y = 1 + \sin\theta$
   c) $x = 1 + \cos\theta,\ y = 3 + \sin\theta$ d) $x = \cos\theta,\ y = \sin\theta$.

6. The equation of tangents to the circle $x^2 + y^2 = 4$ which are parallel to $x + 2y + 3 = 0$ is
   a) $x + 2y = \pm 2\sqrt{3}$ b) $x + 2y = \pm 2\sqrt{5}$ c) $x - 2y = \pm 2\sqrt{5}$ d) $x - 2y = \pm 2$

7. Given two circles $x^2 + y^2 + 8x - 6y - 24 = 0$ and $x^2 + y^2 - 4x + 10y + 20 = 0$. They are
   a) disjoint b) concentric
   c) touching internally d) touching externally

8. The orthocentre and centroid of a triangle are A (–3, 5) and B (3, 3) respectively. If C is the circumcentre of this triangle, then the radius of circle having line segment AC as a diameter is ..... units.
   a) $2\sqrt{10}$ b) $3\sqrt{10}$ c) $\frac{3\sqrt{5}}{2}$ d) $\frac{2}{\sqrt{10}}$

9. The parametric equations of the curve $x^2 + y^2 - ax - by = 0$ are
   a) $x = \frac{-a}{2} + \sqrt{\frac{a^2+b^2}{4}}\cos\theta,\ y = \frac{b}{2} + \sqrt{\frac{a^2+b^2}{4}}\sin\theta$

b) $x = \frac{a}{2} + \sqrt{\frac{a^2+b^2}{4}}\cos\theta,\ y = \frac{b}{2} + \sqrt{\frac{a^2+b^2}{4}}\sin\theta$

c) $x = \frac{-a}{2} + \sqrt{\frac{a^2+b^2}{4}}\cos\theta,\ y = \frac{-b}{2} + \sqrt{\frac{a^2+b^2}{4}}\sin\theta$

d) $x = \frac{a}{2} + \sqrt{\frac{a^2+b^2}{4}}\cos\theta,\ y = \frac{-b}{2} + \sqrt{\frac{a^2+b^2}{4}}\sin\theta$

10. If the lines $3x - 4y - 7 = 0$ and $2x - 3y - 5 = 0$ pass through diameters of circle of area 49π square units, then the equation of the circle is

a) $x^2 + y^2 + 2x - 2y - 51 = 0$

b) $x^2 + y^2 - 2x + 2y + 51 = 0$

c) $x^2 + y^2 + 2x + 2y + 47 = 0$

d) $x^2 + y^2 - 2x + 2y - 47 = 0$

[MHT-CET 2021]
(online shift)
(Memory Based Questions)

11. The circles $x^2 + y^2 + 6x + 6y = 0$ and $x^2 + y^2 - 12x - 12y = 0$

a) cut orthogonally

b) touch each other internally

c) intersect at two points

d) touch each other externally

12. If the circles $x^2 + y^2 = 9$ and $x^2 + y^2 + 2\propto x + 2y + 1 = 0$ touch each other internally, then $\propto$ is equal to

a) $\pm\frac{4}{3}$

b) 1

c) $\frac{4}{3}$

d) $\frac{-4}{3}$

13. The length of the common chord of the two circles $x^2 + y^2 - 4y = 0$ and $x^2 + y^2 - 8x - 4y + 11 = 0$ is

a) $\frac{\sqrt{145}}{4}$ cm

b) $\frac{\sqrt{11}}{2}$ cm

c) $\sqrt{135}$ cm

d) $\frac{\sqrt{135}}{4}$ cm

14. Area of the equilateral triangle inscribed in the circle $x^2 + y^2 - 7x + 9y + 5 = 0$ is

a) $\frac{155}{8}\sqrt{3}$ square units

b) $\frac{168}{8}\sqrt{3}$ square units

c) $\frac{175}{8}\sqrt{3}$ square units

d) $\frac{165}{8}\sqrt{3}$ square units

15. 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) $\frac{7}{4}$ units

b) $\frac{3}{4}$ units

c) $\frac{4}{3}$ units

d) $\frac{1}{4}$ units

16. The equation of the circle whose centre lies on the line $x - 4y = 1$ and which passes through the points (3, 7) and (5, 5) is

