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Total No. of Pages : 03

Total No. of Questions : 10

MBA (Sem.-3)
OPERATION RESEARCH APPLICATIONS
Subject Code : MBA-952-18
M.Code : 77056
Date of Examination : 04-01-23

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. **SECTION-A** contains **EIGHT** questions carrying **TWO** marks each and students has to attempt **ALL** questions.
2. **SECTION-B** consists of **FOUR** Subsections : Units-I, II, III & IV. Each Subsection contains **TWO** questions each carrying **EIGHT** marks each and student has to attempt any **ONE** question from each Subsection.
3. **SECTION-C** is **COMPULSORY** and consist of **ONE** Case Study carrying **TWELVE** marks.

SECTION-A

1. Write briefly :

- a) Functions of OR
- b) Managerial applications of Optimization
- c) Big-M Method
- d) Simplex Algorithm
- e) Dynamic Programming
- f) Queuing Theory
- g) PERT & CPM
- h) Slack and Float.

SECTION-B

UNIT-I

2. State the meaning of Operation Research. Explain the importance of operations, research in the decision-making process.
3. Explain briefly the various Applications of OR. What are the advantages and disadvantages of OR studies?

UNIT-II

4. Solve the following LPP using simplex method.

Maximise $Z = 6x_1 + 4x_2$

Subject to $2x_1 + 3x_2 \leq 30$

$$3x_1 + 2x_2 \leq 24$$

$$x_1 + x_2 \geq 3$$

where $x_1 + x_2 \geq 0$

5. Discuss in detail about Duality Theory and Sensitivity Analysis.

UNIT-III

6. Explain in detail, any one method for solving a transportation problem. Would you recommend this method to solve an assignment problem?
7. Solve the following transportation problem for minimum cost:

Destination	Origin				Requirements
	A	B	C	D	
1	7	4	3	4	15
2	3	2	7	5	25
3	4	4	3	7	20
4	9	7	5	3	40
Availabilities	12	8	35	25	

UNIT-IV

8. Discuss the different kinds of non-linear programming problems
9. Construct the network diagram for a project with the following activities:

Activity Event → Event	Name of Activity	Immediate Predecessor Activity
1 → 2	A	
1 → 3	B	-
1 → 4	C	-
2 → 5	D	A
3 → 6	E	B
4 → 6	F	C
5 → 6	G	D

SECTION-C

10. **Case Study :** A small project consisting of eight activities has the following characteristics:

Time-Estimates (in weeks)

Activity	Preceding Activity	Most optimistic Time (a)	Most Likely time (m)	Most Pessimistic Time (b)
A	None	2	4	12
B	None	10	12	26
C	A	8	9	10
D	A	10	15	20
E	A	7	7.5	11
F	B, C	9	9	9
G	D	3	3.5	7
H	E, F, G	5	5	5

- (a) Draw the PERT network for the project.
- (b) Prepare the activity schedule for the project.
- (c) Determine the critical path.

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