Assignment No. – 02

Topic – Dual Simplex Method, Big M Method

Date of Submission – 04/04/2025

Instructions:

1. **Write the assignment on two sided ruled sheets.**
2. **For every problem, follow the same approach as done during the lecture.**
3. **Complete simplex table is expected on a whole page.**

Questions:

1. Use Big M (Penalty) method to solve L.P.P.

   a. Maximize $z = 3x_1 + 2x_2$
   Subject to,
   $$2x_1 + x_2 \leq 2$$
   $$3x_1 + 4x_2 \geq 12$$
   $$x_1, x_2 \geq 0$$

   b. Maximize $z = 2x_1 + x_2 + 3x_3$
   Subject to,
   $$x_1 + x_2 + 2x_3 \leq 5$$
   $$2x_1 + 3x_2 + 4x_3 = 12$$
   $$x_1, x_2, x_3 \geq 0$$

2. Write the Dual of following & solve:

   a. Maximize $z = 8x_1 + 6x_2$
   Subject to,
   $$x_1 - x_2 \leq 0.6$$
   $$x_1 - x_2 \geq 2$$
   $$x_1, x_2 \geq 0$$

b. Maximize $z = 3x_1 + 4x_2$
Subject to,

$$x_1 - x_2 \leq 1$$
$$x_1 + x_2 \geq 4$$
$$x_1 - 3x_2 \leq 3$$
$$x_1, x_2 \geq 0$$

3. Solve by Dual Simplex Method:

a. Minimize $z = x_1 + x_2$
Subject to,

$$-2x_1 - x_2 \leq -2$$
$$x_1 + x_2 \leq -1$$
$$x_1, x_2 \geq 0$$

b. Minimize $z = 3x_1 + x_2$
Subject to,

$$x_1 + x_2 \geq 1$$
$$2x_1 + 3x_2 \geq 2$$
$$x_1, x_2 \geq 0$$