

**SELF ASSESSMENT TEST -11****CLASS 10+2**

## LINEAR PROGRAMMING

1. Maximize  $z = 3x + 2y$  subject to constraints  $x + 2y \leq 10, 3x + y \leq 15$   
 $x \geq 0, y \geq 0$ .
2. Maximize  $z = 4x + 8y$  subject to constraints  $2x + y \leq 30, x + 2y \leq 24,$   
 $x \geq 3, y \leq 9, y \geq 0$ .
3. Minimize  $z = 3x + 5y$  subject to constraints  $x + 3y \geq 3, x + y \geq 2, x \geq 0, y \geq 0$ .
4. Maximize and Minimize  $z = 3x + 9y$  subject to constraints  $x + 3y \leq 60,$   
 $x + y \geq 10, x \leq y, x \geq 0, y \geq 0$
5. Maximize  $z = -x + 2y$  subject to constraints  $-x + 3y \leq 10, x + y \leq 6, x - y \leq 2,$   
 $x \geq 0, y \geq 0$ .
6. A diet is to contain at least 80 units of vitamin A and 100 units of minerals. Two foods  $F_1$  and  $F_2$  are available. Food  $F_1$  costs Rs. 4 per unit food and  $F_2$  costs Rs. 6 per unit. One unit of food  $F_1$  contains 3 units of vitamin A and 4 units of minerals. One unit of food  $F_2$  contains 6 units of vitamin A and 3 units of minerals. Find the minimum cost for diet that consists of mixture of these two foods and also meets the minimal requirements.
7. A man manufactures two types of steel trunks. He has two machines A & B. For completing the first type of the trunk, it requires 3 hours on the machine A and 1 hour on machine B, whereas the second type of the trunk requires 3 hours on machine A & 2 hours on machine B. Machine A can work for 18 hours & B for 8 hours only per day. There is

a profit of Rs.30 on the first type of the trunk and Rs.48 on the second type of the trunk. How many trunks of each type should be manufactured every day to earn maximum profit ?

8. There are two factories located one at place P and the place Q. From these locations, a certain commodity is to be delivered to each of three depots situated at A, B & C. The weekly requirement of the depots are resp. 5, 5 & 4 units of the commodity while the production capacity of the factories at P & Q are resp. 8 & 6 units. The cost of transportation per unit is given below;

From/to	Cost of (in Rs.)		
	A	B	C
P	160	100	150
Q	100	120	100

How many units should be transported from each factory to each depots in order that the transportable cost is minimum transportation cost ?