**SESSION SEPTEMBER 2022**

**PROGRAM MASTER OF COMPUTER APPLICATION (MCA)**

**SEMESTER II**

**COURSE CODE &amp; NAME DCA6202 - Advanced Data Structure**

**Assignment Set – 1**

**1. a. Explain the advantages of linked list over arrays.**

**Ans:** Let us see how stack is implemented using linked list. As we have seen in previous section the advantages of linked list over array is that, it is not necessary to declare the size of linked list a-head and the size can be changed dynamically. So, at any point we can expand or shrink the stack size.

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**2. Define and explain the structure of AVL tree.**

**Ans: AVL tree:** An AVL tree is another balanced binary search tree named after their inventors, Adelson-Velskii and Landis. An empty binary tree is an AVL tree. A non empty binary tree T is an AVL tree if given TL and TR to be the left and right subtrees of T and h(TL) and h(TR) to be the heights of subtrees TL and TR respectively. TL and TR are AVL trees and h(TL)-h(TR) ≤ 1. h(TL) – h(TR) is known as the balance factor. AVL tree is referred in the figure.

**3. a. Define and explain the concept of binary search tree and discuss the algorithm for insertion in BST.**

**Ans:** Concept of Binary Search Tree T is a binary tree. Then T is called binary search tree if each node of n of T has the following property. The value at n is greater than every value in the left sub tree of n and is less than every value in the right sub tree of n. We can say one of the most important data structure is binary search tree. This enables one to search for and find an element with an average running

**Assignment Set – 2**

**4. a. What is static memory allocation and dynamic memory allocation?**

**Ans: Static memory allocation:** It is a memory allocation strategy in which the operating system allocates a predetermined amount of memory during build time and manages it using a data structure called stack.

**For example**, th

**b. Give algorithm/pseudocode for DFS. Demonstrate DFS using suitable example?**

**Ans:** Depth First Search (DFS) In this tutorial, you will learn about depth first search algorithm with examples and pseudocode. Also, you will learn to implement DFS in C, Java, Python, and C++. Depth first Search or Depth first traversal is a recursive algorithm for se

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

**Ans: Bubble sort Bubble sort:-** Itis a straightforward and simplistic method of sorting data that is used very commonly. The algorithm starts at the beginning of the data set. It compares the first two elements, and if the first is greater than the second, then it swaps them. It continues doing this for

**6. Explain how Dijkstra’s algorithm is used to find the shortest path of Directed weighted graph.**

**Ans: Weighted Shortest Paths -** Dijkstra’s Algorithm This algorithm is used to find the shortest path between the two vertices in a weighted directed graph and it is also very popular and efficient to find each and every path from starting (source) to terminal vertices. Let w(vi , vj ) be the weight associated