Roll No.						

Total No. of Questions : 09

B.Tech. (CSE) (Sem.-4) DISCRETE STRUCTURES Subject Code : BTCS-402 M.Code : 71106 Date of Examination : 09-01-2023

Time: 3 Hrs.

Max. Marks : 60

Total No. of Pages : 02

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

Answer briefly :

- 1. a) Out degree
 - b) Tree
 - c) Undirected Graph
 - d) Hamiltonian Circuit
 - e) Disjoint set
 - f) Transitive relation
 - g) Infix notation
 - h) Injection
 - i) Monoid
 - j) POSETS.

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SECTION-B

- Explain the following with an example : Isomorphism and Automorphism
- 3. Prove that the intersection of two equivalence relations is an equivalence relation.
- 4. Show that $Z_7 = \{0, 1, 2, 3, 4, 5, 6\}$ is a group under addition modulo 7.
- 5. State Euler formula for connected planer graphs with help of example.
- 6. Solve the recurrence relation, $a_n + 5a_{n-1} + 6a_{n-2} = 3n^2 2n + 1$

SECTION-C

- 7. Explain the concept of Dijkstra's algorithm with help of example.
- 8. Show that the edge chromatic number of a graph must be at least as large as the maximum degree of a vertex of a graph.

9. Write detailed note on:

- a) Connected components in disconnected Graph
- b) Eulerian Chain
- c) Bridge.

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.