



QP CODE: 26019332



Reg No :

Name :

M.Sc DEGREE (CSS) EXAMINATION, MARCH 2026

Fourth Semester

M Sc STATISTICS

ELECTIVE - ST800401 - OPERATIONS RESEARCH

2019 Admission Onwards

5093D7B7

Time: 3 Hours

Weightage: 30

Part A (Short Answer Questions)

*Answer any **eight** questions.*

Weight 1 each.

1. State any one advantage of simplex method of solving an LPP over graphical method.
2. What do you mean by North-West corner rule in a Transportation problem?
3. Describe an unbalanced assignment problem.
4. Define a sequencing problem.
5. What are the applications of Dynamic programming problem?
6. Explain single multiplicative constraint in context of dynamic programming.
7. Define General nonlinear programming problem.
8. What are the advantageous of inventory control in an enterprise?
9. Differentiate between stochastic demand and deterministic demand.
10. Explain the terms i) Pure strategy ii) Mixed strategy.

(8×1=8 weightage)

Part B (Short Essay/Problems)

*Answer any **six** questions.*

Weight 2 each.

11. Show that Initial Basic Feasible Solution of the LPP is a vertex of the convex set of feasible solutions.





12. Using Big-M method $Min. Z = 2X_1 - X_2$ subject to
 $X_1 + X_2 \leq 4$
 $X_2 \geq 4; X_1, X_2 \geq 0$
13. Find solution using Two-Phase method.
 $Min Z = X_1 + X_2$ subject to
 $2X_1 + X_2 \geq 4$
 $X_1 + 7X_2 \geq 7$
 $X_1, X_2 \geq 0$
14. Solve the following LPP by dynamic programming $Min. Z = X_1 + 3X_2 + 4X_3$ subject to
 $2X_1 + 4X_2 + 3X_3 \geq 60$
 $3X_1 + X_2 + 3X_3 \geq 90; X_1, X_2, X_3 \geq 0$
15. Derive the Kuhn-Tucker condition for a quadratic programming problem.
16. What do you mean by EOQ with price brake?
17. Show how a game problem can be formulated as a linear programming problem.
18. Use the dominance properties to simplify the rectangular game with the following pay off and solve it graphically.
- $$P = \begin{bmatrix} 3 & -2 & 4 \\ -1 & 4 & 2 \\ 2 & 2 & 6 \end{bmatrix}$$

(6×2=12 weightage)

Part C (Essay Type Questions)

Answer any **two** questions.

Weight 5 each.

19. Explain the method of solving LPP by duality method with the help of an example.
20. What is quadratic programming problem? Explain the Beal's method for solving quadratic programming problem with example.
21. Derive EOQ formula for an inventory model with finite rate of production, constant rate of demand, incorporating set-up cost, holding cost, no shortage cost.
22. State and prove fundamental theorem of Game theory.

(2×5=10 weightage)

