Param Pujya Dr. Babasaheb Ambedkar Smarak Samiti's

Dr. Ambedkar Institute of Management Studies & Research

Deeksha Bhoomi, Nagpur - 440010 (Maharashtra State) INDIA

NAAC Accredited with 'A' Grade

Tel: +91 712 6521204, 6521203 ,6501379
Email: info@daimsr.in

UNIT I

Operation Research

Short Answer Questions:

1. Define Operations Research. (CO1)
2. What are the three phases of the scientific method on which OR approach is based?
3. Give the main Characteristics of OR. (CO1)
4. What is the importance of OR in problem solving? (CO1)
5. What is the scope of Operations Research? (CO1)
6. What are controllable variables? (CO1) (CO2)
7. What are uncontrollable variables? (CO1) (CO2)
8. Enumerate the applications of OR in marketing? (CO1)
9. Enumerate the applications of OR in Production Management? (CO1)
10. Enumerate the applications of OR in Personnel Management? (CO1)

Long Answer Questions:

1. What is Operations Research? What are the main phases of operation research? (CO1)
2. Explain how OR aids management in Problem solving and Decision Making. What are the applications of operation research in business. (CO1)

UNIT II

Linear Programming Problems

Short Answer Questions:

1. What is an objective function? (CO2)
2. What are the assumptions of LPP? (CO2)
3. What are the advantages of LPP? (CO2)
4. What are the limitations of LPP? (CO2)
5. What is a feasible solution? (CO2)
6. What is an infeasible solution? (CO2)
7. Under what condition is t possible for an LP problem to have more than one optimal solution? (CO2)
8. What is a redundant Constraint? (CO2)
9. What is the intersection point for the two constraints $2x+4y=4$ and $4x+8y=16$? (CO2)
10. What is an unbounded solution? (CO2)

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DAIMSR

Long Answer Questions:

1. A garment manufacturer has a production line making two styles of shirts. Style I requires 200 grams of cotton thread, 300 grams of dacron thread, and 300 grams of linen thread. Style II requires 200 grams of cotton thread, 200 grams of dacron thread and 100 grams of linen thread. The manufacturer makes a net profit of Rs. 19.50 on Style 1, Rs. 15.90 on Style II. He has in hand an inventory of 24 kg of cotton thread, 26 kg of dacron thread and 22 kg of linen thread. His immediate problem is to determine a production schedule, given the current inventory to make a maximum profit. Formulate the LPP model and solve it graphically. (CO2) (CO5)

2. The ABC manufacturing company can make two products P_1 and P_2. Each of the products requires time on a cutting machine and a finishing machine. Relevant data are:

	Product	
	P_1	P_2
Cutting Hours (per unit)	2	1
Finishing Hours (per unit)	3	3
Profit (Rs. per unit)	6	4
Maximum sales (unit per week)		200

The number of cutting hours available per week is 390 and the number of finishing hours available per week is 810. How much should be produced of each product in order to achieve maximum profit for the company? (CO2) (CO5)

UNIT III

Assignment

Short Answer Questions:

1. What are the characteristics of Assignment Problems? (CO4)
2. What are the assumptions of Assignment Problems? (CO4)
3. Can there be multiple optimal solutions to an assignment problem? (CO4)
4. How would you identify the existence of multiple solutions in assignment problems? (CO4)
5. Give an algorithm to solve assignment problem. (CO4)
6. What is an unbalanced assignment problem? (CO4)
7. How are the restriction in assignment dealt with ? (CO4)
8. How is a maximization problem converted into the problem of minimization in assignment? (CO4)
9. What are the limitations of Assignment problem? (CO4)

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10. Draw the flow chart of steps in the Hungarian Method of Assignment problem. (CO4)

Long Answer Questions:

1. A travelling salesman has to visit five cities. He wishes to start from a particular city, visit each city once and then return to his starting point. The travelling distance of each city from a particular city is given below.The Salesman starts from A and comes back to A. What route should he follow so that the distance is minimum? (CO4) (CO5)

		To City				
		A	B	C	D	E
From City	A	-	1	6	8	4
	B	7	-	8	5	6
	C	6	8	-	9	7
	D	8	5	9	-	8
	E	4	6	7	8	-

2. Solve the travelling salesman problem given by the following data.
    C12=20, C13=4, C14=10, C23=5,
    C24=6, C25=10, C35=6, C45=20
    Where Cij=Cji
    And there is no route between cities I and j if the values for Cij is not given. (CO4) (CO5)

UNIT IV

Transportation

Short Answer Questions:

What are the methods of obtaining the basic feasible solution in Transportation Problem? (CO6)
1. Enumerate the steps in NWCM method. (CO6)
2. What is the difference between the LCM and NWCM method? (CO6)
3. What is opportunity cost in VAM method? (CO6)
4. With reference to transportation problem define Feasible solution. (CO6)

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5. With reference to transportation problem define Basic Feasible solution (CO6)
6. With reference to transportation problem define Optimal Solution. (CO6)
7. With reference to transportation problem define Non-degenerate basic feasible solution. (CO6)
8. What is an unbalanced transportation problem? (CO6)
9. What is degeneracy in transportation problem? (CO6)

Long Answer Questions:

1. A firm manufacturing a single product has three plants, I,II,III. They have produced 60, 35 and 40 units resp. during this month. The firm has made a commitment to sell 22 units to customer A, 45 units to customer B, 20 units to customer C, 18 units to customer D, 30 units to customer E. Find the minimum possible transportation cost of shifting the manufactured product to the five customers. The net cost of transporting the three plants to the five customers is given below: (CO6) (CO5)

	A	B	C	D	E
I	4	1	3	4	4
II	2	3	2	2	3
III	3	5	2	4	4

2. Determine an initial feasible solution to the following transportation problem by using NWCM.

	D1	D2	D3	D4	Supply
S1	1	2	1	4	30
S2	3	3	2	1	50
S3	4	2	5	9	20
Demand	20	40	30	10	

(CO6) (CO5)