c. Using Simplex Method

Minimize $z = 10x_1 + 15x_2$

Subject to

$$x_1 + 3x_2 \geq 16$$
$$3x_1 + 5x_2 \leq 82$$
$$2x_1 + x_2 = 30$$
$$x_1, x_2 \geq 0$$

3. Attempt *any two* of the following: 7 x 2

a. Rice and wheat are grown on a land of 300 ha. The cost of raising crop 1 is 3 unit/ha, while for crop 2 it is 1 unit/ha. The benefit from crop 1 is 5 unit/ha and from crop 2, it is 2 unit/ha. A total of 300 units of money is available for raising both crops. What should be the cropping plan (how much area for crop 1 and how much for crop 2) in order to maximize the total net benefits? (Use Simplex Method)

b. Transform to *dual and solve the following* problem:

Maximize $z = 3x_1 + 5x_2$

Subject to $x_1 \leq 4$

$$2x_2 \leq 12$$
$$3x_1 + 2x_2 \leq 18$$
$$x_1 \geq 0; \quad x_2 \geq 0$$

c. Explain working principle of standard operating policy.

4. Attempt *any two* of the following: 7 x 2

a. Inflows during four seasons to a reservoir with storage capacity of 4 units are, 3, 1, 2 and 2 units respectively. Only discrete values, 0, 1, 2... are considered for storage and release. Overflows from the reservoir are also included in the release. Reservoir storage at the beginning of the year is 0 units. Release from the reservoir during a season results in the following benefits which are same for all the four seasons.

Release	Benefit	Release	Benefit
0	-120	4	640
1	290	5	640
2	340	6	530
3	590	7	210

Obtain the release policy using backward recursive equation, starting with the last stage.