

QUESTION BANK

MCA - III SEM.

301

(A) Questions of 1.5 Marks

- (1) What is operation research? Explain its features
- (2) Explain the four techniques of operation research
- (3) Explain the role of operation research in management.
- (4) Explain the various limitations of operation research.

(B) Questions of 2 Marks

- (1) What is linear programming problem? What are the assumptions in formulating linear programming problem?
- (2) Vitamins A & B are available in two different foods P & Q. One unit of P contains 2 units of vitamin A and 3 units of vitamin B. One unit of Q contains 5 units of vitamin A and 4 units of Vitamin B. The minimum daily consumption of vitamin A and B should be 1000 and 1500 units respectively. One unit of P costs Rs 5 and one unit of Q costs Rs. 6. What should be the intake of P & Q in order to minimize cost.
- (3) Woods Product Ltd currently produces two major products, tables and chairs. When sold, each chair yields a profit of 35 and table Rs 45. An analysis of the production work sheets reveals the following manufacturing data :

Product	main Hrs. Per Unit	Machine Per Unit
Chair	5	0.8
Table	8	1.2

Time available during the year 800 man Hours 485 machine Hrs.

The company has a minimum demand for 50 chairs and a minimum demand for 25 tables during year 2003. Construct an appropriate linear programme for maximising the profit of Woods Product Ltd.

(C) 3 Marks questions :

Q.1 Solve the following linear programming problem by graphically.

$$\begin{aligned} \max Z &= 5x_1 + 3x_2 \\ \text{subjects} &2x_1 + x_2 < 1000 \\ &x_1 < 400 \\ &x_2 < 700 \\ &x_1 \text{ \& } x_2 > 0 \text{ Non negatively} \end{aligned}$$

Q.2 Solve the following LPP by graphically

$$\begin{aligned}
 \text{Min } z = & \quad 6x_1 + 14x_2 \\
 & 5x_1 + 4x_2 > 60 \\
 & 3x_1 + 7x_2 < 84 \\
 & x_1 + 2x_2 > 18 \\
 & x_1 \& x_2 > 0
 \end{aligned}$$

Q.3 Solve the following LPP by graphically

$$\begin{aligned}
 \text{Min } Z &= 4x_1 + 3x_2 \\
 \text{Subject to } & 200x_1 + 100x_2 > 4000 \\
 & x_1 + 2x_2 > 50 \\
 & 40x_1 + 40x_2 > 1400 \\
 & x_1 \& x_2 > 0
 \end{aligned}$$

Q.4 Why the simplex method is considered a general method for solving the linear programming problem? what are various steps in the solution of a problem by simple method?

Q.5 Solve the following LPP by simple method

$$\begin{aligned}
 \text{max } Z &= 100x_1 + 40x_2 \\
 \text{Subject to } & 40x_1 + 50x_2 < 900 \\
 & 3/2x_1 + 2/3x_2 < 30 \\
 & x_1 \& x_2 > 0
 \end{aligned}$$

Q.6 Solve the following LPP by simplex method

$$\begin{aligned}
 \text{max } Z &= 5x_1 + 10x_2 + 8x_3 \\
 \text{Subject to } & 3x_1 + 5x_2 + 2x_3 < 60 \\
 & 4x_1 + 4x_2 + 4x_3 < 72 \\
 & 2x_1 + 4x_2 + 5x_3 < 100 \\
 & x_1, x_2 \& x_3 > 0
 \end{aligned}$$

Q.7 Solve the following LPP by simplex method

$$\begin{aligned}
 \text{Min } Z &= 3x_1 + 2.25x_2 \\
 \text{Subject to } & 2x_1 + 4x_2 > 40 \\
 & 5x_1 + 2x_2 > 50 \\
 & x_1 \& x_2 > 0
 \end{aligned}$$

Q.8 Solve the following LPP by simplex method

$$\begin{aligned}
 \text{Minimize } Z &= 60x_1 + 80x_2 \\
 \text{Sub to } & x_2 > 200 \\
 & x_1 < 400 \\
 & x_1 + x_2 = 500 \\
 & x_1 \& x_2 > 0
 \end{aligned}$$