

SECTION-B

2. Trace the curve $y = x + 1/x$.
3. Find the area above the x-axis included between the curves $y^2 = 2ax - x^2$, $y^2 = ax$.
4. If $u = x^2 \tan^{-1} \frac{y}{x} - y^2 \tan^{-1} \frac{x}{y}$, then evaluate $x^2 \frac{\partial^2 u}{\partial x^2} + 2xy \frac{\partial^2 u}{\partial x \partial y} + y^2 \frac{\partial^2 u}{\partial y^2}$.
5. Find the point on the surface $z^2 = xy + 1$ nearest to the origin.

SECTION-C

6. Find the equation of the circular cylinder having for its base the circle $x^2 + y^2 + z^2 = 9$,
 $x - y + z = 3$
7. Find the area between the parabolas $y^2 = 4ax$ and $x^2 = 4ay$
8. Test the convergence of the series $\frac{1}{1} + \frac{3}{7}x + \frac{3.6}{7.10}x^2 + \frac{3.6.9}{7.10.13}x^3 + \dots \infty$
9. If $\tan \frac{x}{2} = \tan h \frac{u}{2}$, then prove that $\tan x = \sinh u$, $\cos x \cosh u = 1$.