ADITYA DEGREE COLLEGES

*** ANDHRA PRADESH ***

PRE FINAL - EXAMINATIONS

III B.Sc *VI SEMESTER*

STATISTICS - VI OPTIMIZATION TECHNIQUES

Max. Marks : 75 M
Time: 3 Hours

SECTION-A

I. Answer any FIVE of the following questions: 5 x 5 = 25 M

1. Define O.R.
2. Write the phases of O.R.
3. Explain the concept of slack variable and surplus variable.
4. What is linear programming problem ? How can formulate a given problem into LPP.
5. Define feasible solution and Optimum solution.
6. Explain the concept of degenerancy of LPP.
7. Explain the concept of duality in LPP.
8. Prove that the dual of dual is a Primal of LPP.

SECTION-B

II. Answer the following questions: 5 x 10 = 50 M

9. a) Explain scope of O.R.

(Or)

b) Explain Nature and features of O.R.

10. a) Solve the following LPP by using graphical method

$$\begin{aligned} Min\ Z &= 20x_1 + 10x_2 \\ Stc\quad x_1 + 2x_2 &\le 40, \\ 3x_1 + x_2 &\ge 30, \\ 4x_1 + 3x_2 &\ge 60 \\ x_1, x_2 &\ge 0 \end{aligned}$$

(Or)

b) Explain the procedure for Graphical method for solving LPP.

11. a) State and prove fundamental theorm of LPP.

(Or)

b) Solve the following problem by using simplex method.

$$\begin{aligned} Max\ Z &= 3x_1 + 2x_2 \\ Stc\quad x_1 + x_2 &\le 4, \\ x_1 - x_2 &\le 2, \\ and\ x_1, x_2 &\ge 0 \end{aligned}$$

12. a) Solve the following LPP by using Big-M method

$$\begin{aligned} Min\ Z &= 4x_1 + x_2 \\ Stc;\ 3x_1 + x_2 &= 3, \\ 4x_1 + 3x_2 &\geq 6, \\ x_1 + 2x_2 &\leq 3, \\ x_1, x_2 &\geq 0 \end{aligned}$$

(Or)

b) Explain method to Resolve degeneracy ?

13. a) Explain the formation of Dual problem

(Or)

b) Solve the following LPP by using duality

$$\begin{aligned} Max\ Z &= 6x + 8y \\ Stc\ \ 5x + 2y &\leq 20, \\ x + 2y &\geq 10 \\ x, y &\geq 0 \end{aligned}$$