

**B. N. BANDODKAR COLLEGE OF SCIENCE, THANE – 400 601.**  
**FIRST TERMINAL EXAMINATION, OCT. 2010.**  
**S.Y. B. Sc.**

**Time : 2Hrs**

**Subject : Statistics - III**

**Marks : 60**

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- N. B. :** 1. All questions are compulsory.  
2. Figures to the right indicate full marks.

- Q.1 a)** Explain slack, surplus and artificial variables in Linear Programming Problem (LPP). [3]
- b) Solve ANY 3 questions :**
- i) Represent LPP in mathematical form. [4]  
ii) Give different rules to write dual of primal of LPP. [4]  
iii) Represent transportation problem as LPP. [4]  
iv) In an assignment problem, how do you resolve the following cases. [4]  
a) Problem is of maximization  
b) Effectiveness matrix is not a square matrix.  
v) Explain graphical method of solving sequencing problem. [4]
- Q.2 a)** Explain unbalanced transportation problem. How is transportation technique applied to such problems? When is the solution  
i) degenerate and (ii) non unique. [7]
- b) Solve ANY 1 question :**
- i) Explain VAM to obtain initial basic feasible solution to transportation Problem Given the non optimum solution, how will you improve it ? [8]  
ii) Explain MODI method in transportation problem. [8]
- Q.3 a)** Define following terms in LPP (i) Feasible solution (ii) Basic feasible Solution (BFS) (iii) Degenerate and non degenerate BFS (iv) Optimum Solution (v) unbounded solution (vi) Infinitely many solutions. [7]

**P.T.O.**

**b) Solve ANY 1 question :**

- i) Explain how will you obtain solution of dual problem using primal problem. Write the dual of following LPP. [8]

$$\text{Max. } Z = 2x_1 - x_2 + x_3$$

Subject to

$$3x_1 - 4x_2 + x_3 \leq 4$$

$$6x_2 + 7x_3 \geq 5$$

$$5x_1 - 3x_3 = 7$$

$x_1, x_2$  unrestricted and  $x_3 \geq 0$

- ii) Explain graphical method of solving LPP. [8]

**Q.4 a)** What are the basic assumptions in sequencing problem ? [7]

**b) Solve ANY ONE question :** [8]

- 1) Explain Hungarian method of solving an assignment problem.
- 2) Explain the method of solving n jobs 2 machines sequencing problem.  
How will you modify this procedure if problem is having n jobs  
3 machines [8]

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