

Roll No.

56503

**MBA 5 yr. 1st Sem. (N.S.)
Examination – February, 2022**

BUSINESS MATHEMATICS

Paper : 501P-3

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 : Question No. 1 is *compulsory*. Attempt remaining *four* questions, selecting *one* question from each unit. All questions carry equal marks.

1. Solve the following :

- Define infinite set with two examples.
- In how many ways 5 sportsmen be selected from a group of 10 ?
- Find 18th term of AP ; - 1, 5, 11, 17
- Solve for x : $\log_{27}x = 4/3$
- If $a^2 + b^2 = 7ab$, show that $2 \log (a + b) = 2 \log^3 + \log a + \log b$
- Integrate : $dx/(x+1)(x+2)^{1/2}$

- Differentiate $(x)^{\log x}$ with respect to x.
- Solve the following system of equation :
 $x + 5y = 7$ $3x + 15y = 21$

UNIT – I

- Prove that : $(A \text{ and } B)^1 = A^1 \cup B^1$
 - Prove that $A \cup (B \text{ and } C) = (A \cup B) \text{ and } (A \cup C)$
- A college awarded 38 medals in football, 15 in basketball and 20 in cricket. If these medals went to a total of 58 sportsmen and only 3 sportsmen got medals in all the three sports, how many sportsmen received medals in exactly two of the three sports ? <https://www.mdustudy.com>
 - If $(x/3 + 1, y - 2/3) = (5/3, 1/3)$ find the values of x and y.

UNIT – II

- Solve for x :
 - If $\log_2 x + \log_4 x + \log_{16} x = 21/4$.
 - $\log(10x + 5) - \log(x + 4) = \log 2$.
- Divide 20 into four parts which are in A.P. and such that the product of 1st and 4th is to product of the 2nd and 3rd in the ratio of 2 : 3.
 - If a, b, c are in A.P. prove that $a^3 + 4b^3 + c^3 = 3b(a^2 + c^2)$.

UNIT – III

6. How many different words can be formed from the letters of the word 'COMBINE' so that :
- (i) vowels always remain together ?
 - (ii) no two vowels are together ?
 - (iii) vowels may occupy odd places ?
7. The coefficients of three consecutive terms of $(1 + x)^{n+5}$ are in the ratio 5 : 10 : 14. Find the value of n ?

UNIT – IV

8. Prove that determinant of :

$$\begin{vmatrix} b+c & a & a \\ b & c+a & b \\ c & c & a+b \end{vmatrix} = 4abc$$

9. If $\log \left(x^2 + y^2 \right)^{1/2} = \tan^{-1}(y/x)$, show that $dy/dx = x + y/x - y$.