a) $x^2 + y^2 + 6x - 2y + 90 = 0$ b) $x^2 + y^2 - 6x - 2y - 25 = 0$

c) $x^2 + y^2 - 6x + 2y - 30 = 0$ d) $x^2 + y^2 + 6x + 2y - 90 = 0$

17. The equation of a circle that passes through the origin and cut off intercepts -2 and -3 on the X – axis and Y – axis respectively is

a) $x^2 + y^2 - 2x + 3y = 0$ b) $x^2 + y^2 + 2x + 3y = 0$

c) $x^2 + y^2 + 2x - 3y = 0$ d) $x^2 + y^2 - 2x - 3y = 0$

18. If a circle passes through the points (0, 0) $(x, 0)$ and $(0, y)$ then the co-ordinates of its centre are

a) $\left(\frac{-x}{2}, \frac{y}{2}\right)$ b) $\left(\frac{x}{2}, \frac{y}{2}\right)$ c) $\left(\frac{-x}{2}, \frac{-y}{2}\right)$ d) $\left(\frac{x}{2}, \frac{-y}{2}\right)$

19. Equation of the chord of the circle $x^2 + y^2 - 4x - 10y + 25 = 0$ having midpoint (1, 2) is

a) $-x + 3y = 5$ b) $x + 3y = 7$ c) $5x + y = 7$ d) $3x + y = 5$

20. If $y = 2x$ is a chord of circle $x^2 + y^2 - 10x = 0$, then the equation of circle with this chord as diameter is

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

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

[MHT-CET 2020]
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21. If θ is a parameter, then the parametric equations of the circle $x^2 + y^2 - 6x + 4y - 3 = 0$ are given by

a) $x = 3 + 4 \sin\theta$ and $y = 2 + 4 \cos\theta$ b) $x = 3 + 4 \cos\theta$ and $y = -2 + 4 \sin\theta$

c) $x = -3 + 4 \sin\theta$ and $y = -2 + 4 \cos\theta$ d) $x = 3 + 4 \cos\theta$ and $y = 2 + 4 \sin\theta$

22. The Cartesian equation of the curve given by $x = 6 \cos\theta$, $y = 6 \sin\theta$ is

a) $x^2 + y^2 = 6$ b) $x^2 + y^2 = 5$ c) $x^2 + y^2 = 16$ d) $x^2 + y^2 = 36$

23. The equation of the circle whose end points of a diameter are the centres of the circles $x^2 + y^2 + 2x - 4y + 1 = 0$ and $x^2 + y^2 - 8x + 6y + 17 = 0$ is

a) $x^2 + y^2 + 3x - y - 10 = 0$ b) $x^2 + y^2 - 3x - y - 10 = 0$

c) $x^2 + y^2 - 3x + y - 10 = 0$ d) $x^2 + y^2 + 3x + y - 10 = 0$

24. If A $(3, -2, 2)$, B $(2, \lambda + 1, 5)$ are the end points of the diameter of the circle and if the point $(5, 6, -1)$ lies on the circle, then $\lambda =$ .....

a) 8 b) 7 c) 6 d) 5

25. The centre and radius of a circle $x = 4a\left(\frac{1-t^2}{1+t^2}\right)$, $y = \frac{8at}{1+t^2}$ are respectively.

a) (0, 0) and $2a$ units b) (0, 0) and $4a$ units

c) (0, 0) and a units d) (0, 0) and $3a$ units

26. The equation of a circle passing through origin and making x – intercept 3 and y – intercept – 5 is
a) $x^2 + y^2 + 3x - 5y = 0$ b) $x^2 + y^2 - 3x + 5y = 0$
c) $x^2 + y^2 - 3x - 5y = 0$ d) $x^2 + y^2 + 3x + 5y = 0$

