

Total No. of Questions: 07

B.Com. (2011 & Onwards) (Sem. – 3)

OPERATION RESEARCH

M Code: 22016

Subject Code: BCOP-304

Paper ID: [B1127]

Time: 3 Hrs.

Max. Marks: 60

INSTRUCTIONS TO CANDIDATES:

1. **SECTION-A is COMPULSORY** consisting of **TEN** questions carrying **TWO** marks each.
2. **SECTION-B** contains **SIX** questions carrying **TEN** marks each and students have to attempt any **FOUR** questions.

SECTION A

1. a) What is the Significance of Operations Research?
b) Write a note on slack and surplus variables in linear programming.
c) What do you mean by unbalanced transportation problem?
d) Discuss Primal Dual relationship.
e) Differentiate between pure and mixed strategies.
f) Define EOQ and state its assumptions.
g) State the rules for constructing a project network.
h) Distinguish between Merge and Burst events.
i) What is no Passing Rule in a Sequencing algorithm?
j) What is a dummy activity? Why do we need dummy activities?
2. What do you mean by Operations Research? Discuss its scope as well as limitations.
3. Ashok Chemicals Company manufactures two chemicals A and B which are sold to the manufacturers of soaps and detergent on the basis of the next month's demand, the management has decided that the total production of chemicals A and B should be at least 350 Kilograms. Moreover, a major customer's order for 125 kilograms of product A must be supplied. Product A requires two hours of processing time per kilogram and product B requires one hour of processing time per kilogram. For the coming month, 600 hours of processing time is available. The company wants to meet the above requirements at minimum total production cost. The production costs are Rs. 2 per kilogram for product A and Rs. 3 per kilogram for product B. Determine its optimal product mix and the total minimum cost.

4. a) Distinguish between PERT and CPM model, Discuss their limitations.

b) Discuss the Significance of a Sequencing Algorithm.

5. A company has four sales representatives who are to be assigned to four different sales territories. The monthly sales increase estimated for each sales representative for different sales territories (in lakhs of rupees); are shown in the following table:

Sales Representatives	Sales Territories			
	I	II	III	IV
A	200	150	170	220
B	160	120	150	140
C	190	195	190	200
D	180	175	160	190

Suggest optimal assignment and the total maximum sales increase per month.

6. Reduce the following two persons zero sum game to 2x2 order, and obtain the optimal strategies for each player and the value of the game:

		Player B			
		I	II	III	IV
Player A	1	18	4	6	4
	2	6	2	13	7
	3	11	5	17	3
	4	7	6	12	2

7. A hardware store procures and sells hardware items. Information on an item is given here:

Expected annual sales: 8,000 units

Ordering Cost: Rs. 180 per order.

Holding Cost: 10% of the average inventory value

The item can be purchased according to the following schedule:

Lot Size	Unit Price (Rs.)
1-999	Rs. 22.00
1,000-1,499	Rs. 20.00
1,500-1,999	Rs. 19.00
2,000 and above	Rs. 18.50

Determine the best order size.