Seat No. _____

HS-161100010203

B. B. A. (Sem. II) (CBCS)
(W.E.F. 2016) Examination
May - 2023
Advance Techniques of Business Mathematics
(Old Course)

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

Instructions : (1) Attempt all questions.

(2) Each question carries equal marks.

1 (a) Explain any three rules of determinant : 7

(b) Find the value of K if : 7

$$\begin{vmatrix} 4 & 5 & -7 \\ -2 & K & 6 \\ 1 & K & 1 \end{vmatrix} = 43$$

OR

1 Solve the following equations by Cramer's Method : 14

$2x + 3y - z = 5$

$3x + 2y + z = 10$

$x - 5y + 3z = 0$

2 (a) Define the following : 7

(i) Square Matrix (ii) Zero Matrix

(iii) Identity Matrix

(b) If $A = \begin{bmatrix} 6 & 3 \\ 4 & 5 \end{bmatrix}$ then find and A^{-1} and verify that A.A^{-1} =I 7

OR

2 Prove that : **14**

$$A = \begin{bmatrix} 1 & 2 & 2 \\ 2 & 1 & 2 \\ 2 & 2 & 1 \end{bmatrix}$$ Satisfies the following equation.

$A^2 - 4A - 5I = O$ where **O** is the null matrix and **I** is the identity

matrix.

3 Find the following limits : (any **four**) **14**

(i) $\lim\limits_{x \to 2} \dfrac{x^4 - 16}{x^3 - 8}$

(ii) $\lim\limits_{x \to 0} \dfrac{e^{4x} - e^{3x}}{x}$

(iii) $\lim\limits_{x \to 0} \dfrac{9^{5x} + 9^{2x} - 2}{x}$

(iv) $\lim\limits_{n \to \infty} \left(1 + \dfrac{2}{n}\right)^n$

(v) $\lim\limits_{x \to 0} \dfrac{7^x - 5^x}{x}$

(vi) $\lim\limits_{x \to 4} \dfrac{x^2 - 5x + 4}{x^2 - 2x - 8}$

4 Find the derivaties of the following : (Any **Four**) **14**

(i) $\dfrac{2x^3 - 3}{x^2 + 7}$

(ii) $(3x^2 - 2)(x^2 + 7)$

(iii) $e^{5x^2 - 9x + 1}$

(iv) $3^{2x^2 + 7x + 1}$

(v) $Log(3x + 5)$

(iv) $(x^2 + 12x + 7)^5$

5 (a) Define the terms : **7**

     (i) Simple Interest (ii) Compund Interest

     (iii) Sinking fund

  (b) Define Annuity. Find the formula of Annuity. **7**

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OR

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5 (a) A machine is available in Rs.5000 or by leasing it for 7

5 years at an annual rent of Rs.1200. If money can be borrowed at 12% per annum, is it advisable to go for leasing ?

(b) A person deposits Rs.400 at the end of every month. The 7

rate of interest is 12% compounded monthly. Find the total amount he will receive after 35 years. [Take $(1.01)^{420} = 63.97$)

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