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| **SESSION** | **NOV-DEC2023** |
| **PROGRAM** | **MASTER OF COMPUTER APPLICATIONS (MCA)** |
| **SEMESTER** | **II** |
| **COURSE CODE & NAME** | **DCA6202 - ADVANCED DATA STRUCTURE** |
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**Assignment Set – 1**

**1. a. Discuss linear and non-linear data structures in detail.**

**b. What areasymptotic notations?**

**Ans 1.**

**Introduction to Data Structures**

**Data structures** are a fundamental aspect of computer science. They are a way of organizing and storing data in a computer so it can be accessed and modified efficiently. Data structures are broadly classified into two categories: linear and non-linear.

**Linear Data Structures**

**Linear data structures** are those in which data elements are arranged in a sequential manner. The key characteristic Its Half solved only

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**2. a. What is linked list? Explain different types of linked list.**

**b. Evaluate the value the following postfix expressions using STACK:**

**5 6 3 ^ 9 1 - + +**

**Ans 2.**

Linked lists are a fundamental data structure used in computer science to store collections of items. Unlike arrays, which store elements in contiguous memory locations, linked lists consist of nodes where each node contains a data value and a reference (or a link) to the next node in the list. This structure allows for efficient insertions and deletions of elements, as these operations do not require

**3. a. Explain binary search tree and discuss the algorithm for deleting a node from BST.**

**b. Discuss different types of rotations of AVL tree.**

**Ans 3.**

**Binary Search Tree (BST)**

A Binary Search Tree (BST) is a fundamental data structure that organizes elements in a way that facilitates fast lookup, addition, and deletion operations. In a BST, each node contains a key, and each key is unique. The key in each node must be greater than all keys stored in the left sub-tree, and less than all keys

**Assignment Set – 2**

**4.a. What is binary search? Explain with example.**

**b. Explain algorithm for BFS. Demonstrate BFS using suitable example?**

**Ans 4.**

**4.a. Understanding Binary Search**

Binary search is a highly efficient algorithm used for finding a specific element within a sorted array. Unlike linear search, which scans each element sequentially, binary search divides the search interval in half with each step, drastically reducing the time complexity.

To illustrate, imagine an

**5.a. Write an algorithm to implement bubble sort with suitable example**

**b. What is Static hashing? Discuss its disadvantages.**

**Algorithm for Bubble Sort**

Bubble Sort is a simple sorting algorithm that repeatedly steps through the list, compares adjacent elements, and swaps them if they are in the wrong order. The pass through the list is repeated until the list is sorted. Here is the algorithm:

1. **Start**

**6.a. Explain how topological sorting works.**

**b. What do you mean by external storage device? Explain its varioustypes.**

**Ans 6.**

**Topological Sorting in Advanced Data Structures**

Topological sorting is a fundamental concept in the field of computer science, particularly in the study of data structures and algorithms. It's a linear ordering of vertices in a directed graph such that for every directed edge *uv* from vertex *u* to vertex *v*, *u* comes before *v* in the ordering. This concept is crucial, especially in scenarios where certain tasks must precede others, making it a