

Roll No.

--	--	--	--	--	--	--	--	--	--	--	--

Total No. of Pages : 03

Total No. of Questions : 09

M.Sc.(Computer Science) (2015 & Onwards) (Sem.–3)

OPTIMIZATION TECHNIQUES

Subject Code : MSC-301

Paper ID : [A3168]

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. **SECTIONS-A, B, C & D** contains **TWO** questions each carrying **TEN** marks each and students has to attempt any **ONE** question from each **SECTION**.
2. **SECTION-E** is **COMPULSORY** consisting of **TEN** questions carrying **TWENTY** marks in all.
3. Use of non-programmable **scientific calculator** is allowed.

SECTION-A

Q1. a) Limitation of Linear Programming Problems. (5)

b) Max $Z = 17X_1 + 51X_2$ (5)

Subject to $X_1 + 16X_2 \leq 240$

$5X_1 + 2X_2 \leq 162$

$X_2 \leq 50$

Where as $X_1 \& X_2 \geq 0$

i) Find the optimal solution to the L.P.P.

ii) Discuss the effect of changing the availability from (230, 160, 40) to (240, 150, 42).

Q2. a) Explain Primal and Dual Problem. (3)

b) Use Dual Simplex Method to Solve the Problem. (7)

Min $Z = 2X_1 + 3X_3$

Subject to $2X_1 - X_2 - X_3 \geq 3$

$X_1 - X_2 + X_3 \geq 2$

Where $X_1; X_2, X_3 \geq 0$

SECTION-B

- Q3. Solve the Transportation Table to find Initial Basic Feasible Solution using **Least Cost Method**. (10)

	D1	D2	D3	D4	Supply
S1	19	30	50	10	7
S2	70	30	40	60	9
S3	40	8	70	20	18
Demand	5	8	7	14	34

- Q4. a) Differentiate between Transport and assignment problem. (3)

- b) National oil Co. has three refineries and four Depots Transportation costs per ton & requirements are given below. (7)

	D₁	D₂	D₃	D₄	Capacity
P₁	5	7	13	10	700
P₂	8	6	14	13	400
P₃	12	10	9	11	800
Requirement	300	600	700	400	

Determine optimal allocation of output.

SECTION-C

- Q5) What is probability? Explain the Addition and multiplication law of Probability. (10)
- Q6) What is dynamic programming? Explain some salient characteristics of this approach that distinguish it from other techniques of Operations research. (10)

SECTION-D

Q7) Differentiate between a Linear Programming and Integer Programming and discuss Integer Programming using suitable example. (10)

Q8) Discuss the Gomory Method using suitable example. (10)

SECTION-E

Q9) Answer briefly : (2×10)

- a) Explain Linear Programming.
- b) Discuss Degeneracy in Transportation problem.
- c) What is Decision Theory?
- d) Explain Feasible solution.
- e) Explain Branch and Bound Techniques.
- f) What do you mean by Unbalanced Transportation Problems?
- g) What is dual-primal relation?
- h) State and explain Non-Degenerate Basic feasible solution of an L.P.P.
- i) Express Addition and multiplication law of Probability.
- j) What is Operations Research?