PG – 1001

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
	1	32	38	40	28	40
	2	40	24	28	21	36
Jobs	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 : **(2×12=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.

Maximize $Z = 3x_1 + 5x_2 + 4x_3$

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

$2x_2 + 5x_3 \leq 10$

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

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 ?