II Semester M.B.A. (Day) Degree Examination, June 2009
(2007-08 Scheme)
Paper – 2.6 : QUANTITATIVE METHODS AND OPERATION RESEARCH

Time : 3 Hours   Max. Marks : 75

Instruction : Calculations must be shown in detail.

SECTION – A

Answer **any six** questions.   (6×2=12)

1. a) Define linear programming problem in general terms.

   b) What are the basic assumptions in solving assignment problem ?

   c) What are the two objectives of queueing problem solving ?

   d) State any two advantages and limitations of simulation.

   e) What do you mean by Analogue Model ?

   f) Define operation research.

   g) What is pay off matrix ?

   h) Write the importance of inventory model for management.

   i) What do you mean by unbounded solution ?

SECTION – B

Answer **any three** questions.   (3×8=24)

2. "Operation Research replaces management by personality" Comment.

3. Explain the role of linear programming in managerial decision making.

P.T.O.

4. A machine operator processes five types of items on his machine each week and must choose depends on the items prosperity on the machine and set up cost, according to its following table :

To Item

		A	B	C	D	E
	A	∞	4	7	3	4
For Item	B	4	∞	6	3	4
	C	7	6	∞	7	5
	D	3	3	7	∞	7
	E	4	4	5	7	∞

If he processes each type of item once and only once each week, how should he sequence the item on his machine in order to minimise the total set up cost ?

5. The cost associated with procurement and holding of an item are given below :

Cost per item	=	Rs. 10
Order processing cost	=	Rs. 200
Insurance for holding	=	2% of the value of inventory cost of inspection and approval of
Materials of a lot	=	Rs. 100
Interest for the locked up capital	=	15%
Annual Demand	=	1000 units
Other holding cost	=	8%
Order quantity followed	=	500 units

Find out the total cost incurred due to this item per year and examine the possibility of minimising the total cost and state the sellings in %.

6. Gupta Bakery Amritsar, keeps stock of a popular brand cake. Daily demand based on past experience is as given below :

Experience indicates :

Daily Demand	:	0	15	25	35	45	50
Probability	:	0.01	0.15	0.20	0.50	0.12	0.02

Consider the following sequence of random members :

R.No. 48, 78, 09, 51, 56, 77, 15, 14, 68, 09 using the sequence simulate the demand for the next 10 days.

Find out the stock situation if the owner of the bakery decides to make 35 cakes every day. Also estimate the daily average demand for the cakes on the basis of simulated data.

SECTION – C

Answer **any two** questions. **Each** question carries **12** marks. **(2×12=24)**

7. a) Why is a computer necessary in conducting a real world simulation ?

   b) Write a short note on :

   i) Sequencing   ii) Pure and mixed strategy

   iii) Replacement   iv) Waiting line

8. Use the Simplex method to solve the following LP problem :

   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. A Project consists of the following activity and different time estimates (in days)

			(in days)	
Activity	Precedence	a	m	b
A	–	4	6	8
B	A	10	12	16
C	A	8	12	16
D	B	4	8	12
E	D	4	6	8
F	C,D	4	8	14
G	E,F	4	8	12
H	B	2	4	6
I	H	4	8	14
J	G&I	4	6	8

a) Draw a network, b) Determine the CP and their variance, c) What is the probability that the project will be completed by 30th day ?

SECTION – D

Case study (Compulsory) :   (15×1=15)

10. Maximise for the following transportation problem as the figures inside relates to profit and not the cost of transportation :

	Warehouse			
	M_1	M_2	M_3	Requirements
F_1	7	5	5	100
F_2	7	11	9	80
F_3	10	9	9	60
Demand	110	70	40	

Determine its feasible and optimal solution.

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