Paper / Subject Code: 50923 / Data Structure

SE-SEM-III R-20-21 DATE:- 09/06/2026 COMP Pr. CODE 1T00733

(3 Hours) Total Marks: 80

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N.B: (1) Question No. 1 is compulsory
(2) Attempt any three questions out of the remaining five questions
(3) Figures to the right indicate full marks
(4) Make suitable assumptions wherever necessary with proper justifications

Q1
A. Compare Linear and Hierarchical data structures with suitable example. [05]
B. Evaluate postfix expression *82+63-5+ using stack. Show stack status. [05]
C. Explain graph representation using: [05]
1) Adjacency Matrix
2) Adjacency List
(with example)
D. Write C functions to insert and delete elements in circular queue using linked list. [05]

Q2
A. Construct Huffman Tree for string "algorithm" and determine codes. [10]
B. Write a C program to convert infix expression to postfix using stack. [10]

Q3
A. Perform following operations on Doubly Linked List: [10]
- Insert node at beginning
- Delete last node
- Display list in reverse

Write C program.
B. Write C functions for insertion and searching in Binary Search Tree. [10]

Q
A. Construct AVL Tree for elements: 65, 24, 98, 12, 44, 71, 32, 56, 89, 5. Show rotations. [10]
B. Explain Priority Queue with applications. [05]
C. Define Topological Sorting with example. [05]

Q5
A. Insert values into hash table (size = 8) using Linear Probing: [10]
21, 34, 55, 78, 12, 43, 66 Hash function: h(k)=k mod 8.
B. Write algorithm to check balanced parenthesis using stack. [10]

Q6
A. Construct B-Tree of order 3 for: 40, 75, 22, 18, 90, 64, 51, 33. Show steps. [10]
B. Write C function for DFS traversal and explain BFS traversal. [10]

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