

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-VII EXAMINATION – SUMMER 2025****Subject Code:2171901****Date:23-05-2025****Subject Name: Operation Research****Time:02:30 PM TO 05:00 PM****Total Marks:70****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) Define the following terms relating the customer's behavior in queue. (a) **03**
Balking (b) Jockeying (c) Reneging
- (b) Discuss group replacement policy with suitable example. **04**
- (c) A firm uses Rs. 4500 of an item during the year. The ordering cost is Rs. 25 per order and carrying cost is 10% of the average inventory value. Find EOQ and numbers of orders per year. **07**
- Q.2** (a) Define event, activity and dummy activity with respect to CPM and PERT. **03**
- (b) Explain forward and backward planning in CPM and PERT. **04**
- (c) Define operations research. Explain any two area of feasible application of OR in your college. **07**
- OR**
- (c) Explain: Kendall's notation in terms of queuing theory. **07**
- Q.3** (a) Define slack and surplus variable with respect to linear programming problem. **03**
- (b) Explain significance of positive, zero and negative opportunity cost with respect to transportation problem. **04**
- (c) Mention different phases of operations research and explain their significance for decision making. **07**
- OR**
- Q.3** (a) Discuss various costs involved in an inventory model. **03**
- (b) How profit maximization problem can be solved in assignment technique? **04**
- (c) Write a short note on ABC analysis of inventory control technique. **07**
- Q.4** (a) Explain limitations of operation research. **03**
- (b) Explain D.R. Fulkerson's rule for network diagram. **04**
- (c) Explain zero-sum in the context of game theory. **07**
- OR**
- Q.4** (a) Differentiate between CPM & PERT. **03**
- (b) Describe the procedure to solve travelling salesman problem. **04**
- (c) Explain N-W corner method of transportation model. **07**
- Q.5** (a) List the different methods for solving game problems. **03**
- (b) Differentiate between decision making under certainty and under conflict. **04**
- (c) State and explain various characteristics of linear programming. **07**
- OR**
- Q.5** (a) Write the general mathematical formulation of a LP problem. **03**
- (b) Write the important assumptions for game theory. **04**
- (c) Write a short note on decision tree. **07**
