Total Marks: 70

3

46

3

44

7

7

### GUJARAT TECHNOLOGICAL UNIVERSITY BE - SEMESTER-V (NEW) EXAMINATION - SUMMER 2021

# Subject Code:3151910 Date:20/09/2021

## Subject Name: Operation Research

### Time:10:30 AM TO 01:00 PM

#### Instructions:

- 1. Attempt all questions.
- 2. Make suitable assumptions wherever necessary.
- 3. Figures to the right indicate full marks.
- 4. Simple and non-programmable scientific calculators are allowed.
- Q.1 (a) Explain limitations of operation research.
  - (b) Explain advantages and limitations of linear programming.
  - (c) Explain stepwise procedure to solve linear programming problem with graphical method.
- Q.2 (a) Explain different phases of Operation research.
  - (b) Explain assumptions (properties) of linear programming.
  - (c) Solve the following problem by simplex method: Maximize Z = 3x1 + 2x2 Subject to constraints
    - $2x1 + x2 \le 5$   $x1 + x2 \le 3$ and  $x1, x2 \ge 0$ .

### OR

- (c) Discuss various application areas of OR.
- Q.3 (a) What is degeneracy in transportation problem?
  - (b) The following table shows costs of transportation per unit product from plants to cities. Find the Initial basic feasible solution using Voggle's approximation method.

From/To	D	E	F	Supply
A	4	5	1	40
B	3	-4	3	60
C	6	2	8	70
Demand	70	40	60	

(c) The captain of a cricket team has to allot five middle order batting positions to 5 batsmen available for selection. The average runs scored by each batsman at these positions are summarized in a table below. Using Assignment model, determine the assignment of batsmen to positions which would give maximum runs in favor of team.

Batsman	Batting positions				
	l .	II	111	IV	N.
A.	40	46	48	3-6	48
В	48	32	36	29	4.4
C	49	3.5	41	3.8	45
D	30	46	49	44	4.4
E	37	-4.1	48	4.3	47

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