II Semester M.B.A. Degree Examination, July/August 2014
(2007-08 Scheme)
Management
Paper – 2.6 : QUANTITATIVE METHODS AND OPERATIONS RESEARCH

Time : 3 Hours   Max. Marks : 75

Instruction : *Answer all Sections.*

SECTION – A

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

   a) What are non-negativity constraints ?

   b) Bring out the merits of simulation.

   c) Define transient and steady state in queuing system.

   d) Mention any four differences between PERT and CPM.

   e) Write a short note on two person zero sums game.

   f) What is an unbalanced assignment problem ?

   g) What is EOQ ?

   h) What is dummy destination ?

SECTION – B

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

2. A salesman has to visit five cities A, B, C, D and E. The distances (in hundred miles) between the five cities are as follows :

From

To	A	B	C	D	E
A	∞	7	6	8	4
B	7	∞	8	5	6
C	6	8	∞	9	7
D	8	5	9	∞	8
E	4	6	7	8	∞

If the salesman starts from City A and has to come back to City A which route he should select so that the total distance travelled is minimum.

P.T.O.

3. A company has six jobs on hand coded A to F. All the jobs have to go through 2 machines M1 and M2. The time required for the jobs on each machine in hours is given below :

	A	B	C	D	E	F
M1	1	4	6	3	5	2
M2	3	6	8	8	1	5

Draw a sequence table scheduling the six jobs on two machines.

4. Consider the following data for the activities of a project :

Activity	A	B	C	D	E	F
Immediate Predecessors	–	A	A	B, C	–	E
Duration (days)	2	3	4	6	2	8

Draw the network and find the critical path and various floats.

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. 36 and the cost of carrying inventory is 25 percent of the investment in the inventories. The price is Rs. 10 per kg. The purchase manager wishes to determine an ordering policy for the raw material.

6. Explain the various types of simulation.

SECTION – C

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

7. A company makes three products X, Y, Z out of three raw materials A, B and C. The number of units of raw materials required to produce one unit of products x, y, z is given in the following table :

	X	Y	Z
A	1	2	1
B	2	1	4
C	2	5	1

The profit per unit on the products X, Y and Z are Rs. 40, 25 and 50 respectively. The number of units of raw materials available are 36, 60 and 45 respectively.

a) Determine the product mix that will maximize the total profit. Through the final simplex table, write the solution to the dual problem and give the economic interpretation.

b) Through the final simplex table, write the solution to the dual problem and give the economic interpretation.

8. Briefly discuss the application of queuing theory in industrial management.

9. The original cost of the machine ₹ 5,000 operating costs varies as follows.

Year :	1	2	3	4	5	6	7
Operating cost (in ₹) :	400	500	700	1000	1300	1700	2100

at 9% is the discount rate of money. What should be the optimum replacement interval ?

SECTION – D

10. **Compulsory :** (1×15=15)

Solve the following transportation problem by using the :

a) NWCR

b) MMM

c) VAM

Wholesaler		A	B	C	D	E	Available units
	a	5	7	10	5	3	5
Factories	b	8	6	9	12	4	10
	c	10	9	8	10	15	10
Requirement		3	3	10	5	4	25