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Total No. of Pages : 03

Total No. of Questions : 08

M.Sc.(Fashion Marketing Management) (2015 to 2017) (Sem.-3)

OPERATIONS RESEARCH

Subject Code : MSc FMM-310

Paper ID : [A3192]

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. Attempt any FIVE questions, selecting atleast ONE from EACH UNIT.
2. Each question carries TWELVE marks.

UNIT-I

1. Discuss the various phases of Operations Research.
2. A firm manufactures three products A, B and C. time to manufacture product A is twice that for B and thrice that for C and if the entire labour is engaged in making product A, 1600 units of this product can be produced. These products are produced in the ratio 3:4:5. There is demand for at least 300, 250 and 200 units of products A, B and C and the profit earned per unit is Rs.90, Rs.40 and Rs.30, respectively. Formulate the problem as a linear programming problem:

Raw material	Requirement per unit of product (kg)			Total availability (kg)
	A	B	C	
P	6	5	2	5000
Q	4	7	3	6000

UNIT-II

3. Solve the following problem graphically :

$$\text{Max } Z = -4X_1 + 3X_2$$

$$\text{Sub to } X_1 - X_2 \leq -1$$

$$X_1 \leq 4$$

$$\text{Whereas } X_1, X_2 \geq 0$$

4. Solve the following LPP by Simplex:

$$\text{Max } Z = 4X_1 + X_2 + 3X_3 + 5X_4$$

$$\text{Sub to } 4X_1 - 6X_2 - 5X_3 - 4X_4 \geq -20$$

$$-3X_1 - 2X_2 + 4X_3 + X_4 \leq 10$$

$$-8X_1 - 3X_2 + 3X_3 + 2X_4 \leq 20$$

Whereas $X_1, X_2, X_3, X_4 \geq 0$.

UNIT-III

5. Solve the following transportation problem with the help of North West Corner Method, Least Cost Entry Method and Vogel's Approximation Method:

Plant	1	2	3	4	Supply
1	2	3	11	7	6
2	1	0	6	1	1
3	5	8	15	9	10
Demand	7	5	3	2	17

6. Solve the following assignment :

	1	2	3	4	5	6
A	12	10	15	22	18	8
B	10	18	25	15	16	12
C	11	10	3	8	5	9
D	6	14	10	13	13	12
E	8	12	11	7	13	10

UNIT-IV

7. Following data regarding processing times of some jobs on three machines I, II and III. The order of processing is I, II, III. Determine the sequence that minimizes the total elapsed time required to complete the jobs. Also evaluate I and the idle time of II and III.

Jobs	A	B	C	D	E	F	G
I	3	8	7	4	9	8	7
II	4	3	2	5	1	4	3
III	6	7	5	11	5	6	12

8.

Activity	Immediate Predecessor	Time		
		Most optimistic	Most likely	Most Pessimist
A	—	4	6	8
B	A	5	7	15
C	A	4	8	12
D	B	15	20	25
E	B	10	18	26
F	C	8	9	16
G	E	4	8	12
H	D,F	1	2	3
I	G,H	6	7	8

- Draw the network and identify the critical path.
- Calculate standard deviation and variance of the project.
- Obtain in earliest and latest scheduling times of the various activities.
- Determine the probability that the project will be completed in 55 days.