2016

MBA

PAPER : MBA 2.7

OPERATIONS RESEARCH

Full Mark : 70

Time : 3 Hrs

The figures in the margin indicate full marks for the questions

Section A

All questions are compulsory.

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

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+2

2. What are the components of linear pgogramming model? Explain them in brief. 2+2

3. Determine the optimum strategies and value of the game 4

		PLAYER B				
		I	II	III	IV	V
PLAYER A	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. The three estimates for the activities for the project are given below: 1+3

	Estimated duration(days)		
Activity	a	m	b
1-2	5	6	7
1-3	1	1	7
1-4	2	4	12
2-5	3	6	15
3-5	1	1	1
5-6	2	2	8
5-6	1	4	7

(i) Draw the project network

(ii) Calculate the length and variance of cririca path

5. Explain the steps involved in Monte -Carlo simulation. 4

6. Explain the nature of travelling salesman problem and give its mathematical formulation

7. A company owns 2 oil mills A and B which have different production capacities for low, high and medium grade oil. The company enters into a contract to supply oil to a firm every week with 12, 8, 24 barrels of each grade respectively. It costs the company Rs 1000 and Rs 800 per day to run the mills A and B. On a day A produces 6, 2, 4 barrels of each grade and B produces 2, 2, 12 barrels of each grade. Formulate an LPP to determine number of days per week each mill will be operated in order to meet the contract economically 4

SECTION C

Answer any five from the following. 8X5=40

1.Briefly describe the Scope of Operations Research? 8

2. Solve the following LPP by Simplex method 8

Maximize $Z = 5x_1 + 3x_2$

Subject to constraints

$x_1 + x_2 \leq 12$

$5x_1 + 2x_2 \leq 10$

$3x_1 + 8x_2 \leq 12$

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

(ii) Identify critical path and total project duration

(iii) Determine total,free and independent float 2+3+3

5. 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. 8

6. Explain the method of solving trans-shipment problem. 8

7. A bakery keeps stock of a popular brand of cake.Previous experience shows the daily demand pattern for thr item with associated probabilities,as given below:

Daily demand(number):	0	10	20	30	40	50
Probability:	0.01	0.20	0.15	0.50	0.12	0.02

Use the following sequence of random numbers to simulate the demand for next 10 years. Random numbers:48,78,19,51,56,77,15,14,68,9

Also estimate the daily demand for the cakes on the basis of simulated data. 4+4

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