R19

Code No: 863AB

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
MCA III Semester Examinations, February - 2021
OPERATIONS RESEARCH

Time: 2 hours **Max. Marks: 75**

Answer any five questions
All questions carry equal marks

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1.a) Discuss in brief the role of OR in decision making.
b) Why do some problems have multiple optimum feasible solutions? Explain. [7+8]

2. Use Big - M method to solve [15]
Minimize $Z = 12X_1 + 20X_2$,
Subjected to $6X_1 + 8X_2 \geq 100$,
$7X_1 + 12X_2 \geq 120$,
$X_1, X_2 \geq 0$

3. Find the sequence that minimize the total elapsed time required to complete the following tasks. Each job is processed in the order ACB. [15]

Job No.	1	2	3	4	5	6	7
Machine A	12	6	5	11	5	7	6
Machine B	7	8	9	4	7	8	3
Machine C	3	4	1	5	2	3	4

4. A computer contains 10,000 resisters. When any one of the resister fails, it is replaced. The cost of replacing a single resister is Rs. 10 only. If all the resisters are replaced at the same time, the cost per resister would be reduced to Rs. 3.50. The percent surviving by the end of month is given in the table below, what is the optimal plan? [15]

Month	0	1	2	3	4	5	6
% of surviving by the end of month	100	97	90	70	30	15	0

5. Find the initial solution by VAM method. Is this solution is optimal solution? If not obtain the optimal solution: [15]

Destination ► Origin ▼	D_1	D_2	D_3	D_4	Supply
O_1	23	27	16	18	30
O_2	12	17	20	51	40
O_3	22	28	12	32	53
Demand	22	35	25	41	

6. Consider the problem of assigning operators to jobs give optimal assignment [15]

Operators/ Jobs	J1	J2	J3	J4	J5	J6
A	12	10	15	22	18	8
B	10	18	25	15	16	12
C	11	10	03	8	05	9
D	6	14	10	13	13	12
E	8	12	11	7	13	10

7. Define inventory. What are different types of inventory in industries? Why is it important to control inventory? [15]

8. State Bellman's principle of optimality. Explain forward and backward recursion method. [15]

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