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Roll No
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N-501

June - July 2019

Master of Business Administration (MBA) Examination

(Full Time) (New) Second Semester

FT-201-C : OPERATION RESEARCH FOR BUSINESS DECISIONS

Time 3 Hours] [Max. Marks 80

Note : Attempt any two questions from Section A and any three questions from Section B. All questions carry equal marks.

Section A

1. (a) Define Operations Research. Discuss the advantages and limitations of Operations Research.
   (b) Discuss the role and scope of quantitative methods for decision making in business environment.

2. Explain the concept of dynamic programming and relation between dynamic and linear programming approach.

3. What is a game in game theory ? What are the properties of a game ? Explain the 'best strategy' on the basis of minimax criterion of optimality.

Section B

4. A company has factories at F_1, F_2 and F_3 that supply products to warehouses at W_1, W_2 and W_3. The weekly capacities of the factories are 200, 160 and 90 units, respectively. The weekly warehouse requirement are 180, 120 and 150 units respectively. The unit shipping cost (in Rs.) are as follows:

		Warehouses		
		W_1	W_2	W_3
Factory	F_1	16	20	12
	F_2	14	8	18
	F_3	26	24	16

Determine the optimal distribution for this company in order to minimize its total Shipping Cost.

5. A marketing manager has five salesman and five sales districts. The marketing manager estimates that the sales / month (in '00) for each salesman in each district would be as follows :

		District				
		A	B	C	D	E
Salesman	1	32	38	40	28	40
	2	40	24	28	21	36
	3	41	27	33	30	37
	4	22	38	41	36	36
	5	29	33	40	35	39

Find the assignment of salesman to district that will maximize sales.

6. A self-service store employs one cashier at its counter. An average of nine customers arrive every 5 minutes while the cashier can serve 10 customers in 5 min. Assuming Poisson distribution for arrival rate and exponential distribution for service rate, find :
   (a) Average number of customer in the system.
   (b) Average number of customer in queue.
   (c) Average time a customer spends in system.
   (d) Average time a customer waits before being served.

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7. A firm is considering the replacement of a machine, whose cost price is Rs. 12,200 and its scrap value is Rs. 200. From experience the running cost are found to be as follows :

Yr.	:	1	2	3	4	5	6	7	8
Running cost (Rs.)	:	200	500	800	1200	1800	2500	3200	4000

When should the machine be replaced ?

8. A company manufactures around 200 mopeds. Depending upon the availability of new materials and other conditions, the daily production has been varying from 196 mopeds to 204 mopeds, whose probability distribution is as given below :

Production day	:	196	197	198	199	200	201	202	203	204
Probability	:	0.05	0.09	0.12	0.14	0.20	0.15	0.11	0.08	0.06

The finished mopeds are transported in a specially designed three-stored lorry that can accommodate only 200 mopeds. Using the following 15 random numbers : 82, 89, 78, 24, 53, 61, 18, 45, 23, 50, 77, 27, 54 and 10, simulate the mopeds waiting in the factory :

(a) What will be the average no. of mopeds waiting in the factory ?

(b) What will be the no. of empty space in the lorry ?

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