

B.B.A. Semester - 2 (CBCS) Examination**March/April – 2025 (New Course)****Advanced Techniques of Business Mathematics (ALLIED)****Time: 2.30 Hours****Marks: 70****Instructions:**

1. All questions are compulsory.
2. Figures to the right indicate marks.

- Que.1(A) Solve the equations: (use Cramer's rule) (07)
 $3x + 5y + 6z = 4, \quad x + 2y + 3z = 2, \quad 2x + 4y + 5z = 3$
- Que.1(B) Write rules of determinant. (07)
- OR
- Que.1(A) Find the value of $\begin{vmatrix} 4 & 45 & 55 \\ 2 & 29 & 32 \\ 6 & 68 & 87 \end{vmatrix}$ (07)
- Que.1(B) Find the value of $\begin{vmatrix} x+y & x \\ x & x-y \end{vmatrix}$ (07)
- Que.2(A) Define the following matrices: (07)
- 1) Null matrix
 - 2) Row matrix
 - 3) Symmetric matrix
 - 4) Unit matrix
 - 5) Diagonal matrix
- Que.2(B) If $A^{-1} = \begin{bmatrix} 1 & 3 & 3 \\ 1 & 4 & 3 \\ 1 & 3 & 4 \end{bmatrix}$, find A (07)
- OR
- Que.2(A) If $A = \begin{bmatrix} 2 & 3 \\ 1 & 4 \end{bmatrix}$ and $B = \begin{bmatrix} 5 & 1 \\ 0 & 3 \end{bmatrix}$ Find AB and BA. Is $AB=BA$? (07)
- Que.2(B) Find inverse of the following matrices: (07)
- (i) $A = \begin{bmatrix} 2 & 3 \\ 4 & 10 \end{bmatrix}$
 - (ii) $B = \begin{bmatrix} 5 & 1 \\ 4 & 2 \end{bmatrix}$
- Que.3 Find limit value (Any Five) (14)
- 1) $\lim_{n \rightarrow \infty} \frac{n^2 - n + 3}{2n^2 + 1}$
 - 2) $\lim_{x \rightarrow \infty} \frac{2x^2 + 4x - 9}{3x^2 + 8x + 11}$
 - 3) $\lim_{x \rightarrow -2} \frac{9x^2 + 5x - 26}{5x^2 + 17x + 14}$
 - 4) $\lim_{x \rightarrow 2} \frac{x^4 - 16}{x^3 - 8}$
 - 5) (1) $\lim_{x \rightarrow \infty} \frac{\sum n}{n^2}$
 - 6) $\lim_{x \rightarrow 4} \frac{x^2 - 5x + 4}{x^2 - 2x - 8}$
- Que.4 Find $\frac{dy}{dx}$ (Any Four) (14)
- 1) $y = (x + a)(x + b)(x + c)$
 - 2) $y = x^x$
 - 3) $y = \frac{3^x}{x^3}$
 - 4) $y = e^{(2x+1)^3}$
 - 5) $y = (2x-4)(5x+7)$
 - 6) $y = (x-1)(x-2)(x-3)$
- Que.5(A) Give difference between simple interest and compound interest. (07)
- Que.5(B) Write short note on: Sinking Fund (07)
- OR
- Que.5(A) Mr. M deposited Rs. 12000 at a 12% compounded yearly for 6 years in a finance company. Find the amount of the compound interest. (07)
- Que.5(B) Find the simple interest on Rs. 10000 at 12% for 4 years. (07)
