Let the daily diet be consist of x_1 gallons of milk, x_2 pounds of beef and x_3 dozens of eggs.

∴ Total cost per day is Rs

$$\text{Min } z = x_1 + 1.1\, x_2 + 0.5\, x_3$$

Total amount of vitamin A in daily diet is

$$x_1 + x_2 + 10\, x_3 \geq 1$$

Similarly, Total amount of vitamin B, and C in daily diet is

$$100\, x_1 + 10\, x_2 + 10\, x_3 \geq 50$$

$$10\, x_1 + 100\, x_2 + 10\, x_3 \geq 10$$

Hence the linear programming formulation of this diet problem is

$$\text{Min } z = x_1 + 1.1\, x_2 + 0.5\, x_3$$

Subject to Constant

$$x_1 + x_2 + 10\, x_3 \geq 1$$
$$100\, x_1 + 10\, x_2 + 10\, x_3 \geq 50$$
$$10\, x_1 + 100\, x_2 + 10\, x_3 \geq 10$$

$$x_1, x_2, x_3 \geq 0$$

Ques A resourceful home decorator manufacturer to types of lamps say A and B. Both lamps go through two technicians first A cutter and second A finisher. Lamp A required two hours of cutter time and one hour of the finisher time. Lamp B required one hour of cutter time and two hours of finisher time. The cutter has 104 hours and finisher 76 hour available time each month. Profit on 1 lamp A is Rs 6 and on B lamp is Rs 11. Assuming that he can sale of that he produces how many of each type of lamps should be manufacturer to obtained the best return?

Lamp	Cutter	finisher	Availability
A	2	1	104
B	1	2	76
Profit	6	11	

Let the decorator manufacturer x_1 and x_2 lamps of type A and B respectively.

Hence the mathematical formulation of the given problem is

$$\text{Max } z = 6x_1 + 11x_2$$

Subject to constant

$$2x_1 + x_2 \leq 104$$
$$x_1 + 2x_2 \leq 76$$

$$x_1, x_2 \geq 0$$

Ques A manufacturer of a line of patient medicine is preparing a production plan on medicine A and B. There are sufficient ingredients available to make 20 thousands bottles of A and 40 thousands bottles of B but there are only 45 thousands bottles into which either of the medicine can be put. Furthermore it takes three hours to prepare enough material to fill 1000 bottles of A, it takes 1 hour to prepare enough material to fill 1000 bottles of B and there are 66 hours available for this operation. The profit is Rs 8 per bottle of A and Rs 7 per bottle of B. Formulate this problem as a linear programming problem ?

Let the manufacturer product x_1 and x_2 bottles of medicines A & B respectively.

Hence the mathematical formulation of the given problem is

$$\text{Max } z = 8x_1 + 7x_2$$

Subject to constant,

$$3x_1 + x_2 \leq 66000$$
$$x_1 + x_2 \leq 45000$$
$$x_1 \leq 20000$$
$$x_2 \leq 40000 \qquad x_1, x_2 \geq 0$$

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