



II Semester M.B.A. (Day) Examination, June/July 2010
(2007-08 Scheme)
MANAGEMENT

Paper – 2.6 : Quantitative Methods and Operations Research

Time : 3 Hours

Max. Marks : 75

Instructions : Graph sheets and Statistical tables will be supplied on request.

SECTION – A

- I. Answer **any six** of the following. Each question carries **two** marks. (6×2=12)
- a) What are the basic assumptions in solving assignment problem ?
 - b) What is a dummy activity ? Why do we need it ?
 - c) Define an OR Model.
 - d) Differentiate between pure strategy and mixed strategy.
 - e) Define feasible region.
 - f) Discuss the assumptions underlying the EOQ formula.
 - g) What are the assumptions of sequencing ?
 - h) State one merit and one demerit of simulation technique.

SECTION – B

Answer **any three** questions. Each question carries **8** marks. (3×8=24)

2. Explain the need and importance of operation research.
3. A furniture manufacturing company plans to make two products – chairs and tables from its available resources, which consists of 400 board feet of timber and 450 man hours of labour. To make a chair one requires 5 board feet of timber and 10 man hours which will yield a profit of Rs. 45. To produce a table one would require 20 board feet of timber and 15 man hours and it will give a profit of Rs. 80. The problem is to determine how many chairs and tables the company should produce if its objective is to maximise the profits. Formulate this as a linear programming problem and solve it graphically.

P.T.O.



4. Using min. max and max. min principle, solve the game theory.

		Player B		
		B ₁	B ₂	B ₃
Player A	Strategy A ₁	3	-2	4
	A ₂	-1	4	2
	A ₃	2	2	6

5. The production department for a company requires 3600 kg of raw material for manufacturing a particular item per year. It has been estimated that the cost of placing an order is Rs. 40 and the cost of carrying inventory is 25% of the investment in the inventories. The price is Rs. 10 per kg. The purchasing manager wishes to determine an ordering policy for raw material.
6. What is replacement ? Why it is necessary ?

SECTION - C

Answer **any two** questions.

(12×2=24)

7. Explain the different models of operation research.
8. A project consists of the following activity and different time estimates (in days).

Activity	t _o	t _p	t _m
1-2	3	15	6
1-3	2	14	5
1-4	6	30	12
2-5	2	8	5
2-6	5	17	11
3-6	3	15	6
4-7	3	27	9
5-7	1	7	4
6-7	2	8	5



- a) Draw a network.
- b) Determine the CP and their variances.
- c) Find the earliest and latest expected times to reach each node.
- d) What is the probability that the project will be completed by 27th day and 30th day ?

9. Solve the following LPP by simplex method

Maximise $z = 5x_1 + 10x_2 + 8x_3$

s.t. $3x_1 + 5x_2 + 2x_3 \leq 60$

$4x_1 + 4x_2 + 4x_3 \leq 72$

$2x_1 + 4x_2 + 5x_3 \leq 100$

$x_1, x_2, x_3 \geq 0.$

SECTION – D

10. Case study (Compulsory).

(1×15=15)

A Co. has three plants in which it produces a standard product. It has four agencies in different parts of the country where this product is sold. The relevant data are given in the following table.

a) Plant	Weekly production Capacity (Units)	Unit production Costs (Rs.)
P ₁	400	18
P ₂	300	24
P ₃	800	20



b) Transportation cost (in Rs.) per unit.

		Agency			
		A ₁	A ₂	A ₃	A ₄
From Plant	P ₁	2	5	7	3
	P ₂	8	4	6	2
	P ₃	3	4	4	5

c) Agency	Demand (Units)	Selling Price (Rs.)
A ₁	300	32
A ₂	400	35
A ₃	300	31
A ₄	500	36

Determine the optimal plan so as to maximise the profits.
