

14 Operations Research

**1.8.4. Objective of the Problem**

To optimize the profit for a given level of cost, it can be reworded as: "What is the maximum value of the profit or minimization of the cost in the objective of the problem. For this, the statement is given that the profit contribution of 1 is Rs. 20 per unit and that of product 2 is Rs. 10 per unit.

**1.8.5. To establish relationship between variables and constraints and build up a model**

Let us use the company manufactures a unit of  $x_1$  and  $x_2$  units of  $x_2$ . Then we can set up a constraint and form an objective function. Let us assume that resources are given in machine 1 and machine 2. The total available hours of machine 1 are 400 hours and of machine 2 are 1200 hours. The total available material is 1000 units. Then, the mathematical relationship in the form of mathematical model is as follows:

**Maximize**  $Z = 20x_1 + 10x_2$  (Objective function)

**Subject to**  $2x_1 + 3x_2 \leq 400$  (Machine 1 constraint)

$3x_1 + 5x_2 \leq 1200$  (Machine 2 constraint)

$x_1, x_2 \geq 0$  (Non-negativity constraint)

**1.8.6. Identify the possible alternative solutions for known as Basic Feasible Solution or Simple BFS**

There are various methods of getting solutions. They include both the graphical and algebraic methods. The graphical method is used when the number of variables is less than or equal to 2. The algebraic method is used when the number of variables is more than 2. The graphical method is used when the number of variables is less than or equal to 2. The algebraic method is used when the number of variables is more than 2. The graphical method is used when the number of variables is less than or equal to 2. The algebraic method is used when the number of variables is more than 2.

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