Roll No. | | | | | | | | | | | | **Total No. of Pages : 03**

Total No. of Questions : 09

B.Com (Honours) (Sem.–6)

OPERATION RESEARCH

Subject Code : BCOM602-18

M.Code : 79471

Date of Examination : 19-05-2025

Time : 3 Hrs. **Max. Marks : 60**

INSTRUCTIONS TO CANDIDATES :

1. **SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.**
2. **SECTION-B consists of FOUR Sub-sections : Units-I, II, III & IV.**
3. **Each Sub-section contains TWO questions each, carrying TEN marks each.**
4. **Student has to attempt any ONE question from each Sub-section.**

SECTION - A

1. Write Briefly :

a) Limitations of operations research.

b) Big-M method

c) Travelling salesman problem

d) Decision making under uncertainty.

e) Zero-sum game

f) Probabilistic dynamic programming

g) Applications of queuing theory.

h) Construction of network

i) Individual replacement

j) Stepping stone method

SECTION - B

UNIT - I

2. A company has factories at A, B and C that supply products to warehouses at I, II and III. The weekly capacities of the factories are 200, 160 and 90 units, respectively. The weekly warehouse requirements are 180, 120 and 150 units, respectively. The unit shipping costs (in rupees are as follows):

		Warehouse		
		I	**II**	**III**
Factory	**A**	16	20	12
	B	14	8	18
	C	26	24	16

3. A marketing manager has five salesmen and five sales districts. Considering the capabilities of the salesmen and the nature of districts, the Marketing Manager estimates that the sales per month (in hundred rupees) for each salesman in each district would be as follows :

		Districts			
		I	**II**	**III**	**IV**
Salesmen	**A**	50	68	49	62
	B	60	70	51	74
	C	52	62	49	68
	D	55	64	48	66

UNIT - II

4. What are the steps involved in decision making process? Explain the types of decision making environments.

5. Explain the principle of dominance in game theory and solve the following game :

		Player B			
		B_1	B_2	B_3	B_4
Player A	A_1	3	2	4	0
	A_2	3	4	2	4
	A_3	4	2	4	0
	A_4	0	4	0	8

UNIT - III

6. What do you understand by the term queuing theory? Explain the structure of the queuing system.

7. Draw the network diagram using the following table and find out the critical path.

Activity	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**	**K**	**L**	**M**
Predecessor	—	A	B	C	A	E	E	E	H,L	K	D,F,G	J	H,L
Duration	14	4	2	1	2	3	2	4	3	12	4	2	2

UNIT - IV

8. Elaborate the deterministic demand models of inventory using suitable examples.

9. A fleet owner finds, from his past records, that the cost per year for running a vehicle whose purchase price is ` 50000 is :

Year	**1**	**2**	**3**	**4**	**5**	**6**	**7**
Running cost (Rs.)	5000	6000	7000	9000	11500	16000	18000
Resale value (Rs.)	30000	15000	7500	3750	2000	2000	2000

Compute, at what time, would it be profitable to replace the vehicle?

NOTE : Disclosure of Identity by writing Mobile No. or Marking of passing request on any paper of Answer Sheet will lead to UMC against the Student.