

MBA 3rd Semester
Applied Operations Research
SUBJECT CODE: MB-301(2009 to 2011)
PAPER ID: {C0197}

Time : 3 hours

Maximum Marks : 60

Instructions to Candidates : Section A is Compulsory.

Attempt any FOUR question from Section B.

SECTION A (10x2=20)

I. Attempt all questions from Section A.

- i. Explain Principles of OR Models.
- ii. Differentiate between feasible and basic solution of LPP.
- iii. What is Duality?
- iv. What do you mean by Assignment Model?
- v. Explain Trans-shipment problem with example.
- vi. List two uses of Float.
- vii. Explain sensitivity analysis?
- viii. Explain Resource Levelling.
- ix. Explain Decision Tree Analysis.
- x. What are the major limitations of Game Theory?

SECTION B (4x10=40)

Attempt FOUR question from each SECTION B.

II. Using the graphical method, find the maximum value of

$$z = 7x_1 + 10x_2$$

subject to the constraints

$$x_1 + x_2 \leq 30000$$

$$x_2 \leq 12000$$

$$x_1 \geq 6000$$

$$x_1 \geq x_2$$

$$x_1, x_2 \geq 0$$

- III. A company manufactures a product from its two plants P_1 and P_2 with a capacity of 200 units and 100 units per month. It supplies the product to your shops at S_1 , S_2 , S_3 , and S_4 having a demand of 75, 100, 100 and 30 units respectively per month. The profit per unit differs with shops as given below in Rs.**

	S ₁	S ₂	S ₃	S ₄
P ₁	90	90	100	110
P ₂	50	70	130	85

- IV. The annual demand for an item is 3200 units. The unit cost is Rs. 60 and inventory carrying cost is 25% per annum. If the cost of one procurement is Rs. 150/- find out

- Economic Order Quantity
- No of orders per year
- Time between two consecutive orders
- The optimal cost

Mention assumptions made, if any.

- V. (a) Find the saddle point in the following case and also the game value.

	B	
	4	2
A	-2	-3
	-4	-5

- (b) Discuss Simulation and its application in decision making. Explain Monte Carlo simulation giving examples.

- VI. The activities, duration and direct activity costs are given below. The indirect cost is Rs. 3000 per week. Starting from the normal duration obtain the crash cost and duration of the project.

Activity	Time in Weeks		Cost		Cost to Expedite per week (Cost slope)
	Normal	Crash	Normal	Crash	
1 - 2	2	2	3000	3000	---
2 - 3	4	3	4000	5000	1000
2 - 6	8	8	6000	6000	----
3 - 4	3	2	2000	3500	1500
3 - 5	2	2	2000	2000	----
4 - 6	4	3	4000	5000	1000
5 - 6	3	3	4000	4000	----
6 - 7	8	5	8000	12000	1333

- VII. Discuss the Decision making techniques with special reference to PERT and CPM.