- **What is distinguish between list and array?**

List	Array
• Support different data types • Not require any loop to print the elements in an array • Comparatively slower than array • Used to store small amount of data	• Supports same data type • Require a loop to print an element in an array • Comparatively faster than list • Used to store large amount of data

- **What are the qualities of a binary tree?**

- Only one node should be the root of the binary tree

- Every node should contain at most 2 child nodes

- Left side nodes are less than the root node

- Right side nodes are greater than the root node

3. What is the Best way to combine two balanced binary search trees?

Take two arrays which contain the inorder traversals of two binary trees. Created another array that contain the sorted form of merging two arrays then convert the sorted array to the well-balanced binary search tree

4. How would you describe heap in detail?

Heap is a specialized data structure that can construct and satisfies the property of heap. In a max heap key value of a parent node is greater than the children node and vice versa in min heap

- Each element in the array represents a node of the heap

- The highest priority element is always sorted at the root

- Heap is a partially ordered structured

- When a heap is a complete binary tree, it has a smallest possible height a heap with n nodes and a branch for each node has log N height

Applications

- Heap gives the constant time complexity while getting the min element and max element

- Heap gives very accurate results while getting the kth smallest or kth largest element in an array

5. In terms of data structures what is a hash map?

A Structure that maps key to the value. Key is finding using the different hash functions. Hash map is nothing but key-value pair like dictionary in python. Every element should contain unique key. Hash map is the most efficient way to insert or delete the elements in a n array in fact it gives the constant time complexity.

6. How do you explain complexities of time and space?

Time complexity: Time required to complete the given problem statement. Time complexity talks about the efficiency of the solution of the given problem statements. Usually, time complexity is measured using Big O notation which is nothing but worst-case time complexity.

Example: O(n)

O(n) tells that the given problem statement takes n units of time to complete the problem

Space complexity: Memory required to complete the given problem in very efficient way is called space complexity

7. How do you recursively sort a stack?

Popping all elements in the stack which follows LIFO operation in a recursive manner.When the stack becomes empty. Insert all those elements in the stack in a sorted order. Then the given stack is sorted