

## II Semester M.B.A. (Day) Degree Examination, July 2011

(2007-08 Scheme)

## Management

## Paper – 2.6 : QUANTITATIVE METHODS AND OPERATIONS

## RESEARCH

Time : 3 Hours

Max. Marks : 75

*Instruction : Calculators are allowed.*

## SECTION – A

Answer **any six** questions. Each question carries **two** marks.**(6×2=12)**

1. a) Define linear programming.
- b) What is Iconic model ?
- c) What are two person zero-sum games ?
- d) What are concurrent activities ?
- e) What is group replacement ?
- f) Define critical path.
- g) What do you mean by initial basic feasible solution ?
- h) What is simulation ?
- i) What do you mean by slack variables ?

P.T.O.



## SECTION - B

Answer **any three** questions. **Each** question carries **8** marks.

(3×8=24)

2. Define OR. Explain the importance of OR in business activities.
3. Explain the different methods of Inventory under Inventory Management.
4. A company, for one of the A-class items, placed 6 orders each of size 200 in a year. Given ordering cost Rs. 600, holding cost 40%, cost per unit Rs. 40, find out the loss to the company in not operating scientific inventory policy. What are your recommendations for the future ?
5. Solve the problem of assignment for the given table to maximise the sales.

		Machines				
		A	B	C	D	E
Jobs	1	32	38	40	28	40
	2	40	24	28	21	36
	3	41	27	33	30	37
	4	22	38	41	36	36
	5	29	33	40	35	39

The five Jobs are to be processed and five machines are available. Any machine can process any job with reducing profit (in rupees) is given above.

6. There are 6 jobs each of which must go through machines A, B and C in the order ABC processing time (in hours) given in the (table) following table :

Job \ Machine	1	2	3	4	5	6
A	8	3	7	2	5	1
B	3	4	5	2	1	6
C	8	7	6	9	10	9

Determine the optimal sequence and total elapsed time.



SECTION - C

Answer any two of the following :

(2×12=24)

7. Explain the different models of OR. How these models are useful in day to day operation ?

8. Use Simplex method to solve the following LP model.

Maximise  $z = 32x_1 + 35x_2 + 45x_3$

S.t.  $2x_1 + 3x_2 + 2x_3 \leq 120$

$4x_1 + 3x_2 + x_3 \leq 160$

$3x_1 + 2x_2 + 4x_3 \leq 100$

$x_1 + x_2 + x_3 \leq 40$

$x_1, x_2, x_3 \geq 0.$

9. A Co. has 4 different factories in 4 different locations in the country and for sales agencies in four other locations in the country. The cost of production the sale price, shipping cost in the cells of matrix monthly capacities and monthly requirements are given below :

Factory	Sales Agency				Capacity	Cost of production
	1	2	3	4		
A	7	5	6	4	10	10
B	3	5	4	2	15	15
C	4	6	4	5	20	16
D	8	7	6	5	15	15
Monthly Requirements	8	12	18	22		
Selling price	20	22	25	18		



## SECTION - D

10. Case study :

Below given table has a list of activities and time estimates : (1×15=15)

Activity	Time (weeks)		
	To	Em	Tp
1 - 2 A	6	7	8
1 - 3 B	7	9	12
2 - 3 C	2	4	6
2 - 4 D	8	12	18
3 - 4 E	0	0	0
3 - 5 F	12	14	18
4 - 6 G	3	4	5
5 - 7 H	10	13	17
5 - 8 I	6	8	12
6 - 8 J	5	9	13
7 - 9 K	4	7	10
8 - 9 L	6	9	15
9 - 10 M	8	13	19

**Required :**

- 1) Construct a PERT network and determine the critical path.
- 2) Prepare a time-chart.
- 3) What is the variance and standard deviation of the project ?
- 4) What is the probability that the project will be completed within 62 weeks ?