

# CHAPTER 8- Circles

EE24BTECH11021 - Eshan Ray

## SECTION-A [*JEEADVANCED/IIT – JEE*]

### A:FILL IN THE BLANKS

- 1) If A and B are points in the plane such that  $\frac{PA}{PB} = K(\text{constant})$  for all P on a given circle, then the value of K cannot be equal to.....  
(1982 – 2Marks)
- 2) The points of intersection of the line  $4x - 3y - 10 = 0$  and the circle  $x^2 + y^2 - 2x + 4y - 20 = 0$  are.....and.....  
(1983 – 2Marks)
- 3) The lines  $3x - 4y + 4 = 0$  and  $6x - 8y - 7 = 0$  are tangents to the same circle. The radius of the circle is.....  
(1984 – 2Marks)
- 4) Let  $x^2 + y^2 - 4x - 2y - 11 = 0$  be a circle. A pair of tangents from the point (4, 5) with a pair of radii form a quadrilateral of area.....  
(1985 – 2Marks)
- 5) From the origin chords are drawn to the circle  $(x - 1)^2 + y^2 = 1$ . The equation of the locus of the mid-points of these chords is.....  
(1985 – 2Marks)
- 6) The equation of the line passing through the points of intersection of the circles  $3x^2 + 3y^2 - 2x + 12y - 9 = 0$  and  $x^2 + y^2 + 6x + 2y - 15 = 0$  is.....  
(1986 – 2Marks)
- 7) From the point A (0, 3) on the circle  $x^2 + 4x + (y - 3)^2 = 0$ , a chord AB is drawn and extended to a point M such that  $AM = 2AB$ . The equation of the locus of M is .....  
(1986 – 2Marks)
- 8) The area of the triangle formed by the tangents from the point (4, 3) to the circle  $x^2 + y^2 = 9$  and the line joining their point of contact is.....  
(1987 – 2Marks)
- 9) If the circle  $C_1 : x^2 + y^2 = 16$  intersects another circle  $C_2$  of radius 5 in such a manner that common chord is of maximum length and has a slope equal to  $\frac{3}{4}$ , then the coordinates of the centre of  $C_2$  are.....  
(1988 – 2Marks)
- 10) The area formed by the positive x-axis and the normal and the tangent to the circle  $x^2 + y^2 = 4$  at  $(1, \sqrt{3})$  is.....  
(1989 – 2Marks)
- 11) 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 the value of  $\lambda =$ .....  
(1991 – 2Marks)
- 12) The equation of the locus of the mid-points of the circle  $4x^2 + 4y^2 - 12x + 4y + 1 = 0$  that subtend an angle of  $\frac{2\pi}{3}$  at its centre is.....  
(1993 – 2Marks)
- 13) The intercept of the line  $y = x$  by the circle  $x^2 + y^2 - 2x = 0$  is AB. Equation of the circle with AB as a diameter is.....  
(1996 – 1Mark)
- 14) For each natural number k, let  $C_k$  denote the circle with radius k centimetres and centre at the origin. On the circle  $C_k$ ,  $\alpha$  - particle moves k centimetres in the counter-clockwise direction. After completing its motion on  $C_k$ , the particle moves to  $C_{k+1}$  in the radial direction. The motion of the particle continues in this manner. The particle starts at (1, 0). If the particle crosses the positive direction of the x-axis for the first time on the circle  $C_n$  then n=.....  
(1997 – 2Marks)
- 15) The chords of contact of the pair of tangents drawn from each point on the line  $2x + y = 4$  to  $x^2 + y^2 = 1$  pass through the point.....  
(1997 – 2Marks)