

Question bank for UT-II  
EM-IV  
SE Comps

1) If two independent random samples of sizes 15 and 8 have respectively the following means and population standard deviations

$$\bar{X}_1 = 980 \quad \bar{X}_2 = 1012$$

$$\sigma_1 = 75, \sigma_2 = 80$$

Test the hypothesis that  $\mu_1 = \mu_2$  at 5% level of significance.

2) Use simplex method to solve the following LPP

$$\begin{aligned} \text{Maximize } Z &= 10x_1 + x_2 + x_3 \\ \text{Subject to } x_1 + x_2 - 3x_3 &\leq 10 \\ 4x_1 + x_2 + x_3 &\geq 20 \\ x_1, x_2, x_3 &\geq 0 \end{aligned}$$

3) Solve the following NLPP

$$\begin{aligned} \text{Maximize } Z &= 10x_1 + 4x_2 - 2x_1^2 - x_2^2 \\ \text{Subject to } 2x_1 + x_2 &\leq 5 \\ x_1, x_2 &\geq 0 \end{aligned}$$

4) Use Kuhn –Tucker conditions to solve the following NLPP

$$\begin{aligned} \text{Maximize } Z &= 2x_1^2 - 7x_2^2 + 12x_1x_2 \\ \text{Subject to } 2x_1 + 5x_2 &\leq 98 \\ x_1, x_2 &\geq 0 \end{aligned}$$

5) Using the Penalty (Big M) method solve the following LPP

$$\begin{aligned} \text{Maximise } Z &= 3x_1 + 2x_2 \\ \text{Subject to } 2x_1 + x_2 &\leq 2 \\ 3x_1 + 2x_2 &\geq 12 \\ x_1, x_2 &\geq 0 \end{aligned}$$

6) Use the dual simplex method to solve following LPP

$$\begin{aligned} \text{Minimize } Z &= 2x_1 + 2x_2 + 4x_3 \\ \text{Subject to } 2x_1 + 3x_2 + 5x_3 &\geq 2 \\ 3x_1 + x_2 + 7x_3 &\leq 3 \\ x_1 + 4x_2 + 6x_3 &\leq 5 \\ x_1, x_2, x_3 &\geq 0 \end{aligned}$$