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**MM 30**

**Linear Programming**  
Section A 4 Marks Each

**Time 1 Hour**

**Paper prepared by**

**Dev Anoop**

**Mathematics Teacher**

**Bathinda**

**Email: [devanoop@devanoop.com](mailto:devanoop@devanoop.com)**

- Graphically, solve the system of inequations  $x - y \leq 2$ ,  $x + y \leq 4$ ,  $x \geq 0$ ,  $y \geq 0$ .
- A produce has 20 and 10 units of labour and capital respectively which he can use to produce two kinds of goods x and y. To produce one unit of goods x, two units of capital and one unit of labour is required. To produce one unit of goods y, three units of labour and one unit of capital is required. If x and y are priced at Rs 80 and Rs 100 per unit respectively, how should the producer use the resources to maximise the total revenue. Solve the problem graphically.
- Minimize  $Z = x + 4y$ , subject to  $x + y \geq 2000$ ,  $\frac{x}{4} + \frac{3y}{4} \geq 1000$ ,  $\frac{x}{20} + \frac{y}{10} \leq 175$ ,  $x, y > 0$

**Section A 6 Marks Each**

- A factory owner wants to purchase 2 types of machines A and B for his factory. The machine A requires an area of  $1000 \text{ m}^2$  and 12 skilled men for running it and its daily output is 50 units whereas machine B requires an area of  $1200 \text{ m}^2$  and 8 skilled men for running it and its daily output is 40 units. If an area of  $7600 \text{ m}^2$  and 72 skilled men be available to operate the machines, how many machines of each type should be bought to maximise the daily output?
- A dealer wishes to purchase a number of fans, and sewing machines. He has only Rs 5760 to invest and has space at most 20 items, a fan costs him Rs 360 and sewing machine Rs 240. He expects to sell a fan at a profit of Rs 22 and sewing machine at a profit of Rs 18. Assuming that he can sell all the items that he buys. How should he invest his money to maximise the profit. Solve graphically.
- P and Q two places for the factories with output 8 and 6 units, while a, b, c are places for depots with requirement 5, 5 and 4 units respectively. The cost of transportation per unit is as under

From/ To	A	B	C
P	Rs 16	Rs 10	Rs 15
Q	Rs 10	Rs 12	Rs 10

How many units should be transported from each factory to each depot to minimise the cost. Formulate L.P.P. and solve it.