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MBA

(SEM-II) THEORY EXAMINATION 2018-19

QUANTITATIVE TECHNIQUES FOR MANAGERS

Time: 3 Hours ***Total Marks: 70***

Note: 1. Attempt all Sections. If require any missing data; then choose suitably.

SECTION A

1. Attempt *all* questions in brief. 2 x 7 = 14

a. Explain the scope of Operations Research.
b. What do you mean by regret table?
c. Explain the steps involved in North-West Corner Method.
d. Define an assignment problem.
e. What do you meanby a rectangular game?
f. What is sequencing problem?
g. Differentiate between PERT & CPM.

SECTION B

2. Attempt any *three* of the following: 7 x 3 = 21

a. What is a pay off table? How is a pay off table constructed? Explain with the help of an example construction of a pay off table.

b. Solve the following LPP.

Max Z = $500x_1 + 600x_2 + 1200x_3$

Subject to:

$2x_1 + 4x_2 + 6x_3 \le 160$

$3x_1 + 2x_2 + 4x_3 \le 120$

Where $x_1, x_2, x_3 \ge 0$

c. There are five jobs to be assigned, One each to five machines and the associated cost matrix is as follows:-

		Machines				
		L	M	N	O	P
Jobs	A	11	17	8	16	20
	B	9	7	12	6	15
	C	13	16	15	12	16
	D	21	24	17	28	26
	E	14	10	12	11	15

Solve the above minimal assignment problem.

d. We have five jobs each of which must go through two machines A & B in the order AB. Processing times in hours are given in the table:

Jobs	1	2	3	4	5
Machine A (Ai)	5	1	9	3	10
Machine B (Bi)	2	6	7	8	4

Determine the sequence of the jobs that will minimize the elapsed time T. Also Calculate the total elapsed time.

e. Describe the problem of replacement of items, whose maintenance cost increase with time, assume that the value of money remains constant.

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SECTION C

3. Attempt any *one* part of the following: 7 x 1 = 7

(a) Discuss briefly the importance of Operations Research in decision making.

(b) Of the following profit pay off table, if 0·3, 0·3, 0·2, 0·2 be the probabilities of S_1, S_2, S_3, S_4 respectively then find the (i) regret table and (ii) EOL of acts

States of Nature / From	S_1	S_2	S_3	S_4
A_1	16	10	12	7
A_2	12	11	8	10
A_3	10	13	14	12

4. Attempt any *one* part of the following: 7 x 1 = 7

(a) Find the solution of the following transportation problem by vogel'sApparxmiation method. The cost matrix is given below:

To / From	A	B	C	D	E	Supply (Tons)
P	4	1	3	4	4	60
Q	2	3	2	2	3	35
R	3	5	2	4	4	40
Demand (Tons)	22	45	20	18	30	135

(b) Describe sequence of steps in MODI method of solving a transportation problem.

5. Attempt any *one* part of the following: 7 x 1 = 7

(a) Solve the following game:-

		Player Q			
		I	II	III	IV
Player P	I	6	4	8	0
	II	6	8	4	8
	III	8	4	8	0
	IV	0	8	0	16

(b) Write an illustrations note on game theory, explaining each aspect of a game.

6. Attempt any *one* part of the following: 7 x 1 = 7

(a) What do you mean by a Queue? Explain the important assumptions of a queuing model.

(b) A television repair man finds that the time spent on his job has an exponential distribution with a mean of 30 minutes. If he repairs sets in the order in which they come in, and if the arrival of sets follows a poisson distribution approximately with an average rate of 10 per hour day. What is the repiarman's expected idle time each day? What is no. of T.V. sets in the system?

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7. Attempt any *one* part of the following: 7 x 1 = 7

(a) Discuss the relative advantages and limitations of PERT and CPM in project scheduling.

(b) The activities, Predecessor activities & time estimates (in weeks) of a project are as follow:

Activity	Preceding Activity	Optimistic time (To)	Most likely time (tm)	Pessimistic time (tp)
A	—	2	3	10
B	—	2	3	4
C	A	1	2	3
D	A	4	6	14
E	B	4	5	12
F	C	3	4	5
G	D,E	1	1	7

(i) Find the expected duration and variance of each activity.

(ii) What is the expected project length?

(iii) Calculate the variance & standard deviation of the project length.

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