Department of Artificial Intelligence & Data Science

II Year III Semester

3AID4-05: Data Structures and Algorithms

Note: Each assignment of Maximum Marks 10.All question carries equal marks.

ASSIGNMENT-I

Q1. Explain how a stack can be implemented using a static array and a dynamic array. Discuss the advantages and disadvantages of each approach.	BLT-2	CO-1
Q2. Describe how a stack can be used to convert an infix expression (e.g., A + B * (C - D)) to a postfix expression (e.g., A B C D - * +). Provide an example to illustrate your explanation.	BLT-4	CO-1

ASSIGNMENT-II

Q.1. Write an algorithm to insert an element in circular queue.	BLT-5	CO-2
Q.2. Write an algorithm to delete a node in doubly linked list.	BLT-5	CO-2
Q.3. Write an algorithm to perform following operations on singly linked list- i) To count no of nodes in linked list ii) Insertion of an element into linked list at particular location	BLT-5	CO-2
Q.4.Explain Round Robin algorithm for queue.	BLT-2	CO-2
Q.5 How to define priority queue? Explain one way and array representation of	BLT-2	CO-2

ASSIGNMENT-III

Q.1. Explain the Quick sort algorithm with suitable example.	BLT-2	CO-3
Q.2 Explain merge sort by taking a suitable example.	BLT-2	CO-3
Q.3 Apply binary search to find 194 in a list. 52, 96,101,123,149,194,213,211,285,840 (10 Elements)	BLT-5	CO-3
Q.4. Write down the algorithm for bubble sort. Explain it with the help of an example. Also, explain.	BLT-5	CO-3

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ASSIGNMENT-IV

Q.1 (a) Define Binary Search Tree. (b) Write algorithm to implement insertion operation in BST with suitable Example.	BLT-1	CO-4
Q.2 (a) What is AVL tree? Also explain different kind of Rotations in AVL tree (b) Insert the following data node in AVL tree. 50, 20, 60, 10, 8, 15, 32, 46, 11, 48	BLT-4	CO-4
Q.3 Inorder and postorder traversal for Tree is given by following sequence of nodes. Inorder: [4 ,2 ,1 ,7 , 5 , 8 , 3 , 6] Postorder : [4 ,2 , 7 , 8 , 5 , 6 , 3 , 1] Construct Binary Tree.	BLT-6	CO-4
Q.4. Write Short Note on: (a) Different types of binary tree (b) Threaded binary tree	BLT-1	CO-4

ASSIGNMENT-V

Q.1 a) Explain the difference among graph and tree? b) Explain DFS algorithm with example.	BLT-2	CO-5
Q.2. Write down the algorithm for BFS algorithm and explain it with the help of example.	BLT-4	CO-5
Q.3. Explain hashing technique with address calculation technique.	BLT-2	CO-5
Q.4. Write prim's algorithm to get minimum spanning tree out of a graph.	BLT-4	CO-5
Q.5. Perform kruskal's algorithm with help of example.	BLT-4	CO-5

*BLT: BLT shows the **Bloom's taxonomy** levels.