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(Q 2.) ABC Co. produces a fertiliser mixing 2 chemicals i.e sodium and potassium costing ₹5 and ₹6 per kg respectively. The company should produce exactly 1000 kg of mixture in such a way that at the most 300 kg of sodium and atleast 150 kgs of potassium should be used. Find the quantity of 2 chemicals to be used in order to minimise the total cost of production.

Ans. Objective function →

$$\text{Min } (C) = 5x_1 + 6x_2$$

Step 1: Making a preliminary table.

Ingredients / Item →	Sodium	Potassium	Total
Cost (₹/kg)	5	6	
Proportion	1	1	1000
Sodium	1	0	300

* Profit maximization problems are generally optimal product mix problems.

Potassium	0	1	150

Step 2 : Objective function,

$$\text{Min } (C) = 5x_1 + 6x_2$$

Step 3: Formulating constraints,

→ $x_1 + x_2 = 1000$ (mixture)

→ $x_1 \leq 300$ (sodium)

→ $x_2 \geq 150$ (potassium)

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