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]**

$$x + 2y = -1$$
$$3x + 4y + z = 2$$
$$-2x + 3y + 2z = 5$$

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

$$x + y + z = 45$$
$$-x + z = 8$$
$$x - 2y + z = 0$$

2.

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

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

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

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

$$(e^y + 1)cosx\ dx + e^y sinx\ dy = 0$$ **[5]**

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

$$e^y sinx\ dx - (e^y + 2)cosx\ dy = 0$$ **[5]**