(Pages : 4) **T – 5693**

Reg. No. : .....

Name : .....

Fourth Semester M.Com. Degree Examination, July 2024

Elective – Finance/Marketing

Paper IV : CO 244S : MANAGEMENT OPTIMIZATION TECHNIQUES

(2018 Admission Onwards)

Time : 3 Hours Max. Marks : 75

SECTION – A

Answer **all** questions. Each question carries **2** marks.

1. What is Slack?
2. What is Operations Research Approach?
3. What are duality in LLP?
4. Define PERT.
5. What is Payoff Matrix?
6. What is Saddle Point?
7. Define the term 'heuristic' in optimization.
8. What is MODI Method?
9. What is LPP?
10. What is Crashing?

(10 × 2 = 20 Marks)

P.T.O.

SECTION – B

Answer any **five** questions. Each question carries **5** marks.

11. Write a short note on feasible solution, basic feasible solution and optimum solution in a transportation problem.

12. Elaborate the steps in Intelligent decision-making process.

13. Explain about Vogel Approximation Method.

14. Solve the following pay-off matrix : Using minimax and maximin strategies.

	I	II	III	IV	V
1	–2	5	–3	6	7
2	4	6	8	–1	6
3	8	2	3	5	4
4	15	14	18	12	20

15. Solve the following Game

	Player B	
Player A	B1	B2
A1	a 5	b 7
A2	c 6	d 3

16. A company has three factories (F1, F2, F3) that produce a certain product, which is then distributed to four warehouses (W1, W2, W3, W4). The shipping costs (in dollars per unit) from each factory to each warehouse are as follows:

	W1	W2	W3	W4	Availability
F1	6	4	7	9	50
F2	8	5	6	10	60
F3	3	7	6	8	40
Requirement	30	50	40	30	

Solve the transportation problem using least cost method.

17. A computer repair technician finds that the time spent on repairing computers follows a normal distribution with a mean of 45 minutes and a standard deviation of 10 minutes. If the arrival of computers for repair is approximately Poisson with an average rate of 15 per 6-hour shift, what is the technician's expected idle time each shift? How many computers are ahead of the average computer just brought in?

18. The annual demand for a product is 3000 units. The unit cost is Rs. 10 and inventory carrying charges are 30% per annum- If the cost of one procurement is Rs. 180. determine:

    (a) Economic Order Quantity (EOQ).

    (b) Number of orders per year.

    (c) Time between two consecutive orders.

    (d) The total optimal cost, including purchase cost.

(5 × 5 = 25 Marks)

SECTION – C

Answer any **two** of the following questions. Each question carries **15** marks.

19. Consider a self – service store with one cashier. Assume Poisson arrival and exponential service time. Suppose that 9 customers arrive on an average every 5 minutes and the cashier can serve 10 in 5 minutes. Find

    (a) Average number of customers queuing for service.

    (b) Probability of having more than 10 customers in the system, and

    (c) Probability that a customer has to queue for more than 2 minutes.

    If the service can he speed up to 12 to 5 minutes by using a different cash register, what will be the effect on the quantities (a), (b) and (c).

20. A manufacturing company produces two types of products, A and B, with a total daily production capacity of 500 units. Each unit of A requires 2 hours of production time, and each unit of B requires 3 hours. The company has a permanent contract to supply at least 100 units of A and at least 150 units of B per day to another company- Additionally. each unit of A generates a profit of Rs. 50, and each unit of B generates a profit of Rs. 80. How many units of each product should the company produce to maximize its profit?

21. Explain the modelling techniques.

22. We have five jobs each of which must go through the machines A, B and C in order ABC. Processing times are

Job	A	B	C
1	4	5	8
2	9	6	10
3	8	2	6
4	6	3	7
5	5	4	11

Determine a sequence for the fine job that will minimize the elapsed time.

(2 × 15 = 30 Marks)