

1908000201020001
EXAMINATION FEBRUARY-MARCH 2024
BACHELOR OF COMMERCE
(HONORS) (FIRST SEMESTER)
BUSINESS MATHEMATICS & STATISTICS – I
LEVEL 2

[Time: As Per Schedule]

[Max. Marks: 50]

Instructions:

1. Fill up strictly the following details on your answer book

- a. Name of the Examination : **BACHELOR OF COMMERCE (HONORS)(FIRST SEMESTER)**
- b. Name of the Subject : **BUSINESS MATHEMATICS & STATISTICS – I LEVEL 2**
- c. Subject Code No : **1908000201020001**

2. Sketch neat and labelled diagram wherever necessary.
3. Figures to the right indicate full marks of the question.
4. All questions are compulsory.
5. Simple calculator can be used.
6. Usual notations are used.

Seat No:

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Student's Signature

Q.1 (a) Find $\lim_{x \rightarrow 0} \frac{1}{x} \left(\frac{3x+15}{2x+3} - 5 \right)$ **4**

(b) Find the derivative of $y = 1 + \frac{1}{1 + \frac{1}{x}}$ **4**

(c) Prove that $\lim_{x \rightarrow \infty} \sqrt{x}(\sqrt{x+3} - \sqrt{x}) = \frac{3}{2}$ **4**

Q.2 (a) Evaluate $\int \left(1 + \frac{1}{x+1} \right) \left(1 + \frac{1}{x+2} \right) \left(1 + \frac{1}{x+3} \right) dx$ **4**

(b) Find $\int \frac{(2x+1)(3-x)}{\sqrt{x}} dx$ **4**

(c) The marginal cost function is $200 - 20x + 0.2x^2$ and fixed cost is Rs. 800, **4**
find total cost function. Also find average cost function.

Q.3 (a) Find $A^2 + 5A + 2I$ from the following matrix. **4**

$$A = \begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix} \text{ and } I = \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$$

(b) If $A = \begin{bmatrix} 2 & 3 & 1 \\ 0 & 5 & 6 \\ 1 & 1 & 2 \end{bmatrix}$ then prove that $AA^{-1} = I$, where I is unit matrix. **4**

(c) If $A = \begin{bmatrix} 1 & 0 & 7 \\ 2 & 2 & 5 \\ 0 & 3 & 6 \end{bmatrix}$, show that $A(\text{Adj } A) = |A| * I$ **4**

Q.4 Answer Any Two of the following:

(1) If $A = \begin{bmatrix} x & -5 & a \\ b & y & 8 \\ 3 & c & z \end{bmatrix}$ then **7**

- (i) Find a, b, c if A is a symmetric matrix
- (ii) Find x, y, z, a, b, c , if A is a skew symmetric matrix.

(2) Using inverse matrix solve the following equation. **7**

$$\begin{aligned} x + y + z &= 3 \\ 2x - y - z &= 3 \\ x - y + z &= 9 \end{aligned}$$

(3) A factory produces two items A and B. These items are produced on two machines M_1 and M_2 . For producing each unit A, 2 hours of machine M_1 and 5 hours of machine M_2 are used and for producing each unit of B, 3 hours of machine M_1 and 2 hours of machine M_2 are used. The total hours available per week on machine M_1 is 50 hours and on machine M_2 is 70 hours. Find how many units of A and B should be produced using matrix method. **7**
