19/07/21

$x_1 + x_2 = 1000$

$x_1 = 300$

$x_2 = 150$

$x_1 = 0$, $x_2 = 1000$ A (0, 1000)

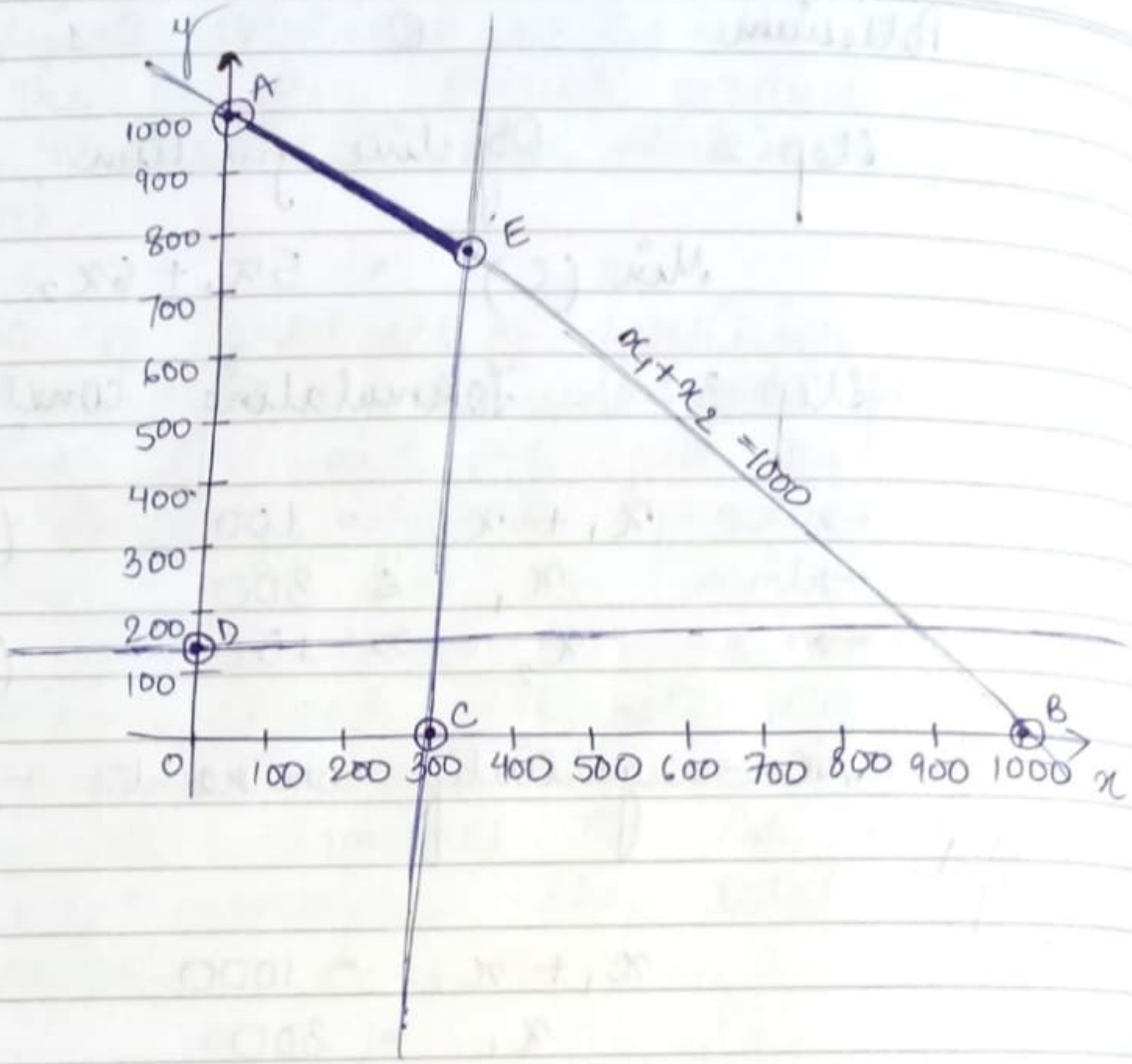
$x_2 = 0$, $x_1 = 1000$ B (1000, 0)

$x_1 = 300$

$x_2 = 150$

When only x_1 is there, it'll be a line parallel to y axis.

When there is only x_2, it'll be a line parallel to x axis.



Coordinates of point E :

$$x_1 + x_2 = 1000 \quad \text{—— (1)}$$

$$x_1 = 300 \quad \text{—— (2)}$$

Putting (2) in (1),

$$300 + x_2 = 1000$$

$$\Rightarrow x_2 = 700.$$

Here, feasible region is straight line AE.

Finding optimal solution,

$A\ (0, 1000) = 5x_1 + 6x_2$
$= 5 \times 0 + 6 \times 1000$
$= ₹\ 6000$

$E\ (300, 700) = 5 \times 300 + 6 \times 700$
$= 1500 + 4200$
$= ₹\ 5700$ ✓

⇒ Rules for formulation :

1) If in ques., the terms like exactly or equal to or identical to are used, then '=' sign will be used.
2) If in ques. terms like available, at the most, less than or equal to are used, then '≤' sign will be used.
3) If in ques., terms like atleast, greater than equal to are used, then '≥' sign will be used.

- Special cases of Linear Programming in Graphical Method →

1. Infeasibility - When there is no feasible solution possible because of conflicting nature of the constraints. Hence, no solution.

2. Unboundedness - This is applicable only in maximisation problems when

the feasible region is open and unbounded. Hence, no solution.

3. Redundancy

4. More than 1 Optimal solution : When ~~there~~ there is a tie in corner point evaluation. Hence, more than 1 solution.

Assignment

Q. Formulate and graphically solve one problem each of maximisation and minimisation type.