1.What exactly is an application tree?

a)

1.One reason to use trees might be because you want to store information that naturally forms a hierarchy. For example, the file system on a computer.

2.Binary Search Tree is a tree that allows fast search, insert, delete on a sorted data. It also allows finding closest item.

3.Heap is a tree data structure which is implemented using arrays and used to implement priority queues.

2. What is pre-order tree traversal and how does it work?

a)

Pre order is a tree traversal technique.

To traverse a binary tree in pre-order, following operations are

carried-out

(i) Visit the root, and

(ii) Traverse the left most subtree starting at the left external node,

(iii) Traverse the right subtree starting at the right external node.

3. What is the problem with the Hanoi Tower?

a)

Tower of Hanoi is a mathematical puzzle where we have three rods and n disks. The objective is to move the entire stack to another rod, obeying the following simple rules:

i)Only one disk can be moved at a time.

ii)Each move consists of taking the upper disk from one of the stacks and placing it on top of another stack i.e. a disk can only be moved if it is the uppermost disk on a stack.

iii)No disk may be placed on top of a smaller disk.

4. Can you explain the distinction between linear and nonlinear data structures?

Data structure where data elements are arranged sequentially or linearly where the elements are attached to its previous and next adjacent in what is called a linear data structure. In linear data structure, single level is involved. Therefore, we can traverse all the elements in single run only. Linear data structures are easy to implement because computer memory is arranged in a linear way. Its examples are array, stack, queue, linked list, etc.

Data structures where data elements are not arranged sequentially or linearly are called non-linear data structures. In a non-linear data structure, single level is not involved. Therefore, we can't traverse all the elements in single run only. Non-linear data structures are not easy to implement in comparison to linear data structure. It utilizes computer memory efficiently in comparison to a linear data structure. Its examples are trees and graphs.

5. What is the distinction between a list and an array?

i)The main difference between list and array is that list is a collection of items which may contain elements of multiple datatypes where array has only homogeneous elements.

ii)list supports negative indexing whereas array does not support negative indexing.