

VERY SHORT ANSWER TYPE QUESTIONS

Attempt **ALL** questions. Each question carries **2** marks.

1. Find the equation of the circle passing through the origin and has centre at $(-4, -3)$.
2. Find the equation of the sphere passing through $(0, 0, 0)$, $(a, 0, 0)$, $(0, b, 0)$, $(0, 0, c)$.
3. Find the equation of the parabola whose focus is $(3, 1)$ and vertex is $(3, -2)$.
4. One focus of a hyperbola is located at the point $(1, -3)$ and the corresponding directrix is the line $y = 2$. Find the equation of the hyperbola if its eccentricity is $\frac{3}{2}$.
5. If $y = ax^2 + 3b/x$ then show that $x^2 y_2 = 2y_1$.
6. Evaluate $\int \cot^2 x \, dx$.
7. Evaluate $\int x e^x \, dx$.
8. Evaluate $\int_0^2 \sqrt{4-x^2} \, dx$.
9. State the trapezoidal rule for numerical integration of a function $f(x)$ over the interval $[a, b]$ by dividing $[a, b]$ into n subintervals.
10. Solve $\frac{dy}{dx} = \frac{x-y+2}{x+y-1}$.

SECTION - B

5 × 4 = 20

SHORT ANSWER TYPE QUESTIONS

Attempt **any 5** questions. Each question carries **4** marks.

11. Find the equation of the circle passing through $(1, 1)$, $(2, -1)$, $(3, 2)$.
12. Find the equation of the parabola whose focus is $(3, -2)$ and directrix is $3x + 2y - 4 = 0$.
13. Find the centre, eccentricity, vertices, foci and the equations of directrices of the ellipse $x^2 + 2y^2 - 4x + 12y + 14 = 0$.