



United International University
School of Science and Engineering

Final Assignment Trimester: Summer -2020

Course Title: Linear Algebra, Ordinary & Partial Differential Equations

Course Code: Math 183

Time: 1 hour 15 minutes

There are four (04) questions. Answer any one from 3 and 4, whereas 1 and 2 is mandatory.

1. a) Solve the following system by Gauss-Jordan elimination [6]

$$\begin{aligned}x + 2y &= -1 \\ 3x + 4y + z &= 2 \\ -2x + 3y + 2z &= 5\end{aligned}$$

- (b) Solve the following system by Cramer's rule [4]

$$\begin{aligned}x + y + z &= 45 \\ -x + z &= 8 \\ x - 2y + z &= 0\end{aligned}$$

2.

- a) Find the inverse of $A = \begin{bmatrix} 2 & 12 & 8 \\ 2 & 4 & -1 \\ -1 & 2 & 5 \end{bmatrix}$ by applying inversion algorithm. [4]

- b) Find i) B^{-1} ii) $\text{Det}(A^T)$ iii) cofactor C_{12} of A , where

$$A = \begin{bmatrix} 3 & 1 & 2 \\ 2 & 0 & -2 \\ 0 & 1 & 1 \end{bmatrix} \text{ and } B = \begin{bmatrix} 2 & 2 \\ -3 & -5 \end{bmatrix} \quad [6]$$

3. Determine whether the given differential equation is exact or not also solve the differential equation

$$(e^y + 1)\cos x \, dx + e^y \sin x \, dy = 0 \quad [5]$$

4. Determine whether the given differential equation is exact or not also solve the differential equation

$$e^y \sin x \, dx - (e^y + 2)\cos x \, dy = 0 \quad [5]$$