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Total No. of Pages : 02

Total No. of Questions : 09

BBA (2012 & Onwards Batches)
BRDM(2014 & Onwards)
Bachelor In Service Industry Management (SIM) (2014 & Onwards)
(Sem.-2)

BUSINESS MATHEMATICS

Subject Code : BBA-203

Paper ID : [C0242]

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. **SECTION-A is COMPULSORY** consisting of TEN questions carrying TWO marks each.
2. **SECTION-B** consists of FOUR Sub-sections : Units-I, II, III & IV.
3. Each Sub-section contains TWO questions each, carrying TEN marks each.
4. Student have to attempt any ONE question from each Sub-section.

SECTION-A

1. Write briefly :

- (a) State Binomial Theorem for positive integral index.
- (b) Find a, b, c, d where
$$\begin{bmatrix} a+b & c+d \\ c-d & a-b \end{bmatrix} = \begin{bmatrix} 15 & -2 \\ -6 & 3 \end{bmatrix}.$$
- (c) Find the derivative of $x^n \cdot n^x$ of w.r.t. x .
- (d) Define symmetric and skew symmetric matrices giving one example of each.
- (e) Find $\frac{dy}{dx}$ if $y \log x = x \log y$.
- (f) Prove that $\log_a(mn) = \log_a m + \log_a n$.
- (g) If $A = \{1, 3, 5, 7\}$, $B = \{2, 5, 9, 10\}$. Find $A - B$ and $B - A$.
- (h) If $A = \begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}$, find $A^2 - 3A$.
- (i) Expand $(1 + 2x)^{-2}$ upto four terms where $|x| < \frac{1}{2}$.
- (j) If $A = \{1, 2, 3, 5\}$ $B = \{2, 5, 8, 9\}$ $C = \{2, 4, 6, 8\}$. Find $(A \cup B) \cap (A \cup C)$.

SECTION-B

UNIT-I

2. (a) Show that $7 \log_{10} \left(\frac{16}{15} \right) + 5 \log_{10} \left(\frac{25}{24} \right) + 3 \log_{10} \left(\frac{81}{80} \right) = \log_{10} 2$.
- (b) Using logarithms evaluate $(0.02374)^{1/4}$.
3. (a) If $A = \{1, 2, 3, 4, 5\}$, $B = \{3, 4, 5, 7, 9\}$ $U = \{1, 2, 3, 4, \dots, 10\}$ verify that $(A \cup B)^c = A^c \cap B^c$.
- (b) In a survey of 600 students in a school, 150 students were found to be taking tea and 225 taking coffee, 100 were taking both tea and coffee. Find how many students were taking neither tea nor coffee.

UNIT-II

4. Find the inverse of matrix $A = \begin{bmatrix} 1 & 3 & -7 \\ 5 & 0 & 6 \\ 9 & -2 & 7 \end{bmatrix}$.
5. Solve the following system of equations using Cramer's rule.
- $$\begin{aligned} x - 2y + 3z &= 4, \\ 2x + y - 3z &= 5, \\ -x + y + 2z &= 3, \end{aligned}$$

UNIT-III

6. (a) Differentiate $\frac{ax+b}{cx+d}$ w.r.t. x from first principle.
- (b) Differentiate $x^{\log x} + (\log x)^x$ w.r.t. x .
7. Find maximum and minimum values of the function $f(x) = x^3 - 6x^2 + 9x + 15$

UNIT-IV

8. The 3rd, 4th and 5th terms in the expansion of $(x + a)^n$ are respectively 84, 280 and 560. Find x , a , n .
9. (a) Find 4th term from the end in the expansion of $\left(\frac{4x}{5} - \frac{5}{2x} \right)^9$.
- (b) Using Binomial Theorem, find cube root of 999 upto four decimal places.