QUESTIONS

1. Solve the following L.P.P. graphically :

$$\begin{aligned} \textit{Minimize} \quad & z = 20x_1 + 10x_2 \\ \textit{subject to} \quad & x_1 + 2x_2 \leq 40, \\ & 3x_1 + x_2 \geq 30, \\ & 4x_1 + 3x_2 \geq 60, \\ & x_1, x_2 \geq 0. \end{aligned}$$

2. Solve the following L.P.P. graphically :

$$\begin{aligned} \textit{Maximize} \quad & z = 6x_1 + 4x_2 \\ \textit{subject to} \quad & 7x_1 + 5x_2 \leq 35, \\ & 5x_1 + 7x_2 \leq 35, \\ & 4x_1 + 3x_2 \geq 12, \\ & 3x_1 + x_2 \geq 3, \\ & x_1, x_2 \geq 0. \end{aligned}$$

3. Solve the following L.P.P. graphically :

$$\begin{aligned} \textit{Maximize} \quad & z = 3x_1 + 4x_2 \\ \textit{subject to} \quad & x_1 - x_2 \geq 0, \\ & -x_1 + 3x_2 \leq 3, \\ & x_1, x_2 \geq 0. \end{aligned}$$

4. Solve the following L.P.P. graphically :

$$\begin{aligned} \textit{Maximize} \quad & z = 6x_1 + 10x_2 \\ \textit{subject to} \quad & 3x_1 + 5x_2 \leq 10, \\ & 5x_1 + 3x_2 \leq 15, \\ & x_1, x_2 \geq 0. \end{aligned}$$

5. Find the basic feasible solutions of the following system of equations.

$$\begin{aligned} 2x_1 + 3x_2 - x_3 + 4x_4 &= 8; \\ x_1 - 2x_2 + 6x_3 - 7x_4 &= -3; \\ x_1, x_2, x_3, x_4 &\geq 0. \end{aligned}$$

6. Find all the basic solutions of the following equations and identify the basic vectors and the basic variables in each case.

$$\begin{aligned} x_1 + x_2 + x_3 &= 4; \\ 2x_1 + 5x_2 - 2x_3 &= 3. \end{aligned}$$

7. Solve the following *L.P.P.* using *simplex method*.

$$\begin{aligned} \textit{Maximize} \quad & z = 4x_1 + 7x_2 \\ \textit{subject to} \quad & 2x_1 + x_2 \leq 1000, \\ & 10x_1 + 10x_2 \leq 6000, \\ & 2x_1 + 4x_2 \leq 2000, \\ & x_1, x_2 \geq 0. \end{aligned}$$

8. Solve the following *L.P.P.* using *simplex method*.

$$\begin{aligned} \textit{Maximize} \quad & z = 3x_1 + x_2 + 3x_3 \\ \textit{subject to} \quad & 2x_1 + x_2 + x_3 \leq 2, \\ & x_1 + 2x_2 + 3x_3 \leq 5, \\ & 2x_1 + x_2 + x_3 \leq 6, \\ & x_1, x_2, x_3 \geq 0. \end{aligned}$$

9. Solve the following *L.P.P.* using *simplex method*.

$$\begin{aligned} \textit{Maximize} \quad & z = 2x_1 + 3x_2 + x_3 \\ \textit{subject to} \quad & -3x_1 + 2x_2 + 3x_3 = 8, \\ & -3x_1 + 4x_2 + 2x_3 = 7, \\ & x_1, x_2, x_3 \geq 0. \end{aligned}$$

10. Solve the following *L.P.P.* using *simplex method*.

$$\begin{aligned} \textit{Maximize} \quad & z = -2x_1 + x_2 + 3x_3 \\ \textit{subject to} \quad & x_1 - 2x_2 + 3x_3 = 2, \\ & 3x_1 + 2x_2 + 4x_3 = 1, \\ & x_1, x_2, x_3 \geq 0. \end{aligned}$$