Roll No.						

Total No. of Pages: 02

Total No. of Questions: 09

# B.Tech. (CSE / AI&ML / CE) (Sem. – 4) DESIGN & ANALYSIS OF ALGORITHMS Subject Code: BTCS-403-18 M Code: 77629

## Date of Examination : 07-01-2023

### Time: 3 Hrs.

Max. Marks: 60

INSTRUCTIONS TO CANDIDATES:

- 1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
- 2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
- 3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

#### **SECTION-A**

- 1. Write briefly:
  - a) Discuss Depth first search algorithm.
  - b) What is travelling salesman problem?
  - c) What do you mean by minimum spanning tree.
  - d) What is flow network?
  - e) Name the approximation and Randomized Algorithms.
  - f) What is Knapsack problem?
  - g) What are the characteristics of Algorithm.
  - h) Solve the recurrence equation T(n)=9T(n/3)+n
  - i) Define dynamic programming approach
  - j) How does brute force work?

#### **SECTION-B**

- 2. Explain Bin packing problem.
- 3. Give a set S = <1,4,5,6,7,3> and W = 12. Obtain the sum of subset using backtracking approach.
- 4. Write a short note on Masters Method for solving recurrences
- 5. Explain Greedy method with suitable example
- 6. Explain Dijkstra's shortest path algorithm with suitable example. Find the time complexity for it.

## SECTION-C

7. What is topological sort? Show the ordering of vertices produced by topological sort on the following digraph.



- 8. Explain the various classes problems (i.e P, NP, NP-Complete, NP-Hard). Also show relationship among them with the help of a diagram.
- 9. Write a short note on following:
  - a) Heuristics and their characteristics
  - b) Network flow algorithm

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.