Seat No. _____

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BE SEMESTER-III Examination May-2023

Subject Name: Data Structures and Algorithms **Subject Code: CT303-N**

Date:11/5/2023 **Time: 10:00 am to 1:00 pm** **Total Marks: 70**

Instructions:

1. Answer each section in separate answer sheet.
2. Use of scientific calculator is permitted.
3. Indicate clearly, the option you attempt along with its respective question number.

Section-I

Q-1 **(A)** Difference between Linear and Non-Linear data structure. [5]

(B) Evaluate a given postfix expression and show the content of stack for each one. [5]

(i) 2 3 1 * + 9 -

(ii) 5 3 + 8 2 - *

(C) Explain circular linked list in detail. [5]

OR

(C) Explain doubly linked list in detail. [5]

Q-2 **(A)** Explain concept of priority queue. [5]

(B) Explain linked implementation of stack. [5]

OR

(A) Write an algorithm for insertion and deletion operation on circular queue. [5]

(B) Explain sparse matrix and its representation . [5]

Q-3 **(A)** Explain algorithm of Quick sort and trace it with any example. [5]

(B) Explain any two open addressing techniques to resolve a collision. [5]

OR

(A) What is hashing? Explain external and internal hashing in detail. [5]

(B) Write an algorithm for Merge sort and trace it for following data sequence [5]
35 2 55 20 80 10 40 60 5 25

Section-II

Q-4 **(A)** Define searching. Explain algorithm for Linear search. [5]

(B) Define the following terms: [5]

Degree of a node, Null graph, Binary tree, Graph, Leaf node

(C) Explain Indexed Sequential file organization. [5]

OR

(C) Explain Direct file organization. [5]

Q-5 (A) Discuss the algorithm for insertion and deletion of a given node from the binary search tree. [5]

(B) Construct AVL tree for the following data [5]
64, 1, 44, 26, 13, 110, 98

OR

(A) Explain AVL tress with example. [5]

(B) Write algorithms for pre-order and post-order traversal of a binary tree [5]

Q-6 (A) Explain BFS with example. [5]

(B) Explain Prim's algorithm for minimum spanning tree with an example. [5]

OR

(A) Explain concept of spanning tree in detail. [5]

(B) Explain Kruskal algorithm with example. [5]

----------All the Best----------