1. If the equation $\lambda x^2 + (2\lambda - 3)y^2 - 4x - 1 = 0$ represents a circle, then its radius is

(1) $\frac{\sqrt{11}}{3}$
(2) $\frac{\sqrt{13}}{3}$
(3) $\frac{\sqrt{7}}{3}$
(4) $\frac{1}{3}$

2. The equation of the circle passing through $(2, 0)$ and $(0, 4)$ and having the minimum radius is

(1) $x^2 + y^2 = 20$
(2) $x^2 + y^2 - 2x - 4y = 0$
(3) $x^2 + y^2 = 4$
(4) $x^2 + y^2 = 16$

3. Let $\mathrm{P}(\mathrm{x}_1, \mathrm{y}_1)$ and $\mathrm{P}(\mathrm{x}_2, \mathrm{y}_2)$ are two points such that their abscissas x_1 and x_2 are the roots of the equation $\mathrm{x}^2 + 2\mathrm{x} - 3 = 0$ while the ordinates y_1 and y_2 are the roots of the equation $\mathrm{y}^2 + 4\mathrm{y} - 12 = 0$.Then the centre of the circle with PQ as diameter is

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

4. The equation of circle which passes through the origin and cuts off intercepts 5 and 6 from the positive parts of the axes respectively, is $\left(x - \frac{5}{2}\right)^2 + (y - 3)^2 = \lambda$, where λ is

(1) $\frac{61}{4}$
(2) $\frac{6}{4}$
(3) $\frac{1}{4}$
(4) 0

5. The length of the diameter of the circle which touches the $X-$axis at the point $(1,\ 0)$ and passes through the point $(2,\ 3)$ is

(1) $\frac{6}{5}$
(2) $\frac{5}{3}$
(3) $\frac{10}{3}$
(4) $\frac{3}{5}$

6. A circle passes through $(-2, 4)$ and touches the $y-$axis at $(0, 2)$. Which one of the following equations can represent a diameter of this circle ?

(1) $2x - 3y + 10 = 0$
(2) $3x + 4y - 3 = 0$
(3) $4x + 5y - 6 = 0$
(4) $5x + 2y + 4 = 0$

7. If a circle passing through the point$(-1,\ 0)$ touches y-axis at $(0,\ 2)$, then the x-intercept of the circle is

(1) $\frac{5}{2}$
(2) 5
(3) $\frac{3}{2}$
(4) 3

8. Let the lengths of intercepts on x -axis and y -axis made by the circle $x^2 + y^2 + ax + 2ay + c = 0$, $(a < 0)$ be $2\sqrt{2}$ and $2\sqrt{5}$, respectively. Then the shortest distance from origin to a tangent to this circle which is perpendicular to the line $x + 2y = 0$, is equal to :

(1) $\sqrt{11}$
(2) $\sqrt{7}$
(3) $\sqrt{6}$
(4) $\sqrt{10}$

9. If the points $(2, 0)$, $(0, 1)$, $(4, 5)$ and $(0, k)$ are con-cyclic, then the value of k is

(1) 1
(2) $\frac{14}{3}$
(3) 5
(4) none of these

10. The least and greatest distances of the point $(10, 7)$ from the circle $x^2 + y^2 - 4x - 2y - 20 = 0$ are

(1) $10, 5$
(2) $15, 20$
(3) $12, 16$
(4) $5, 15$