Q. A producer has 30 and 17 unit of labour and capital respectively which he can use to produce two types of goods X and Y . to produce one unit of X, 2 units of labour and 3 units of capital are required. Similarly 3 unit of labour and 1 unit of capital are required to produce one unit of Y . If X and Y are priced at Rs 100 and 120 per unit respectively, how should the producer use his resources to maximise the total revenue? Formulate the linear programming problem.

Solution : Let

Number of goods of type X = x1

Number of goods of type Y = x2

Z = total revenue

There fore Z (max) = 100x1 + 120x2

Now we represent the data by following table:

|  |  |  |  |
| --- | --- | --- | --- |
|  | Goods type X | Goods type Y | Available resources |
| Labour | 3 | 3 | 30 |
| Capital | 2 | 1 | 17 |
| Price | 100 | 120 |  |

Thus we have

2x1+3x2≤30 (because 30 unit of labour are availa

3x1+1x2≤17 (because 17 unit of capital are available)

Also number of goods can not be negative

So, x1≥0 , x2 ≥0

Therefore the required LPP is

Max. Z =100x1 + 120x2 subject to the constraints,

2x1+3x2≤30

3x1+1x2≤17

x1≥0 , x2 ≥0