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Vellore Institute of Technology
(Deemed to be University under section 3 of UGC Act, 1956)

Fall Sem. 2024-25

Tutorial – 1

Programme Name & Branch: PG Freshers

Course Name & Code: Applied Linear Algebra (PMDS501L)

Practice all the questions.

1. Solve the following system of linear equations using Cramer's rule:

   $2x + 3y - z = 7; \quad 4x + y + 5z = 10; \quad -2x + 3y + 2z = -1.$

2. Reduce the following system of linear equations to row-echelon form using the Gauss-Jordan Elimination method and then solve for x, y, and z:

   $x + 2y + 3z = 9; \;\; 2x + 3y + 4z = 13; \;\; 3x + 4y + 5z = 17$

3. Given the following matrix, perform a partial pivoting step and reduce it to Row Canonical form:

   $$\begin{bmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \\ 7 & 8 & 9 \end{bmatrix}$$

4. Given the matrix A = $\begin{bmatrix} 3 & 1 \\ 4 & 2 \end{bmatrix}$, find the elementary matrices that can be used to transform A into the identity matrix.

5. Transform the following matrix into it's diagonal form: $A = \begin{bmatrix} 6 & -2 \\ 2 & 3 \end{bmatrix}$