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Total No. of Questions: 09

Total No. of Pages: 02

BBA/BRDM Bachelor in Service industry Management (SIM) (Sem. 2)

BUSINESS MATHEMATICS

Subject Code: BBA-203

Paper ID: C0242

Time: 03 Hrs.

Max. Marks: 60

INSTRUCTION TO CANDIDATES:

1. Section A is **COMPULSORY** consisting of **TEN** Questions carrying **TWO** marks each.
2. Attempt any **ONE** question from each unit in Section B. Each questions carrying **TEN** marks.

SECTION A

1.
 - a) Define Null Set.
 - b) What do you mean by Inverse of Matrices?
 - c) Define Skew symmetric Matrices.
 - d) What do mean by Differentiation from first principle?
 - e) Briefly explain union of two sets.
 - f) Define Venn Diagram.
 - g) Define Cofactors.
 - h) Define Binomial Theorem.
 - i) Define Triangular Matrix
 - j) Simplify $\log_a b \log_b c \log_c d \log_d a$

SECTION B

UNIT I

2.
 - (a) A market research group conducted a survey of 1000 consumers and reported that 720 consumers liked product A and 450 consumers liked product B. What is the least number that must have liked both products?
 - (b) Let A, B, C be three sets and prove $A \times (B \cap C) = (A \times B) \cap (A \times C)$
3.
 - (a) Explain De Morgan's Law.
 - (b) If $A = \begin{pmatrix} 0 & 1 \\ 1 & 0 \end{pmatrix}$ $B = \begin{pmatrix} 0 & -i \\ 1 & 0 \end{pmatrix}$ show that $AB = -BA$ and $A^2 = B^2 = 1$.

UNIT II

4. Verify the associative law $A(BC) = (AB)C$ for the following matrices

$$A = \begin{bmatrix} 1 & 1 & 1 \\ 2 & 2 & 2 \\ 3 & 3 & 3 \\ 0 & 0 & 0 \end{bmatrix},$$

$$B = \begin{pmatrix} 1 & 0 & -1 \\ 0 & -1 & 1 \\ -1 & 1 & 0 \end{pmatrix}, C = \begin{pmatrix} -1 & -1 \\ 2 & 2 \\ 1 & 1 \end{pmatrix}$$

5. Solve the system of equations
 $2x - 5y + 7z = 6$
 $x - 3y + 4z = 3$
 $3x - 8y + 11z = 11$, if consistent.

UNIT III

6. (a) If $x^y = e_{x-y}$, show that $\frac{dy}{dx} = \frac{\log x}{(1+\log x)^2}$
(b) Find $\frac{dx}{dy}$ if $y = x^{e^x}$
7. Find the maximum and minimum values of the function $8x^5 - 15x^4 + 10x^2$

UNIT IV

8. (a) Find the first three terms of $\frac{1}{(1+x)^2\sqrt{1+4x}}$ assuming the validity of the expansion in ascending powers of x .
(b) If $a^x = b^y = c^z$ and $b^2 = ac$ prove that $y = \frac{2xz}{x+z}$
9. Explain the properties of logarithms giving proofs.