

MANAGEMENT PROGRAMME (MP)

Term-End Examination

December, 2022

MMPO-001 : OPERATIONS RESEARCH

Time : 3 hours

Maximum Marks : 100

Weightage : 70%

Note : (i) *Attempt any **five** questions.*

(ii) *All questions carry equal marks. Each question carries 20 marks.*

1. What is Operations Research ? Describe the managerial applications of Operations Research in decision-making.
2. Explain the concept and computational steps of the simplex method for solving linear programming problems. How would you identify whether an optimal solution to a problem obtained using the simplex algorithm is unique or not ?

3. Determine the basic feasible solution to the following transportation problem by using the following :
- North-West Corner Rule
 - Vogel's approximation method

Distribution Centres					
Sources	D ₁	D ₂	D ₃	D ₄	Supply
S ₁	2	3	11	7	6
S ₂	1	0	6	1	1
S ₃	5	8	15	9	10
Requirements	7	5	3	2	

4. What do you mean by goal programming ? What are the assumptions of goal programming ? Discuss the major differences between linear programming and goal programming.
5. In a game of matching coins with two players, suppose A wins one unit of value when there are two tails and loses 1/2 unit of value when there is one head and one tail. Determine the pay-off matrix, the best strategies for each player and the value of the game to A.

6. A self-service store employs one cashier at its counter. An average of nine customers arrive every 5 minutes, while the cashier can serve 10 customers in 5 minutes. Assuming Poisson distribution for arrival rate and exponential distribution for service rate, find :
- (a) The average number of customers in the system.
 - (b) The average number of customers in a queue or average queue length.
 - (c) Average time a customer spends in the system.
 - (d) Average time a customer waits before being served.
7. Write short notes on any *four* of the following :
- (a) Cardinal Value and Ordinal Value
 - (b) Non-Linear Programming
 - (c) Principle of Dominance
 - (d) Kendall's Notation
 - (e) Monte Carlo Simulation
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