



DX-161100010203

Seat No. _____

B. B. A. (Sem. II) (CBCS) (W.E.F. 2016) Examination

April - 2022

Advance Techniques of Business Mathematics

(Old Course)

Time : $2\frac{1}{2}$ Hours]

[Total Marks : 70

- Instructions :** (1) Attempt any five questions.
(2) Each question carries equal marks.

- 1 Solve the following equations using Cramer's rule. 14
 $2x + y + z = 2, x + y + 3z = 3, 3x + y + 2z = 4$
- 2 (a) Explain the rules of determinant. 7
- (b) Prove that $\begin{vmatrix} 0 & ab^2 & ac^2 \\ a^2b & 0 & bc^2 \\ a^2c & b^2c & 0 \end{vmatrix} = 2a^3b^3c^3$. 7
- 3 (a) Define following matrices with example : 7
(1) Column matrix
(2) Null matrix
(3) Unit matrix
(4) Transpose of a matrix
- (b) If $A = \begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}, B = \begin{bmatrix} 2 & 3 \\ 4 & 5 \end{bmatrix}$, prove that (1) $(A+B)' = A'+B'$ 7
(2) $(AB)' = B'A'$.
- 4 Solve the following equations using inverse matrix : 14
 $x + y + 2z = 6, 3x + y + z = 6, x + 2y + z = 5$
- 5 (a) State the working rules of limit. 7
(b) Explain meaning of $x \rightarrow a, x \rightarrow 0, x \rightarrow \infty$. 7

6 Evaluate the following limits : **14**

(1) $\lim_{x \rightarrow \infty} \left(1 + \frac{3}{x}\right)^x$

(2) $\lim_{x \rightarrow 5} \frac{x^2 - 7x + 10}{x - 5}$

(3) $\lim_{x \rightarrow 4} \frac{x^2 - 16}{x - 4}$

(4) $\lim_{n \rightarrow \infty} \frac{2n^3 + 5n + 3}{n^3 + 2n + 1}$

7 (a) If $f(x) = x^2 - 2x + 2$ and $f(x) = f'(x)$, find x . **7**

(b) If $y = \frac{x^2}{1+x^2}$ P. T. $(x^2 + 1) \frac{dy}{dx} = \frac{2y}{x}$. **7**

8 Find $\frac{dy}{dx}$: **14**

(1) $y = (2x + 3)^5$

(2) $y = (x^2 + 1)(x + 1)$

(3) $y = x \log x$

(4) $y = \frac{x^4 - 1}{x^2 + 1}$

9 Explain : **14**

(1) Simple interest and Compound interest.

(2) Annuity.

10 Find the compound amount of Rs. 2,000 for 2 years at **14**

10% converted.

(1) Annually

(2) Semiannually

(3) Quarterly

(4) Monthly