

Assignment 5 – MAT 3210 (Linear Programming) on 3.3 and 3.4

No need to hand in

1. Use M -method to solve the following LPP:

$$\text{minimize} \quad z = 4x_1 + x_2$$

$$\text{subject to} \quad 3x_1 + x_2 = 3$$

$$4x_1 + 3x_2 \geq 6$$

$$x_1 + 2x_2 \leq 4$$

$$x_1, x_2 \geq 0$$

2. Use M -method to solve the following LPP:

$$\text{(a) maximize} \quad z = 2x_1 + 3x_2 - 5x_3$$

$$\text{(b) minimize} \quad z = 4x_1 - 8x_2 + 3x_3$$

$$\text{subject to} \quad x_1 + x_2 + x_3 = 7$$

$$2x_1 - 5x_2 + x_3 \geq 10$$

$$x_1, x_2, x_3 \geq 0$$

3. Use Two-Phase method to solve the following LPP:

$$\text{minimize} \quad z = 4x_1 + x_2$$

$$\begin{aligned}
\text{subject to} \quad & 3x_1 + x_2 = 3 \\
& 4x_1 + 3x_2 \geq 6 \\
& x_1 + 2x_2 \leq 4 \\
& x_1, x_2 \geq 0
\end{aligned}$$

4. Use Two-Phase method to solve the following LPP:

$$(a) \text{ maximize } \quad z = 2x_1 + 3x_2 - 5x_3$$

$$(b) \text{ minimize } \quad z = 4x_1 - 8x_2 + 3x_3$$

$$\begin{aligned}
\text{subject to} \quad & x_1 + x_2 + x_3 = 7 \\
& 2x_1 - 5x_2 + x_3 \geq 10 \\
& x_1, x_2, x_3 \geq 0
\end{aligned}$$

5. Solve the following LPP by Two-Phase method and M-method.

$$\text{Maximize } \quad x_0 = 4x_1 + 5x_2 - 3x_3$$

$$\text{Subject to } \quad x_1 + x_2 + x_3 = 10$$

$$x_1 - x_2 \geq 1$$

$$2x_1 + 3x_2 + x_3 \leq 20$$

$$x_1, x_2, x_3 \geq 0$$

6. Solve the following LPP by Two-Phase method.

$$\text{Minimize } \quad x_0 = -x_4 - x_1 - x_2$$

$$\text{Subject to } \quad 2x_1 + 2x_2 + x_4 = 7$$

$$4x_1 + 3x_2 - x_3 + x_4 = 11$$

$$3x_1 + 3x_2 + x_4 = 13$$

$$x_1, x_2, x_3 \geq 0, x_4 \text{ is free}$$