**Dated: 24th February 2022**
**Due Date: 3rd March 2022 (In class)**
**Home Work # 1**

**NOTE: Please use graph paper attached for solving the problem(s).**

**GRAPHICAL SOLUTION (30 points)**

1. Consider the LP of the Reddy Mikks Formulation:

Maximize $z = 3x_1 + 2x_2$

Subject to

$$x_1 + 2x_2 \leq 6$$
$$2x_1 + x_2 \leq 8$$
$$-x_1 + x_2 \leq 1$$
$$x_2 \leq 2$$
$$x_1, x_2 \geq 0$$

We already solved this in class.

Add the following new constraint to the Reddy Mikks Problem, and change the objective **function to minimization**. Solve it using Graphical Solution Method (using the objective function lines). (10 points)

$$x_1 + x_2 \geq 1$$

**FORMULATION (20 points)**

2. The Windsor Glass Company is planning to launch two new products. Product 1 is an 8-foot glass door with aluminum framing and Product 2 a 4x6 foot double-hung wood-framed window.
   - Aluminum frames are made in Plant 1, wood frames are made in Plant 2, and Plant 3 produces the glass and assembles the products.
   - Product 1 requires some of the production capacity in Plants 1 and 3, but none in Plant 2.
   - Product 2 needs only Plants 2 and 3. The marketing division has concluded that the company could sell as much of either product as could be processed by these plants. The management of the company wants to determine what mixture of both products would be the most profitable.

   The following table provides the information available.

| Plant | Production time per batch, hours | | Production time available per week, hours |
|---|---|---|---|
| | Product | | |
| | 1 | 2 | |
| 1 | 1 | 0 | 4 |
| 2 | 0 | 2 | 12 |
| 3 | 3 | 2 | 18 |
| Profit per batch | $3,000 | $5,000 | |

a) Formulate the problem as LP. (10 points)
b) and solve it using Graphical Solution (using the objective function lines). (10 points)