CIRCLES

SINGLE CORRECT OPTION TYPE

1. A point moves so that sum of the squares of its distances from the 4 sides of a square is constant. The locus of the point is
(A) circle (B) ellipse (C) hyperbola (D) none of these

2. A variable circle passes through $P(1,2)$ and touches the x-axis. The locus of other end of diameter through 'P' is
(A) $(x-1)^2=8y$ (B) $(x+1)^2=8y$ (C) $(y-1)^2=8x$ (D) $(y+1)^2=8x$

3. If $(k+1,k)$ lies inside the region bounded by curve and y-axis, then 'k' belongs to interval, $x=\sqrt{25-y^2}$
(A) $(-1,3)$ (B) $(-4,3)$ (C) $(-\infty,-4)\cup(3,\infty)$ (D) none of these

4. If a circle passes through the points of intersection of the coordinate axes with the lines $\lambda x-y+1=0$ and $x-2y+3=0$ then unit digit of λ^{2020} is
(A) 2 (B) 4 (C) 6 (D) 8

5. The locus of midpoint of chord of the circle $x^2+y^2-2x-2y-2=0$ which makes an angle of 120° at the centre is
(A) $x^2+y^2-2x+2y-1=0$ (B) $x^2+y^2-2x-2y+1=0$
(C) $x^2+y^2+x+y-1=0$ (D) $x^2+y^2-2x-2y-1=0$

6. Two distinct chords drawn from point (p,q) on the circle $x^2+y^2=px+qy$, $pq\neq 0$ are bisected by the x-axis. Then
(A) $|p|=|q|$ (B) $p^2=8q^2$ (C) $p^2<8q^2$ (D) $p^2>8q^2$

7. The equation of smallest circle passing through intersection of line $x+y=1$ and circle $x^2+y^2=9$ is
(A) $x^2+y^2+x+y-8=0$ (B) $x^2+y^2-x-y-8=0$
(C) $x^2+y^2-x-y+8=0$ (D) none of these

8. If the locus of a point which moves so that the line joining the points of contact of tangents drawn from it to the circle $x^2+y^2=b^2$ touches $x^2+y^2=a^2$ is $x^2+y^2=c^2$, then a, b, c are in
(A) A.P. (B) G.P. (C) H.P. (D) none of these

9. A line meets the coordinate axes in A and B. A circle is circumscribed about ΔAOB. If m, n are distances of tangent to the circle at the origin from the points A and B respectively, the diameter of circle is
(A) $m(m+n)$ (B) $m+n$ (C) $n(m+n)$ (D) $\frac{m}{m+n}$

10. The base AB of a triangle is fixed and its vertex 'C' moves such that $\sin A=k\sin B(k\neq 1)$. If 'a' is length of base AB, then the locus of 'C' is a circle whose radius is equal to
(A) $\frac{ak}{2-k^2}$ (B) $\frac{ak}{1-k^2}$ (C) $\frac{2ak}{1-k^2}$ (D) none of these

11. If a square is inscribed in the circle $x^2+y^2-2x+4y+3=0$ and its sides are parallel to coordinate axes, then one vertex of square is

(A) $\left(1+\sqrt{2},-2\right)$ (B) $\left(1-\sqrt{2},-2\right)$ (C) $\left(1,-2+\sqrt{2}\right)$ (D) none of these

12. If $-3l^2-6l-1+6m^2=0$ then the equation of circle for which $lx+my+1=0$ is a tangent is

(A) $(x+3)^2+y^2=6$ (B) $(x-3)^2+y^2=6$ (C) $x^2+(y-3)^2=6$ (D) $x^2+(y+3)^2=6$

13. An infinite number of tangents can be drawn from $(1,2)$ to the circle $x^2+y^2-2x-4y+\lambda=0$ then $\lambda=$

(A) – 20 (B) 0 (C) 5 (D) can't be determined

14. The equation of circle having the lines $x^2+2xy+3x+6y=0$ as its normal and having size just sufficient to contain the circle $x(x-4)+y(y-3)=0$ is

