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

July - 2022

Advance Techniques of Business Mathematics

(Old Course)

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

Instructions : (1)   Attempt all five questions.

(2)   Each question carries equal marks.

(3)   Marks are indicated on right side.

1   Solve the following equations using Crammer's rule.   **14**

$3x + y + 2z = 7, x + 2y + 3z = 8, 2x + 3y + z = 9$

OR

1   (a)   State the rules of determinant.   **7**

(b)   Solve $\begin{vmatrix} x & 3 & 5 \\ 2 & 7 & 8 \\ 6 & 3 & 5 \end{vmatrix} = 0.$ **7**

2   Solve the following equations using inverse matrix.   **14**

$x + y + 2z = 6, 3x + y + z = 6, x + 2y + z = 5$

OR

2   (a)   Define the following matrices with example.   **7**

(1)   Unit matrix

(2)   Zero matrix

(3)   Column matrix

(b)   If $A = \begin{bmatrix} 3 & 1 \\ -1 & 2 \end{bmatrix}$ prove that $A^2 - 5A + 7I_2 = 0.$ **7**

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

(1) $\lim\limits_{x \to 1} \dfrac{7x^2 - 5x + 6}{x^2 - 2x + 3}$ (2) $\lim\limits_{x \to 5} \dfrac{x^2 - 7x + 10}{x - 5}$

(3) $\lim\limits_{n \to \infty} \dfrac{2n^3 + 5n + 3}{n^3 + 2n + 1}$ (4) $\lim\limits_{x \to \infty} \left(1 + \dfrac{2}{x}\right)^x$

(5) $\lim\limits_{x \to 4} \dfrac{x^2 - 16}{x - 4}$ (6) $\lim\limits_{x \to 0} \dfrac{8^x - 2^x}{x}$

4 Find $\dfrac{dy}{dx}$: (any **four**)   **14**

(1) $y = \left(x^2 + 1\right)(x + 1)$ (2) $y = \left(\sqrt{x} + \dfrac{1}{\sqrt{x}}\right)\left(\sqrt{x} - \dfrac{1}{\sqrt{x}}\right)$

(3) $y = e^{3x + 1}$ (4) $y = (2x + 3)^5$

(5) $y = \dfrac{x^2 - 1}{x^2 + 1}$ (6) $y = x \log x$

5 Explain :   **14**
    (1)   Simple Interest and Compound Interest.
    (2)   Annuity and Sinking Fund.

<div align="center">OR</div>

5 Find the compound amount of Rs. 2,000 for 2 years at   **14**
10% converted (1) Annually, (2) Semiannually (3) Quarterly,
(4) Monthly.