Roll No. **Total No. of Pages : 03**

Total No. of Questions : 09

BBA (Batch-2012) (Sem.–2nd)

BUSINESS MATHEMATICS

Subject Code : BBA-203

Paper ID : [C0242]

Time : 3 Hrs. **Max. Marks : 60**

INSTRUCTION TO CANDIDATES :

1. **SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.**
2. **SECTIONS-B consists of FOUR Subsections : Units-I, II, III & IV. Each Subsection contains TWO questions each carrying TEN marks each and student has to attempt any ONE question from each Subsection.**

SECTION-A

1. Write briefly :

(a) State Binomial theorem for positive integral index.

(b) If $x \begin{bmatrix} 2 \\ 3 \end{bmatrix} + y \begin{bmatrix} -1 \\ 1 \end{bmatrix} = \begin{bmatrix} 10 \\ 5 \end{bmatrix}$, find the values of x and y.

(c) Define comparable sets by giving examples.

(d) Find the derivative of $\frac{x}{3} + \frac{3}{x}, (x \neq 0)$ w.r.t. x.

(e) Define upper triangular and lower triangular matrices. Also give example in each case.

(f) Find $\frac{dy}{dx}$ if $x^3 + y^3 = 3axy$.

(g) Prove that $\log_b^a \times \log_a^b = 1$.

(h) List the sets A, B and C given that

$A \cup B = \{p, q, r, s\}$; $A \cup C = \{q, r, s, t\}$

$A \cap B = \{q, r\}$ and $A \cap C = \{q, s\}$

(i) If $A = \begin{bmatrix} 1 & 2 \\ 4 & 2 \end{bmatrix}$, then show that $|2A| = 4|A|$

(j) Expand $(2 + 3x)^{-4}$ upto four terms.

SECTION-B

UNIT - I

2. (a) Show that $\log 2 + 16 \log \frac{16}{15} + 12 \log \frac{25}{24} + 7 \log \frac{81}{80} = 1$.

(b) Solve the equation $11^{4x-5} \times 3^{2x} = 5^{3-x} \div 7^{-x}$. Using logarithms.

or

3. Prove that $A \cap (B \cup C) = (A \cap B) \cup (A \cap C)$. Also verify this relation for the sets.

$A = \{1, 2, 3, 5\}$, $B = \{2, 3, 4, 6\}$ and $C = \{1, 2, 4, 5, 7\}$.

UNIT - II

4. Find the inverse of the matrix

$$A = \begin{bmatrix} 8 & 4 & 2 \\ 2 & 9 & 4 \\ 1 & 2 & 8 \end{bmatrix}$$

or

5. Solve the following system of equations using Cramer's rule.

$5x - 7y + z = 11$, $6x - 8y - z = 15$, $3x + 2y - 6z = 7$.

UNIT - III

6. (a) Find the differential coefficient of $e^{\tan x}$ w.r.t. sin x.

   (b) If $y = (\sin x)^{\cos x}$, find $\frac{dy}{dx}$.

or

7. Find the maximum and minimum values of the function $\frac{x^3}{3} + x^2.a - 3xa^2$.

UNIT - IV

8. If the 2nd, 3rd and 4th terms in the expansion of $(x + a)^n$ are 240, 720 and 1080 respectively. Find x, a and n.

or

9. (a) Find the term independent of x in the expansion of $\left(\frac{3}{5}x^2 - \frac{1}{2x}\right)^9$.

   (b) Using Binomial theorem, find the value of $\sqrt[3]{126}$ to four decimal places.