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Total No. of Pages : 03

Total No. of Questions : 07

B.Tech (Ind. Engg. & Mgt.) (Spl. in TQM) (Sem.-5)

OPERATIONS RESEARCH

Subject Code : IEM-502

Paper ID : [70993]

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. Attempt EIGHT out of TEN questions from SECTION-A carrying THREE marks each.
2. Attempt any FOUR out of SIX questions from SECTION-B carrying NINE marks each.

SECTION-A**Q1. Answer briefly :**

- a. Explain the features of OR approach.
- b. What is basic feasible solution in LPP?
- c. What do you mean by slack variable?
- d. Write limitation of LPP.
- e. What do you mean by initial basic feasible solution of a transportation problem?
- f. What is an unbalanced assignment problem?
- g. What is queue? Discuss.
- h. Explain back order cost in inventory management.
- i. Write importance of inventory models.
- j. What are the assumptions underlying common queuing model?

SECTION-B

- Q2. Write a detailed note on the role of operations research in decision making.
- Q3. Corporation has three manufacturing plants shipping to three warehouses. The production of plants (in thousands of units), requirement of the warehouses (in thousands of units), and shipping cost (in Rs.) per unit each source to each warehouse is given below:

Plants	Production	Warehouse	Requirements
PI	140	W1	180
P2	130	W2	140
P3	110	W3	70

The freight rate per unit from each plant warehouse is :

		TO		
FROM		W1	W2	W3
	PI	1.80	1.40	1.60
	P2	2.00	1.80	2.60
	P3	1.40	1.20	3.20

Determine the initial basic feasible schedule using the Northwest-Corner Method.

- Q4. Alpha Corporation has four plants each of which can manufacture any one of four products. Production costs differ from one plant to another as do sales revenue. Given the revenue and cost data below, obtain which product each plant should produce to maximize profit.

Sales revenue (Rs 1000s)

Plant	1	2	3	4
A	50	68	49	62
B	60	70	51	74
C	55	67	53	70
D	58	65	54	69

Production Cost (Rs 1000)

Plant	1	2	3	4
A	49	60	45	61
B	55	63	45	69
C	52	62	49	68
D	55	64	48	66

- Q5. Given the annual consumption of material is 3600 units, Ordering costs are Rs. 4 per order. Price unit of material is 64 paise and storage costs are 50% p.a. of stock value. Find the economic order quantity in units.
- Q6. Woods Product Ltd. Currently produce two major products, tables and chairs. When sold, each chair yields a profit of Rs. 35 and table Rs. 45. An analysis of the production work sheets reveals the following manufacturing data:

Products	Man hrs. per unit	Machine hrs. per unit
Chair	5	0.8
Table	8	1.2
Time available during the year	800 Man hours	485 Machine hours

The Company has a minimum demand for 50 chairs and a maximum demand for 25 tables during the year 2003. Construct an appropriate linear programme for maximizing the profit of Woods Product Ltd.

- Q7. Derive relationship for EOQ.