(A) $x^2+y^2+3x-6y-40=0$ (B) $x^2+y^2+6x-3y-45=0$

(C) $x^2+y^2+8x+4y-20=0$ (D) $x^2+y^2+4x+8y+20=0$

15. Angle between tangents drawn to $x^2+y^2-2x-4y+1=0$ at the points where it is cut by the line $y=2x+c$ is $\frac{\pi}{2}$, then

(A) $|c|=\sqrt{5}$ (B) $|c|=2\sqrt{5}$ (C) $|c|=\sqrt{10}$ (D) $|c|=2\sqrt{10}$

16. Two rods of length 'a' and 'b' slide along x and y-axis respectively in such a manner that their ends are concyclic. The locus of centre of circle passing through the end points is

(A) $4\left(x^2+y^2\right)=a^2+b^2$ (B) $x^2+y^2=a^2+b^2$

(C) $4\left(x^2-y^2\right)=a^2-b^2$ (D) $x^2-y^2=a^2-b^2$

17. If OA and OB be tangents to $x^2+y^2-6x-8y+21=0$ drawn from origin (O), AB equals to

(A) 11 (B) $\frac{4\sqrt{21}}{5}$ (C) $\sqrt{\frac{17}{3}}$ (D) $\frac{4}{5}$

18. A circle of C_1 of radius '2' touches both x and y axis. Circle C_2 whose radius is greater than '2' touches circle C_1 and both axes. Radius of C_2 is

(A) $6+4\sqrt{2}$ (B) $6-4\sqrt{2}$ (C) $6-4\sqrt{3}$ (D) $6+4\sqrt{3}$

19. If $a>2b>0$ then the positive value of m for which $y=mx-b\sqrt{1+m^2}$ is a common tangent to $x^2+y^2=b^2$ and $(x-a)^2+y^2=b^2$ is

(A) $\frac{\sqrt{a^2-4b^2}}{2b}$ (B) $\frac{2b}{\sqrt{a^2-4b^2}}$ (C) $\frac{2a}{a-2b}$ (D) $\frac{b}{a}-2b$

20. The angle of intersection of curves $r=\sin\theta+\cos\theta$ and $r=2\sin\theta$ is equal to

(A) $\frac{\pi}{2}$ (B) $\frac{\pi}{3}$ (C) $\frac{\pi}{4}$ (D) none of these

INTEGER TYPE

21. If two circles $x^2+y^2=4$ and $x^2+y^2-24x-10y+a^2=0$, $a\in z$, have exactly two common tangents, then the number of possible values of 'a' is _____.

22. If the circle $x^2+y^2+6x+8y+a=0$ bisects the circumference of circle $x^2+y^2+2x-6y-b=0$, then $|a+b|$ is _____.

23. The distance from the centre of circle $x^2+y^2=2x$ to straight line passing through the points of intersection of two circles $x^2+y^2+5x-8y+1=0$ and $x^2+y^2-3x-7y+25=0$ is _____.

24. Let x, y be real variable satisfying $x^2+y^2+8x-10y-40=0$. Let $a=\max\left\{(x+2)^2+(y-3)^2\right\}$, $b=\min\left\{(x+2)^2+(y-3)^2\right\}$ then $(a+b)^2$ is _____.

25. Let ABCD be quadrilateral with area 18, with $AB\parallel CD$ and $AB=2CD$. $AD\perp AB$ and $AD\perp CD$. If a circle is drawn inside the quadrilateral ABCD touching all the sides, then its radius is _____.

KEY

1.	A	**2.**	A	**3.**	A	**4.**	C	**5.**	B
6.	D	**7.**	B	**8.**	B	**9.**	B	**10.**	B
11.	D	**12.**	B	**13.**	C	**14.**	B	**15.**	C
16.	C	**17.**	B	**18.**	A	**19.**	B	**20.**	C
21.	13	**22.**	38	**23.**	2	**24.**	324	**25.**	2

✻ *Wish You all the Best* ✻