



**PRESIDENCY UNIVERSITY
BENGALURU**

SCHOOL OF CSE & IS

END TERM EXAMINATION – SET A

Even Semester: 2023 - 24

Date: 06-08-2024

Course Code: CSE2001

Time: 09:30AM – 12:30PM

Course Name: Data Structures and Algorithms

Max Marks: 100

Program & Sem: B.Tech IV Sem, 4EEE2

Weightage: 50%

Note: 1. Answer ALL 5 FULL Questions.

2. Each Full Question carries 20 Marks

3. Scientific and non-programmable calculator are permitted.

4. Do not write any information on the question paper other than Roll Number

1.a. What is an Abstract Data Type. (C01) (04 Marks)

1.b. Write the algorithm for converting infix expression to postfix expression. (C01) (06 Marks)

1.c. Write the algorithm using stack to convert an integer number into its equivalent binary number.

(C01) (10 Marks)

OR

2.a. Write isEmpty() function for Stack. (C01) (04 Marks)

2.b. Explain the different types of queues. (C01) (06 Marks)

2.c. Write the program for factorial calculation using recursion. (C01) (10 Marks)

3.a. Evaluate the following postfix expression $4\ 5 + 3 * 7 -$. (C02) (04 Marks)

3.b. Explain the 5 operations in the Stack Abstract Data type. (C02) (06 Marks)

3.c. Write the algorithm for the deletion at specific position in the circular singly linked list.

(C02) (10 Marks)

OR

4.a. Write the correct syntax of creating an array. (C02) (04 Marks)

4.b. Write the insert and delete methods for Doubly Linked List using the Node class.

(C02) (06 Marks)

4.c. Write the algorithm for the insertion at specific position in the circular singly linked list.

(C02) (10 Marks)

5.a. List two applications of Queue. (C03) (04 Marks)

5.b. Explain with the help of an example insertion and deletion in a Binary Search Tree. (C03) (06 Marks)

5.c. Write the following methods insert_begin(), insert_end(), display() for Singly Linked List using the Node class. (C03) (10 Marks)

OR

6.a. List two applications of Stack. (C03) (04 Marks)

6.b. Write methods for preorder, postorder and inorder traversal in a binary tree. (C03) (06 Marks)

6.c. Write the following methods delete_begin(), delete_end(), display() for Singly Linked List using the Node class. (C03) (10 Marks)

7.a. Write isEmpty() function for Queue. (C04) (04 Marks)

7.b. Analyze the time complexity of Sequential Search. (C04) (06 Marks)

7.c. Write the following functions isempty(), push(), and display() for Stack using LinkedList. (C04) (010 Marks)

OR

8.a. Evaluate the following postfix expression $4\ 5 + 9 * 3 + 3 /$. (C04) (04 Marks)

8.b. Analyze the time complexity of Binary Search algorithm. (C04) (06 Marks)

8.c. Write the following functions pop(), peek(), and display() for Stack using LinkedList. (C04) (10 Marks)

9.a. What is a local variable and instance variable. (C03) (04 Marks)

9.b. Write methods for insertion and deletion in a Binary Search Tree. (C03) (06 Marks)

9.c. Explain Directed Graph and Undirected Graph with the help of examples. (C03) (10 Marks)

OR

10.a. Write isFull() function for stack. (C04) (04 Marks)

10.b. Explain the Theta, Big-Oh and Omega asymptotic notations (C04) (06 Marks)

10.c. Analyze the time complexity of the Insertion Sort and Selection Sort. (C04) (10 Marks)