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**B.B.A. 1st Semester
Examination, March-2021
(New Scheme 2014-17)**

BUSINESS MATHEMATICS

Paper-BBAN-102

Time : Three Hours]

[Maximum Marks : 80

Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.

Note :- Attempt compulsory question No. 1 from Section-A and *four* questions from Section-B (*one* question from each Unit). All questions carry equal marks.

Section-A

1. Explain and illustrate the following :

(a) Null Set

- (b) Cartesian product of two sets
- (c) Sum of first 10 natural numbers
- (d) \log_a^b
- (e) Permutation
- (f) Difference between a linear equation and quadratic equation
- (g) $\frac{dy}{dx}$
- (h) Scalar matrix

Section-B

Unit-I

2. (a) If A, B, C are three sets, prove that :
- $$A \cap (B \cup C) = (A \cap B) \cup (A \cap C)$$
- (b) Using Venn diagram, show that :
- $$A - (B \cup C) = (A - B) \cap (A - C)$$
3. Using suitable example, explain and illustrate :
- (i) Disjoint sets
 - (ii) Null set
 - (iii) Equality of two sets

- (iv) Finite set and
(v) Cartesian product of two sets

Unit-II

4. (a) Simplify :

$$\frac{1}{x^b + x^{-c} + 1} + \frac{1}{x^c + x^{-a} + 1} + \frac{1}{x^a + x^{-b} + 1}$$

given that $a + b + c = 0$.

- (b) Using log tables find the value of :

$$\sqrt{\frac{0.0074 \times 0.0137}{873.5}}$$

5. (a) Find the sum of all numbers between 300 and 500 which are divisible by 7.
(b) Sum of three numbers in AP is 30. If 1, 8 and 24 are added to the 1st, 2nd and 3rd numbers, respectively. The new numbers are in G.P. find the numbers.

Unit-III

6. (a) If ${}^n P_4 = 12 {}^n P_2$, find n .
(b) Find the number of combination of the word UNIVERSE by taking four letters at a time.

7. Solve the equation :

$$3x^2 - 18 + \sqrt{3x^2 - 4x - 6} = 4x$$

Unit-IV

8. Find the inverse of the matrix :

$$A = \begin{bmatrix} 2 & -3 & 4 \\ 5 & 6 & -2 \\ -4 & 2 & 1 \end{bmatrix}$$

and verify that $A.A^{-1} = I_3$.

9. (a) Differentiate $(4x^2 - 3x + 4)^2 (x^2 - 4)^2$
w.r.t. x .

(b) Evaluate :

$$\int (4x + 2) \sqrt{x^2 + x} + dx$$