Code No: E-5650/N/AICTE
160520733105

FACULTY OF ENGINEERING

B.E. (CSE) III-Semester (AICTE) (Main & Backlog) (New) Examination, February/ March 2023

Subject: Data Structures and Algorithms

Time: 3 Hours **Max. Marks: 70**

Note: (i) First question is compulsory and answer any four questions from the remaining six questions. Each questions carries 14 Marks.
(ii) Answer to each question must be written at one place only and in the same order as they occur in the question paper.
(iii) Missing data, if any, may be suitably assumed.

1. a) Define Time and Space complexity of an algorithm.
   b) Define a Circular Queue.
   c) Differentiate between Singly Linked List and Doubly Linked List.
   d) List out the different representations of graph.
   e) What is the difference between a Tree and a Binary tree?
   f) Define an Equivalence class?
   g) Evaluate the following postfix expression: 6 2 3 + - 3 8 2 / + * 2 3 / +.

2. a) Write about Asymptotic Notations. Give example for each.
   b) Define a Recursive Algorithm. Explain with an example.

3. a) Define a Stack. Write the ADT of a Stack.
   b) Write the algorithms for the push ( ) and pop ( ) operations on the stack.

4. a) Define (i) Hash table (ii) Static Hashing.
   b) Demonstrate Hashing using Chaining technique to resolve collisions with suitable example.

5. a) Write about the single and double rotations in AVL trees.
   b) Construct an AVL tree by inserting the following numbers in the order in which they are given. (Draw figure in each step): 17 25 19 23 75.

6. a) What are BFS and DFS? Explain with an example.
   b) Explain Kruskal's algorithm to find minimum spanning tree with an example.

7. a) Illustrate merge sort with example.
   b) Construct a Maxheap for the data: 18, 15, 25, 6, 45, and 50.

****