DCA-19BBA203

Seat No. _____

B. B. A. (Sem. II) (CBCS) (W.E.F. 2019) Examination

July - 2022

Advance Techniques of Business Mathematics

(New Course)

Time : $2\frac{1}{2}$ Hours] [Total Marks : **70**

Instruction : Attempt all questions.

1 (a) Explain the rules of determinant with example. **10**

(b) Prove that **10**

$$\begin{vmatrix} (x+1)^2 & x^2+1 & x \\ (y+1)^2 & y^2+1 & y \\ (z+1)^2 & z^2+1 & z \end{vmatrix} = 0$$

OR

1 Solve the following equations by Crammer's method : **20**

$x + y + z = 6$

$2x + y + z = 7$

$x + 2y + z = 8$

2 (a) Define the following with example : **10**

(i) Unit matrix

(ii) Transpose of a matrix

(iii) Inverse matrix

(iv) Square matrix

(b) If $A = \begin{bmatrix} 2 & 6 \\ 7 & 2 \end{bmatrix}$, $B = \begin{bmatrix} -3 & 5 \\ 0 & 8 \end{bmatrix}$, $C = \begin{bmatrix} 4 & 7 \\ 9 & 5 \end{bmatrix}$ prove that **10**

$A(BC) = (AB)C$.

OR

2 Solve the following equations by Matrix Inversion method **20**

$2x + 3y - z = 5$

$3x + 2y + z = 10$

$x - 5y + 3z = 0$

3 Obtain the following limits : (any **five**) **15**

(i) $\lim_{x \to 4} \frac{x^2 - 3x - 4}{x^2 - 2x - 8}$

(ii) $\lim_{x \to 5} \frac{x^3 - 125}{x^2 - 25}$

(iii) $\lim_{x \to 0} \frac{2^{4x} - 3^{2x}}{x}$

(iv) $\lim_{n \to \infty} \left(1 + \frac{9}{n}\right)^n$

(v) $\lim_{x \to 0} \frac{e^{8x} - e^{7x}}{x}$

(vi) $\lim_{x \to 0} \frac{a^{5x} + a^{2x} - 2}{x}$

(vii) $\lim_{x \to 0} \frac{\sqrt{1+x} - 1}{x}$

4 (a) Define the following : **7**

(i) Simple interest.

(ii) Compound interest.

(iii) Effective rate of interest.

(b) What is Annuity? Derive the formula of annuity. 8

OR

4 (a) If Rs. 10,000 is invested at 6% compounded **7**

(i) half yearly, (ii) quarterly, (iii) monthly for 2 years find the amount of each period.

(b) A machine is available in Rs. 80,000 or by leasing it for 5 years at an annual rent of Rs. 20,000. If money can be borrowed at 14% per annum, is it advisable to go for leasing? 8