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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 : 12-06-2023

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) Scope of OR
- b) Applications of OR
- c) Definition of Linear Programming
- d) Function of Surplus in simplex procedure.
- e) Explain an assignment problem.
- f) Queuing Theory
- g) Merits and Demerits of PERT
- h) Critical Path

SECTION-B

UNIT-I

- Describe briefly the different phases of operation research.
- Describe four models used in OR.

UNIT-II

- The manager of an oil refinery must decide on the optimal mix of 2 possible blending processes of which the inputs and outputs per production run are as follows:

Process	Input		Output	
	Crude A	Crude B	Gasoline X	Gasoline Y
1	6	6	5	5
2	5	3	6	9

The maximum availability crude A & B are 250 units and 200 units respectively. The market requirement shows that at least 150 units of gasoline X and 130 units of gasoline Y must be produced. The profits per production run from process 1 and 2 are Rs. 40 and Rs.50 respectively. Formulate the problem for maximising the profit.

- What is duality? What is the significance of dual variables in simplex solution?

UNIT-III

- State the 'Principle of Optimality' in Dynamic Programming and give a mathematical formulation of Dynamic Programming.
- Find the Feasible Solution of the following transportation problem using North-West Corner Method.

		Warehouse				Supply
		W ₁	W ₂	W ₃	W ₄	
	F ₁	14	25	45	5	6
Factory	F ₂	65	25	35	55	8
	F ₃	35	3	65	15	16
Requirement		4	7	6	13	30\30

UNIT-IV

8. Give the graphical illustration to non-linear programming problems
9. A small project is composed of 7 activities whose time estimates are listed in the table below:

Activity	Optimistic Time estimate	Most Likely Time estimate	Pessimistic
1→2	1	1	7
1→3	1	4	7
1→4	2	2	8
2→5	1	1	1
3→5	2	5	14
4→6	2	5	8
5→6	3	6	15

Draw the project network.

SECTION-C

10. **Case Study :**

Solve the following assignment problem:

Typist	P	Q	R	S
A	75	50	35	45
B	70	40	70	50
C	90	60	60	55
D	85	45	30	40

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.