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MBA

(SEM-II) THEORY EXAMINATION 2018-19

QUANTITATIVE TECHNIQUES FOR MANAGEMENT

Time: 3 Hours ***Total Marks: 100***

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

SECTION A

1. Attempt *all* questions in brief. **2 x 10 = 20**

		Marks	CO
a.	What are the tools of operation research?	2	1
b.	Give some uses of operation research.	2	1
c.	What are the applications of Linear Programming in Management?	2	2
d.	What do you mean by Initial Basic Feasible solutions of a transportation problem?	2	2
e.	Distinguish between Assignment and Transportation problem.	2	3
f.	What do you mean by saddle point?	2	3
g.	Define a sequencing problem.	2	4
h.	What do you mean by arrival rate and service rate in Queuing theory?	2	4
i.	What is the importance of replacement?	2	5
j.	Explain time estimates in PERT.	2	5

SECTION B

2. Attempt any *three* of the following:

		Marks	CO
a.	Discuss the significance and scope of Operation Research in business and industry.	10	2
b.	A company produces two types of presentation goods A and B that require gold and silver. Each unit of type A requires 3 grams of silver and 1 gram of gold while that of B requires 1 grams of silver and 2 grams of golds. The company can procure 9 gms of silver and 8 gms of gold. If each unit of type A brings a profit of Rs. 40 and that of type B Rs. 50. Determine the number of units of each type that should be produced to maximize the profit. Indicate the feasible region on a graph paper.	10	1
c.	For the following game find optimal strategies of A and B and value of the game using principle of dominances.	10	3

Player B

Player A	B_1	B_2	B_3	B_4
A_1	7	6	8	9
A_2	–4	–3	9	10
A_3	3	0	4	2
A_4	10	5	–2	0

d.	At a service centre customers arrive at the rate of 10 per hour and are served at the rate of 15 per hour. Their arrival follows poisson distribution and service is exponentitally distributed. Find the average length and average waiting time in the system.	10	4
e.	Why does the problem of replacement arises? What is individual & group replacement?	10	5

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SECTION C

3. Attempt any *one* part of the following:

		Marks	CO
a.	Discuss the historical background of Operations Research.	10	1
b.	Discuss briefly the limitations of operation research techniques.	10	1

4. Attempt any *one* part of the following:

		Marks	CO
a.	Max $Z = 30x_1 + 40x_2 + 20x_3$ s.t. $10x_1 + 12x_2 + 7x_3 \leq 10{,}000$ $7x_1 + 10x2 + 8x_3 \leq 8000$ $x_1 + x_2 + x_3 \leq 1000$ Where, $x_1, x_2, x_3 \geq 0$	10	2
b.	A Cement factory manager is considering the least way to transport cement from his three manufacturing centres P, Q, R to depots A, B, C, D and E. The weekly production and demands alongwith transportation costs are given below.	10	2

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

What should be the distribution programme?

5. Attempt any *one* part of the following:

		Marks	CO
a.	The XYZ Co. has 5 jobs to be done and 5 men to do these jobs. The no. of hours each man would like to accomplish each job is given below:	10	3

		Men				
		L	M	N	O	P
Jobs	A	4	6	11	16	9
	B	5	8	16	19	9
	C	9	13	21	21	13
	D	6	6	9	11	7
	E	11	11	16	26	11

Find the optimal schedule of the above problem.

b.	Explain the theory of dominance in the solution of rectangular game.	10	3

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6. Attempt any *one* part of the following:

		Marks	CO

a. Six jobs are performed first over machine I and then over machine II. The order of the completion of the jobs has no significance. Find the sequence of the jobs that minimizes the total elpased time & Also calculate the total clapsed time. The time of each job on each machine is given below. — Marks: 10, CO: 4

Job		1	2	3	4	5	6
Time in	Machine I	4	8	3	6	7	5
Hours	Machine II	6	3	7	2	8	4

b. Explain the important assumptions of a queuing model. — Marks: 10, CO: 4

7. Attempt any *one* part of the following:

		Marks	CO

a. A transport com. buys road tankers costing Rs. 50,000 each. From the data below advise management when a tanker should be replaced. — Marks: 10, CO: 5

Year	1	2	3	4	5	6
Operating Cost (Rs.)	7500	8000	8500	9000	10000	12250
Resale Price (in Rs.)	45000	40,500	37,500	36000	34500	33250

b. Calculate average expected time, and draw network for a project with the following activity times. — Marks: 10, CO: 5

Activity	Op. time (in hrs.)	Time (in Hrs.)	Mixed Lotelly time (in hour)
2–4	1·0	5·0	3·0
2–6	1·0	7·0	4·0
4–8	4·0	16·0	7·0
6–8	1·0	5·0	1·5
8–10	1·5	14·5	3·5

Also calculate the variance and standard derivation of the project.

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