

श्री अरिमा विश्वविद्यालय इन्डोर
(Regular) छात्रों के लिए

Class: BCA I Semester

Paper: Mathematics - I

Attempt all the five questions. Each question carry equal marks.

Q.1. (a) Evaluate $\lim_{x \rightarrow 2} \frac{x^3 - 8}{x^2 - 4}$

(b) Show that the functions $f(x) = x \sin\left(\frac{1}{x}\right)$, $x \neq 0$; $f(0) = 0$, is not differential at $x = 0$

Q.2. (a) Expand $e^{x \cos x}$ by Maclaurin's theorem.

(b) Expand $\log_e x$ in power of $(x-1)$ by Taylor's theorem.

Q.3. Find asymptotes of the curve

$$y^3 - x^2y - 2xy^2 + 2x^3 - 7xy + 3y^2 + 2x^2 + 2y + 1 = 0$$

Q.4. If $\bar{A} = t^2\hat{i} - t\hat{j} + (2t+1)\hat{k}$ & $\bar{B} = (2t-3)\hat{i} + \hat{j} - t\hat{k}$

Find

i) $\frac{d}{dt} (\bar{A} \cdot \bar{B})$ ii) $\frac{d}{dt} (\bar{A} \times \bar{B})$ iii) $\frac{d}{dt} |\bar{A} + \bar{B}|$

Q.5. Solve following equations with the help of matrix method

$$x + 2y + 3z = 14, \quad 3x + y + 2z = 11, \quad 2x + 3y + z = 11$$