

OPTIMIZATION TECHNIQUES

Time: 3 Hours

Max. Marks: 60

*Answer Any FIVE Questions
All Questions Carry Equal Marks*

1. a) What is meant by degeneracy in LPP? How can this be solved? Explain. 5M
 b) Solve the following LP problem by two phase method. 7M
 Maximize $Z = 5x_1 + 3x_2$
 subjected to $3x_1 + 2x_2 \geq 3$ $x_1 + 4x_2 \geq 4$ $x_1 + x_2 \leq 5$ $x_1 + x_2 \geq 0$.
2. Solve the following LP problem by graphically. 12M
 Maximize $Z = 2x_1 + x_2$ S.T $x_1 + 2x_2 \leq 10$,
 $x_1 + x_2 \leq 6$, $x_1 - x_2 \leq 2$, $x_1 - 2x_2 \leq 1$ and $x_1, x_2 \geq 0$.
3. a) Solve the following transportation problem. 7M
- | | | | | | |
|-------------|----|----|----|----|--------------|
| | | | | | Availability |
| | 9 | 16 | 15 | 9 | 15 |
| | 2 | 1 | 3 | 5 | 25 |
| | 6 | 4 | 7 | 3 | 20 |
| Requirement | 10 | 15 | 25 | 10 | |
- b) Compare transportation problem with simplex method. 5M
4. a) A firm pays Rs. 10,000 for its equipment. Their operating and maintenance costs are about Rs. 2500 per year for the first two years and then go up by approximately Rs. 1,500 per year. When such equipment replaced? The discount rate is 10% per year. 9M
 b) Write a short note on replacement. 3M
5. a) The annual demand per item is 6400 units. The unit cost is ₹ 12 and the inventory carrying charges 25% per annum. If the cost of procurement is ₹ 300 determine: i) EOQ ii) No. of orders per year
 iii) Time between 2 consecutive orders iv) Optimum cost. 8M
 b) What are the various factors affecting inventory? 4M
6. solve the game whose payoff matrix is 12M
- | | | | | | | |
|----|----|----|----|----|----|----|
| | B1 | B2 | B3 | B4 | B5 | B6 |
| A1 | 1 | 3 | -1 | 4 | 2 | -5 |
| A2 | -3 | 5 | 6 | 1 | 2 | 0 |
7. a) What is PERT? Explain. 6M
 b) Discuss about CPM and write its principle. 6M
8. a) Explain deterministic model with a simple example. 8M
 b) Derive an expression for EOQ. 4M

1 of 1