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

Total No. of Questions : 09

Bachelor of Commerce (Honours) (Sem.–6)

OPERATION RESEARCH

Subject Code :BCOM-602-18

M.Code :79471

Date of Examination: 03-12-2025

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

INSTRUCTIONS TO CANDIDATES :

1. **SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.**
2. **SECTIONS-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. Answer the following :

a) Scope of Operations research

b) Feasible solution

c) Hungarian method

d) Decision tree

e) Deterministic dynamic programming

f) Applications of queuing theory.

g) Crashing of network

h) Critical path

i) Inventory

j) Modified Distribution Method

SECTION-B

UNIT-I

2. The standard weight of a special purpose brick is 5 kg and it contains two basic ingredients B_1 and B_2. B_1 costs Rs. 5 per kg and B_2 costs Rs 8 per kg. Strength considerations dictate that the brick should contain not more than 4 kg of B_1 and a minimum of 2 kg of B_2. Since the demand for the product is likely to be related to the price of the brick, graphically find out the minimum cost of the brick satisfying the above conditions.

3. **Determine an initial basic feasible solution to the following transportation problem and check for its optimality :**

Source	**Destination**				
		I	**II**	**III**	**IV**	**Supply**
	A	11	13	17	14	250
	B	16	18	14	10	300
	C	21	24	13	10	400
	Demand	200	225	275	250	

UNIT-II

4. What are the various types of models used when the management is taking decsions under uncertainty? Explain with examples.

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

Player A	**Player B**					
		B1	**B_2**	**B_3**	**B_4**	**B5**
	A_1	2	4	3	8	4
	A_2	5	6	3	7	8
	A_3	6	7	9	8	7
	A_4	4	2	8	4	3

UNIT-III

6. What are the types of queuing situations? Elaborate the queuing models with Poisson's input and exponential service.

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	—	—	B	C	A,D	D	A,D	E	G,H	I	G	J,K	L
Duration	6	5	2	2	2	1	6	5	6	2	4	3	1

UNIT-IV

8. What arethe inventory costs involved in inventory control? Explain the factors affecting inventory problem analysis.

9. A truck owner finds, from his past records, that the maintenance costs per year of a truck

Year	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
Maintenance cost (Rs.)	1000	1300	1700	2000	2900	3800	4800	6000
Resale price (Rs.)	4000	2000	1200	600	500	400	400	400

Determine what time would it be profitable to replace the truck?

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.