B.Tech. 6th Semester End-term Examination, 2021

OPERATIONS RESEARCH

Paper Code: **UPE06B20**

Full Marks: 50 Time: 2 Hrs

Group-A (2x5)

1. What is degeneracy? Explain how does one overcome it?
2. Give some important applications of queuing theory in industries.
3. What is meant by Monte Carlo simulation?
4. Mention any two differences between CPM and PERT.
5. What are the types of inventory?

Group-B (13x2)

1. A company has three production facilities S_1, S_2 and S_3 with production capacity of 7, 9 and 18 units (in 100s) per week of a product, respectively. These units are to be shipped to four warehouses D_1, D_2, D_3 and D_4 with requirement of 5, 8, 7 and 14 units (in 100s) per week, respectively. The transportation costs (in rupees) per unit between factories to warehouses are given below. Obtain an optimal solution.

	D_1	D_2	D_3	D_4	Capacity
S_1	19	30	50	10	7
S_2	70	30	40	60	9
S_3	40	8	70	20	18
Demand	5	8	7	14	34

2. Draw the A project consists of seven activities for which the relevant data are given below:

Activity	Preceding activities	Duration (days)
A	---	4
B	---	7
C	---	6
D	A, B	5
E	A, B	7
F	C, D, E	6
G	C, D, E	5

i. Draw the network.
ii. Identify the critical path and find the project completion time.

Group-C (7x2)

1. A manufacturer purchases items in lots of 800 units which is a four months requirement. The cost per unit is Rs. 100 and the ordering cost is Rs. 120 per patch order. The inventory carrying cost is estimated as 20% of the average inventory investment. i) Determine the annual variable cost managing the inventory. ii) How much saving can be obtained from the EOQ purchases?
2. Solve the following problem by using Hungarian assignment problem?

4	6	7	5	11
7	3	6	9	5
8	5	4	6	9
9	12	7	11	10
7	5	9	8	11

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