

JK LAKSHMIPAT UNIVERSITY, JAIPUR
INSTITUTE OF MANAGEMENT

End Term, December 2025
BBA, Semester I, 2025-26

ID1104: Business Mathematics

Time: 2 hours, Max. Marks: 30

Roll No.: Name:

Instructions to students:

1. Read the entire question paper before beginning.
2. Write your **Roll No.** and **Name** clearly on the question paper before starting.
3. **Any type of calculator** is allowed; but no other digital devices are permitted.
4. Clearly indicate the question number you have chosen.
5. *Note:* Irrelevant or redundant answers will be penalized.

1. (5 marks) The numbers of three types of bank accounts on April 1 at the State Bank of India (SBI) and two of its branches are represented by matrix A :

	Savings	Current	Fixed Deposits
Head Office	5200	3100	1800
Mumbai Branch	2400	1300	900
Pune Branch	3100	1600	700

The number and types of accounts opened during the first quarter (April–June) are represented by matrix B , and the number of accounts closed during the same period are represented by matrix C :

$$B = \begin{bmatrix} 420 & 260 & 140 \\ 300 & 180 & 120 \\ 350 & 200 & 100 \end{bmatrix} \quad \text{and} \quad C = \begin{bmatrix} 150 & 90 & 60 \\ 120 & 70 & 40 \\ 100 & 60 & 30 \end{bmatrix}$$

- (a) (3 marks) Find matrix D , which represents the number of each type of account at the end of the first quarter at each location. (CO 1)
- (b) (3 marks) The government has announced a new digital-banking initiative, and it is anticipated that there will be a **12% increase** in the number of accounts at each location during the second quarter (July–September). What will be final number of each type of account at each branch? (CO 2, 3, 4)
2. (7 marks) Shreya regularly makes long-distance phone calls to three foreign cities—London, Tokyo, and Hong Kong. The matrices A and B give the lengths (in minutes) of her calls during peak and nonpeak hours, respectively, to each of these three cities during the month of June.

$$A = \begin{bmatrix} \text{London} & \text{Tokyo} & \text{Hong Kong} \\ 60 & 70 & 30 \end{bmatrix}$$

and

$$B = \begin{bmatrix} \text{London} & \text{Tokyo} & \text{Hong Kong} \\ 200 & 350 & 100 \end{bmatrix}$$

The costs for the calls (in dollars per minute) for the peak and nonpeak periods in the month in question are given, respectively, by the matrices

$$C = \begin{matrix} & \begin{matrix} \text{London} \\ \text{Tokyo} \\ \text{Hong Kong} \end{matrix} \end{matrix} \begin{bmatrix} .3 \\ .4 \\ .5 \end{bmatrix} \quad \text{and} \quad D = \begin{matrix} & \begin{matrix} \text{London} \\ \text{Tokyo} \\ \text{Hong Kong} \end{matrix} \end{matrix} \begin{bmatrix} .6 \\ .4 \\ .2 \end{bmatrix}$$

Compute the matrix $AC + BD$ and explain what it represents. (CO 2, 3)

3. (4 marks) Solve for u , x , y , and z in the matrix equation below. (CO 1)

$$\begin{bmatrix} 1 & 2 \\ 6 & 5 \\ x & 13 \end{bmatrix} - 3 \begin{bmatrix} y-1 & 2 \\ 2 & 1 \\ 3 & 2z+1 \end{bmatrix} = 2 \begin{bmatrix} -3 & -2u \\ 0 & 1 \\ 3 & 1 \end{bmatrix}$$

4. (7 marks) You are trying to buy a digital watch from an online platform. The price is ₹15,000. If the interest rate is 12% per annum, what will the 3-month EMI come out to be? What is the total interest amount you paid? (CO 2, 4)

5. (7 marks) Mr. Sharma opens a recurring deposit account with a bank and deposits ₹10,000 at the beginning of every quarter for 2 years. The bank pays interest at the rate of 12% per annum, compounded quarterly.

(a) (1 mark) Calculate the total amount deposited by Mr. Sharma over the 2 years. (CO 1)

(b) (3 marks) Calculate the maturity value of the recurring deposit account. (CO 2)

(c) (3 marks) How much interest did Mr. Sharma earn on his deposits? (CO 4)
