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MBA
(SEM II) THEORY EXAMINATION 2021-22
QUANTITATIVE TECHNIQUES FOR MANAGERS

Time: 3 Hours**Total Marks: 70****Note:** Attempt all Sections. If require any missing data; then choose suitably.**SECTION A****1. Attempt all questions in brief. 2x7 = 14**

a.	Define applications of Operation Research in managerial decision-making		
b.	Discuss Various methods of finding Initial basic feasible solution.		
c.	Find the value of the game.		
	Player A	Player B	
		B1	B2
	A1	2	5
	A2	6	8
d.	Illustrate Maximization Assignment Problem.		
e.	What is Johnsons Algorithm in Sequencing Problem		
f.	Describe replacement of assets which fail suddenly.		
g.	Explain crashing of operations.		

SECTION B**2. Attempt any three of the following: 7x3 = 21**

a.	Decision criterion under situation of uncertainty is governed by the attitude of the decision maker? Explain this statement		
b.	Discuss how Mathematical formulations of LP Models helps in problem solving.		
c.	Solve the game graphically.		
		B1	B2
	A1	1	-3
	A2	3	5
	A3	-1	6
	A4	4	1
	A5	2	2
	A6	-5	0
d.	Differentiate between the various behaviors of customers shown in a queue by giving relevant examples in each type.		
e.	Prepare network, activity time estimates, determine the expected project completion time & variance.		
	Activity	Time estimates (days)	
		to	tm tp
	1-2	5	8 17
	1-3	7	10 1
	2-3	3	5 7
	2-4	1	3 5
	3-4	4	6 8
	3-5	3	3 3
	4-5	3	4 5

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

a.	A vegetable vendor purchases vegetable for Rs 30 a box and sells for Rs 80 a box. The high markup reflects the perish ability of the vegetable and the great risk of stocking it., the product has no value after the first day it is offered for sale. The vendor faces the problem of how many boxes to order for tomorrow's business. A 90 day observation of the past sales gives the following information.
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Daily Sales	No. of days sold	Probability
10	28	.20
11	26	.40
12	17	.30
13	19	.10
Total	90	1.00

Determine the number of boxes he should order to maximize its profit.

b. Elaborate by example the Decision tree approach and its applications.

4. **Attempt any one part of the following:** **7x1 = 7**

a. Explain the various sequencing models that are available for solving the sequencing problems. Give suitable examples

b. Customers arrive at a sales counter manned by single person according to a Poisson process with a mean rate of 10 per hour. The time required to serve a customer has an exponential distribution with a mean of 200 seconds. Find the average waiting time of a customer, the queue length and the system length

5. **Attempt any one part of the following:** **7x1 = 7**

a. A department has four subordinates I, II, III, IV and four jobs are to be performed A, B, C, and D. The subordinates differ in efficiency and the tasks differ in their intrinsic difficulties. The estimate of cost (in Rupees) each man would take to perform each task per hour is given by:

SUBORDINATES					
		I	II	III	IV
Jobs	A	180	260	170	110
	B	130	280	140	260
	C	380	190	180	150
	D	290	260	240	100

How the tasks should be allocated to men so as to optimize the total cost.

b. Discuss Dominance Method and Graphical Method for solving Mixed Strategy Game.

6. **Attempt any one part of the following:** **7x1 = 7**

a. Explain Applications of Queue model for better service to the customers.

b. Find the sequence, total elapsed time and Idle time for Machine A and B

Job	1	2	3	4	5	6	7
Machine A	20	22	15	18	25	22	23
Machine B	12	18	20	29	17	25	30

7. **Attempt any one part of the following:** **7x1 = 7**

a. A machine costs Rs. 10000/-. Operating costs are Rs. 500 for the first five years. In the sixth and succeeding year the operating cost increases by Rs. 100/- per year. Assuming 10% value of money per year what should be the replacement year of the machine. Based on experience the management will not continue the machine after 20 years.

b. Discuss the importance and applications of PERT in project planning and control.