1.A dietician wishes to mix two types of foods in such a way that vitamin contents of the mixture contain at least 8 units of vitamin A and 10 units of vitamin C. Food 'I' contains 2 units/kg of vitamin A and 1 unit/kg of vitamin C. Food 'II' contains 1 unit/kg of vitamin A and 2 units/kg of vitamin C. It costs Rs 50 per kg to purchase Food 'I' and Rs 70 per kg to purchase Food 'II'. Formulate this problem as a linear programming problem to minimise the cost of such a mixture.

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Let mixture contains x kg of food I
       and y kg of food II

Vitamins	Food		Quantity
	I	II	
Vit A	2	1	≥ 8 units
Vit C	1	2	≥ 10 units
Cost	50	70	

According to Question

vitamin A   Food I Contains → 2 units
              Food II contains → 1 units
                 Quantity → atleast 8 units
                 $\therefore 2x + y \geq 8$ ——(1)

vitamin C   Food I Contains → 1 unit
              Food II contains → 2 units
                 Quantity → atleast 10 units
                 $x + 2y \geq 10$ ——(2)

Also $x, y \geq 0$

we will use function minimize z

    cost of food I per kg = 50/-
    cost of food II per kg = 70/-

          $\therefore z = 50x + 70y$

Subject of Constraints
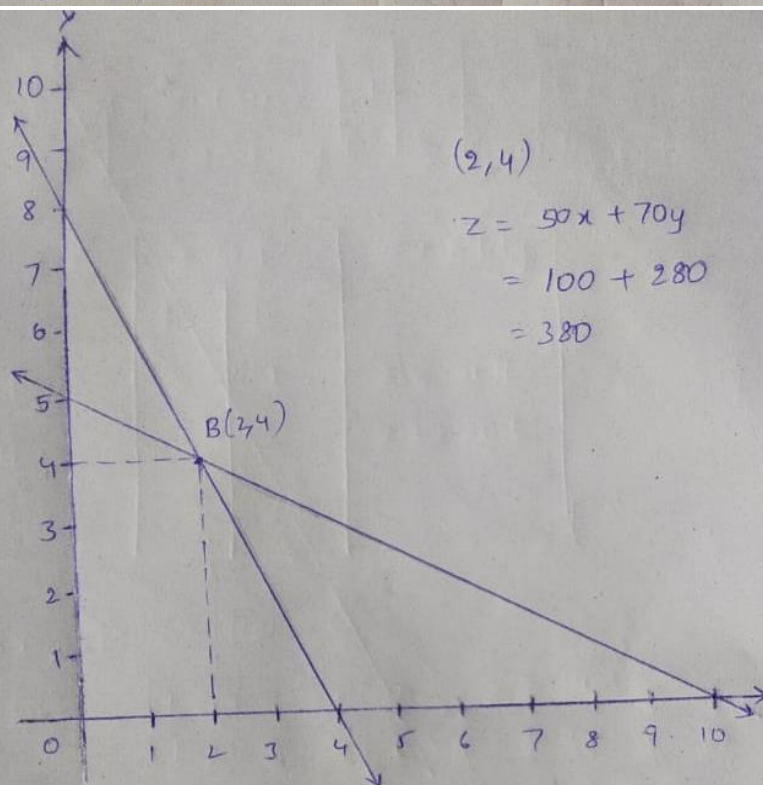
$$2x + y \geq 8$$

$$x + 2y \geq 10$$

$$x, y \geq 0$$

$2x + y \geq 8$

x	0	4
y	8	0

$x + 2y \geq 10$

x	0	10
y	5	0

$(2, 4)$

$z = 50x + 70y$

$= 100 + 280$

$= 380$

B(2,4)

$\therefore 380$ is minimum value of z

Hence the optimal strategy to mix b

2 kg of Food I

4 kg of Food II

So, minimum cost = ₹ 380