UNIT-IV

8. Using suitable examples, explain and illustrate :

   (i) Saddle point

   (ii) Two person zero-sum game, and

   (iii) Mixed strategies

9. Explain the process, advantages, limitations and applications of simulation.

Roll No. .....

56027

MBA 2 Year 2nd Semester (N.S.) 2011 Examination– May, 2016

OPERATION RESEARCH

Paper : MBA-207

Time : 3 hours ***Max. Marks : 80***

Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard will be entertained after the examination.

Note : Q.No. 1 of Section-A is **compulsory** having eight short questions. From Section-B, attempt **one** question from each Unit. All questions carry equal marks.

SECTION - A

1. (a) What are the assumptions of linear programming ?

(b) What is unboundedness in LPP ? Show graphically.

(c) What is an unbalanced transportation problem ? Show.

(d) How many solutions will the following assignment problem have ? Show.

	P	Q	R
A	0	4	0
B	0	0	2
C	5	0	0

(e) What is dummy activity ? Explain and illustrate.

(f) Explain the 'decision making under certainty'.

(g) What is rule of dominance ? Explain and illustrate.

(h) Describe the applications of queueing theory.

SECTION - B

UNIT - I

2. Discuss the characteristics, methodology and applications of operations research.

3. Solve the following linear programming problems graphically :

(a) Minimize $z = 3x_1 + 2x_2$

Subject to $8x_1 + x_2 \geq 8$

$2x_1 + x_2 \geq 6$

$x_1 + x_3 \geq 6$

$x_1 + 6x_3 \geq 8$

$x_1, x_2 \geq 0$

(b) Maximize $z = 50x_1 + 60x_2$

Subject to $2x_1 + 3x_2 \leq 1500$

$3x_1 + 2x_2 \leq 1500$

$x_1 \leq 400$

$x_2 \leq 400$

$2x_1 \leq 3x_2$

$x_1, x_2 \geq 0$

UNIT - II

4. Obtain the optimal solution for the following problem, for minimising the total transportation cost.

From \ To	P	Q	R	S	T	Total
A	9	12	9	6	9	5
B	7	3	7	7	5	6
C	6	5	9	11	3	2
D	6	8	11	2	2	9
Total	4	4	6	2	4	

5. Solve the following travelling salesman problem for minimising the total distance (in kms)

From \ To	A	B	C	D	E
A	–	2	5	7	1
B	6	–	3	8	2
C	8	7	–	4	7
D	12	4	6	–	5
E	1	3	2	8	–

UNIT - III

6. Various time estimates viz optimistic time (t_o), most likely time (t_m) and pessimistic time (t_p) of the activities of a project are as given below :

Activity	1-2	2-3	2-4	3-4	3-5	3-7	4-5	4-6	5-6	5-7	6-7
t_o	1	1	2	0	2	6	4	3	1	5	3
t_m	2	4	4	0	3	8	6	5	2	7	5
t_p	9	7	12	0	4	16	8	7	3	15	13

Draw the network, determine the critical path and find the probability of completing the project in 25 days.

7. The following matrix shows the pay-off for various acts and states of nature (product demand) for a product :

Act	Demand			
	High	Moderate	Low	NIL
Expand	Rs. 50,000	Rs. 25,000	Rs. 25,000	Rs. 45,000
Construct	Rs. 70,000	Rs. 30,000	Rs. 40,000	Rs. 80,000
Subcontract	Rs. 30,000	Rs. 15,000	Rs. 1,000	Rs. 10,000

Find the optimal act using :

(i) Maximax

(ii) Maximin

(iii) Minimax,

(iv) Laplace criterion