27. If the radius of a circle $x^2 + y^2 - 4x + 6y - K = 0$ is 5 then K = ...
a) 12 b) 25 c) – 12 d) – 25

28. The co-ordinates of the midpoint of the chord cut off on the line $2x - 5y + 18 = 0$ by the circle $x^2 + y^2 - 6x + 2y - 54 = 0$ are
a) (4, 1) b) (2, 4) c) (1, 1) d) (1, 4)

29. The radius of the circle passing through the points (5, 7), (2, – 2) and (–2, 0) is
a) 2 units b) 5 units c) 3 units d) 4 units

30. The equation of the circle, the end points of whose diameter are the centres of the circles $x^2 + y^2 - 2x + 3y - 3 = 0$ and $x^2 + y^2 + 6x - 12y - 5 = 0$, is
a) $2x^2 + 2y^2 + 4x + 9y - 24 = 0$ b) $2x^2 + 2y^2 + 4x - 9y + 24 = 0$
c) $2x^2 + 2y^2 + 4x - 9y - 24 = 0$ d) $2x^2 + 2y^2 - 4x - 9y - 24 = 0$

31. The cartesian equation of the curve $x = 3 + 5\cos\theta$ and $y = 2 + 5\sin\theta$ is $(0 \le \theta \le 2\pi)$
a) $x^2 + y^2 + 6x - 4y + 12 = 0$ b) $x^2 + y^2 - 6x + 4y - 12 = 0$
c) $x^2 + y^2 + 6x + 4y + 12 = 0$ d) $x^2 + y^2 - 6x - 4y - 12 = 0$

[MHT-CET 2019]

32. The equation of the circle concentric with the circle $x^2 + y^2 - 6x - 4y - 12 = 0$ and touching the y – axis is
a) $x^2 + y^2 - 6x - 4y - 4 = 0$ b) $x^2 + y^2 - 6x - 4y - 9 = 0$
c) $x^2 + y^2 - 6x - 4y + 9 = 0$ d) $x^2 + y^2 - 6x - 4y + 4 = 0$

33. The intercept on the line $y = x$ by the circle $x^2 + y^2 - 2x = 0$ is AB. The equation of the circle with AB as a diameter is
a) $x^2 + y^2 - x - y = 0$ b) $x^2 + y^2 + 3x - y = 0$
c) $x^2 + y^2 + x + y = 0$ d) $x^2 + y^2 - 3x + y = 0$

34. The parametric equations of the circle $x^2 + y^2 + 2x - 4y - 4 = 0$ are
a) $x = 1 + 3\cos\theta, y = 2 + 3\sin\theta$ b) $x = 1 + 3\cos\theta, y = -2 + 3\sin\theta$
c) $x = -1 + 3\cos\theta, y = -2 + 3\sin\theta$ d) $x = -1 + 3\cos\theta, y = 2 + 3\sin\theta$

35. If the radius of the circle $x^2 + y^2 - 18x + 12y + k = 0$ is 11 units, then the value of k is
a) – 3 b) 4 c) 3 d) – 4

36. If (a, b) and (4, 3) are end – points of a diameter of the circle $x^2 + y^2 + 4x - 6y + 11 = 0$, then (a, b) = ...
a) (– 8, 3) b) (8, 3) c) (8, – 3) d) (– 8, –3)

[MHT-CET 2023]

37. Let a circle passes through points (4, 0) and (0, 2) and its centre lies on y-axis. If the radius of this circle is r, then the value of $r^2 - r + 1$ is]
a) 10 b) 11 c) 20 d) 21

38. If λ is the perpendicular distance of a point P on the circle $x^2 + y^2 + 2x + 2y - 3 = 0$ from the line $2x + y + 13 = 0$, then maximum possible value of λ is
a) $\sqrt{5}$ b) $2\sqrt{5}$ c) $3\sqrt{5}$ d) $4\sqrt{5}$