09-06-2026 SE CSE-AIML SEM-III C SCHEME DS QP CODE: 20012179

(3 Hours) **Total Marks: 80**

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: 1) Adjacency Matrix 2) Adjacency List (with example)	**[05]**
	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: • Insert node at beginning • Delete last node • Display list in reverse Write C program.	**[10]**
	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: 21, 34, 55, 78, 12, 43, 66 Hash function: h(k)=k mod 8.	**[10]**
	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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