**Program- MCA**

**Course Code and Name- DCA6202- Advanced Data Structure**

**Set- I**

**1. A. What is time complexity and space comiplexity? Analyze the performance of linear Search for all possible cases.**

**Ans:** **Time complexity** is the time taken by the algorithm to execute each set of instructions. It is always better to select the most efficient algorithm when a simple problem can solve with different methods.

**Space complexity** is usually referred to as the amount of memory consumed by the algorithm. It is composed of two different spaces; Auxiliary spaceandInput space.

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**2. What is Queue data structure? Discuss the Enquence and dequence over quene using array.**

**Ans:**  This algorithm uses a queue data structure to perform the search. The effect of this is to process all nodes adjacent to the start node before we process the nodes adjacent to those nodes. If all of the edges in a graph are unweighted (or the same weight) then the first time a node is visited is the shortest path to that

**3. A. Explain the preorder traversals on binary tree.**

**Ans:** Here in preorder traversal, we start the traversal technique with the root node then proceeds towards the end of the left subtree and then towards the right sub tree. Figure 5.8(iii) shows the traversal pattern using preorder traversal.

1) Start at the root node

2) Traverse the left subtree

3) Traverse the right subtree

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**Set- II**

**4. A. Discuss any two problem which are NP- Complete.**

**Ans:** Any problem for which the answer is either in the form of YES or NO is called a decision problem. An algorithm for a decision problem is termed as decision algorithm.

Any problem that involves the identification of an optimal solution (where some value needs to be found out as minimized or maximized) is known as an optimization problem. An optimization algorithm is used to solve an

**5. What is AVL tree? How do you perform search operation inan AVL trees? Expailn with the help of an example.**

**Ans:** 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.

Operations on AVL Tree

**6. A. Expain the meaning of dynamic storage management.**

**Ans:** It uses the data structure called heap for implementing dynamic allocation. There is memory reusability and memory can be freed when not required. It is more efficient. In this memory allocation scheme, execution is slower than static memory allocation. Here memory can be released at any time during the progr