2018

MBA

MBA :2.7

OPERATIONS RESEARCH

Full Marks: 70

Time: 3 Hours

The figure in the margin indicates full marks for the questions.

Section A

Answer the following questions: **2x5=10**

1. What are essential features of the O.R.approach?
2. State any two applications of a linear programming.
3. What is balanced transportation problem?What are its applications? 1+1
4. When do you need to introduce dummy activity into your PERT network?What are the time estimates for a dummy activity? 1+1
5. Contrast the difference between linear programming and goal programming.

Section B

Answer any five from the following **4x5=20**

1. Briefly explain the uses of O.R. techniques in India.How are they found useful by the business executives?Which of the three techniques are most commonly used in India?why?
2. What are the components of linear programming model?Explain them in brief.
3. Determine the optimum strategies and value of the game

PLAYER B

PLAYER A	I	II	III	IV	V
I	-2	0	0	5	3
II	3	2	1	2	2
III	-4	-3	0	-2	6
IV	5	3	-4	2	-6

4. Explain the reasons for incorporating dummy acticvities in a network diagram.In what way do they differ from normal activities.
5. Explain the steps involved in Monte -Carlo simulation.
6. Explain the nature of travelling salesman problem and give its mathematical formulation
7. A manufacturer of furniture makes two products – chairs and tables. Processing of this product is one on two machines A and B. A chair requires 2 hours on machine A and 6 hours on machine B. A table requires 5 hours on machine A and no time on machine B. There are 16 hours of time per day available on machine A and 30 hours on machine B. Profit gained by the manufacturer from a chair and a table is Rs 2 and Rs 10 respectively. What should be the daily production of each of two products?

Section C

Answer any five from the following **8x5=40**

1. Briefly describe the Scope of Operations Research?
2. Solve the following LPP by Simplex method

   Maximize $Z = 5x_1 + 3x_2$

   Subject to constraints

   $x_1 + x_2 \leq 12$

   $5x_1 + 2x_2 \leq 10$

   $3x_1 + 8x_2 \geq 12$

   Where $x_1, x_2 \geq 0$

3. A steel company has three open hearth furnaces and five rolling mills.The transportation costs(rupees per quintal) for shipping steel from furnaces to rolling mills are given in the following table

	M_1	M_2	M_3	M_4	M_5	SUPPLY
F_1	4	2	3	2	6	8
F_2	5	4	5	2	1	12
F_3	6	5	4	7	7	14
DEMAND	4	4	6	8	8	

Obtain an initial basic feasible solution by using (i) VAM .(ii).NWCM 4+4

4. Given the following information

Jobs:	1-2	1-3	2-4	3-4	3-5	4-5	4-6	5-6
Duration:	6	5	10	3	4	6	2	9

(i) Draw the network 2

(ii) Identify critical path and total project duration 2

(iii) Determine total,free and independent float 3

5. A company manufactures around 200 mopeds.Depending upon the availability of raw materials and other conditions,the daily production has been varying from 196 mopeds to 204 mopeds,whose probability distribution is given as below:

Production/day	196	197	198	199	200	201	202	203	204
Probability	0.05	0.09	0.12	0.14	0.20	0.15	0.11	0.08	0.06

The finished mopeds are transported in a specially designed three-storyed lorry that can accommodate only 200 mopeds. Using the following 15 random numbers:

82,89,78,24,53,61,18,45,04,23,50,77,27,54,10,simulate the models waiting in the factory

(a).What will be the average number of mopeds waiting in the factory?

(b).What will be the number of empty space in the lorry?

6.What are the advantages and limitations of linear programming models?Discuss and describe the role of linear programming in managerial decision -making,bringing out limitations if any.

7. Explain the method of solving trans-shipment problem.

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