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Course Code: MAT102 **Course Title: Mathematics II** **Section: 47_E** **Date : 27/09/26**

Class Test No.: 01 **Signature of the Course Teacher: SST**

03/10/2026 09:54

Q1: Answer the following questions:

a) Define Lower Triangular Matrix, Involuntary Matrix and Sparse Matrix with example. 03

b) "All inverse matrixes are singular square matrix"- verify it. 01

c) Write down the condition for matrix addition and matrix multiplication. 01

Q2: Test the orthogonally of the following matrix, $B = \begin{bmatrix} \frac{1}{3} & \frac{2}{3} & -\frac{2}{3} \\ \frac{2}{3} & \frac{1}{3} & \frac{2}{3} \\ \frac{2}{3} & -\frac{2}{3} & -\frac{1}{3} \end{bmatrix}$ 03

Q3: Prove that $A = \begin{bmatrix} 1 & -1 & 1 \\ 1 & 2 & -3 \\ 1 & 4 & 9 \end{bmatrix}$ is invertible matrix. 04

Q4: Given that, $C = \begin{bmatrix} 2 & 3 & 1 \\ 0 & 1 & 5 \end{bmatrix}$ & $D = \begin{bmatrix} 1 & 2 & -6 \\ 0 & -1 & 3 \end{bmatrix}$. Find $3C - 4D = ?$ 03

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