

Roll No.

E–1908

**Bachelor of Business Administration
(First Semester)**

EXAMINATION, Dec.-Jan., 2020-21

BUSINESS MATHEMATICS

(103)

Time : Three Hours]

[Maximum Marks : 90

[Minimum Pass Marks : 32

Note : Answer all *five* questions. Each question carries equal marks.

Unit—I

1. Find the inverse of matrix A :

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

Or

Find the value of the determinant :

$$\begin{vmatrix} 1+a & 1 & 1 \\ 1 & 1+b & 1 \\ 1 & 1 & 1+c \end{vmatrix}.$$

P. T. O.

Unit—II

2. Minimize :

$$z = 2x + 4y$$

such that :

$$6x + y \geq 18$$

$$x + 4y \geq 12$$

$$2x + y \geq 0$$

and $x, y \geq 0$.

Or

Define the following :

- (i) No solution
- (ii) Multiple solutions
- (iii) Mixed constraints
- (iv) Redundant constraints
- (v) Objective function

Unit—III

3. (a) If 1 is added to numerator a fraction become 1 and it becomes $\frac{1}{2}$ if 4 is added to denominator. What is the fraction ?

(b) If :

$$\frac{1}{a^3} + \frac{1}{b^3} + \frac{1}{c^3} = 0$$

prove that :

$$(a + b + c)^3 = 27abc$$

Or

Prove :

$$\frac{1}{6} \sqrt{\frac{3 \log 1728}{1 + \frac{1}{2} \log 0.36 + \frac{1}{3} \log 8}} = \frac{1}{2}$$

Unit—IV

4. (a) Out of four numbers the average of first three is 30 and of the last three is 32. If the last number is 38, find the first number.
- (b) The annual income of ABC taken together is ₹ 1,800. They spend 75%, 85% and 80% respectively of their incomes. If their annual savings are in the ratio of 20 : 9 : 8, find the annual saving of each.

Or

- (a) A sells a cow to B at a gain of 10% and B again sells it to C at a profit of 20%. If C pays ₹ 924 to B, find the purchase price of the cow for A.
- (b) Explain the concept of commission, brokerage and discount with example.

Unit—V

5. A man left ₹ 45,909 for his son and daughter who are 12 and 10 years old in such a way that if their shares be invested at 2% compound interest annually, they shall receive equal

amount on reaching 15 years of age. How did he divide money ?

Or

What do you understand by the concept of interest ? Explain the difference between simple interest and compound interest.