**DCA1202 – DATA STRUCTURES AND ALGORITHM**

**Assignment Set – 1**

**1. a. What is a linked list? Discuss the algorithms for the insertion and deletion of values in the beginning of a linked list.**

**Ans:** A linked list is a data structure where the objects are arranged in a linear order. Unlike an array, however, in which the linear order is determined by the array indices, the order in a linked list is determined by a pointer in Its Half solved only

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**b. Define queues and its enqueue and dequeue operations.**

**Ans: Queues** A queue is a useful data structure in programming. It is similar to the ticket queue outside a cinema hall, where the first person entering the queue is the first person who gets the ticket. There are four different types of

**2. a. What are Binary trees? How many types of Binary trees are there, discuss?**

**Ans:** A binary tree is a special case of tree where no node of a tree can have a degree of more than two. Therefore, a binary tree is a set of zero or more nodes T such that:

i) there is a specially designated

**3. Explain Breadth-first search and Depth-first search algorithms in graphs.**

**Ans: Breadth-first search:** 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

**Assignment Set – 2**

**4. a. Explain the algorithms of Sequential Searching and Binary Searching.**

**Ans: Sequential Searching:** The simplest type of searching process is the sequential search or linear search. In the sequential search, each element of the array is compared to the key, in the order it appears in the array, until the first element matching the key is found. If you are looking for an element that is near the front of the array, the sequential search will find it quickly. The more data that

**b. What are the characteristics and Building Blocks of an Algorithm?**

**Ans: Characteristics of an Algorithm**

**Finiteness**

An algorithm must terminate after a finite number of steps and further each step must be executable in finite amount of time. In order to establish a sequence of steps as an algorithm, it should be

**5. a. How is the Efficiency of an Algorithm measured?**

**Ans:** If a problem is algorithmically solvable then it may have more than one algorithmic solution. Mainly, the two computer resources taken into consideration for efficiency measures are time and space requirements for executing the program corresponding to the solution/algorithm. We will restrict to only

**b. What is Divide and conquer strategy?**

**Ans:** Given a function to compute on n inputs, the divide-and-conquer strategy suggests splitting the inputs into K distinct subsets, 1<K<n, yielding K subproblems. These subproblems must be solved and then a method must be found to combine subsolutions into a solution as a whole. If the subproblems

**6. Discuss the Greedy knapsack Algorithm, with a suitable**

**Ans:** The Greedy algorithm could be understood very well with a well-known problem referred to as Knapsack problem. Although the same problem could be solved by employing other algorithmic approaches, Greedy approach solves Fractional Knapsack problem reasonably in a good