

II Semester M.B.A. Degree Examination, June/July 2015
(2007-08 Scheme)

Management

2.6 : QUANTITATIVE METHODS AND OPERATIONS RESEARCH

Time : 3 Hours

Max. Marks : 75

Instruction : Scientific calculators are allowed.

SECTION – A

Answer **any six** questions. Each question carries **two** marks.

(6×2=12)

1. a) Define linear programming problem.
- b) What is unbalanced assignment ?
- c) What is group replacement ?
- d) What are the significance of VAM ?
- e) Define critical path.
- f) What is simulation ?
- g) What do you mean by degeneracy ?
- h) Mention the assumptions of EOQ model.

SECTION – B

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

(3×8=24)

2. "Operation research replaces management by personality". Discuss.
3. What is sequencing problem ? Give its essential characteristics.
4. A company for one of the z-class items, placed 10 orders each of size 300 in a year. Given ordering cost Rs. 750, holding cost 45%, cost per unit Rs. 35. Find out the loss to the company in not operating scientific inventory policy.

P.T.O.



5. 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 following table.

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

Determine the optimal sequence and total elapsed time.

6. 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

SECTION - C

Answer any two of the following :

(2x12=24)

7. Explain the different models of O.R. How are these models useful in day to day operation ?
8. Use the simplex method to solve the following L.P.P.

$$\text{Maximize } Z = 3x_1 + 5x_2 + 4x_3$$

$$\text{S.T. } 2x_1 + 3x_2 \leq 8$$

$$2x_2 + 5x_3 \leq 10$$

$$3x_1 + 2x_2 + 4x_3 \leq 15$$

$$\text{and } x_1, x_2, x_3 \geq 0.$$



9. Simulation of demand forecasting.

A dealer sells a particular model of washing machine for which the probability distribution of daily demand is as given below.

Demand/Week : 20 30 35 40 45 50

Probability : 0.05 0.25 0.20 0.25 0.10 0.15

Find average demand of washing machine for 10 weeks. Random numbers for 10 weeks are given below.

89 34 78 63 61 81 39 16 13 73.

SECTION - D

10. Case study **compulsory** :

(1×15=15)

Below given table has a list of activities and time estimates.

Activity	Predecessor Activity	t_o	t_m	t_p
A	-	2	4	10
B	-	3	4	5
C	A	1	2	3
D	A	4	6	14
E	B	4	5	12
F	C	3	4	6
G	D, E	1	1	8

- 1) Construct a PERT network and determine the critical path.
- 2) What is the probability that the project shall be complete within a period of 15 weeks ?
- 3) What is the probability that the project is completed within 10 and 18 weeks ?