**DSA Viva Questions**

1. **What is adt and why is it used?**

Abstract Data Type(ADT) is a data type, where only behavior is defined but not implementation.

**2. Double ended queue**

A deque, also known as a double-ended queue, is **an ordered collection of items similar to the queue**. It has two ends, a front and a rear, and the items remain positioned in the collection.

**3. Variants of double ended queue**

There are two types of deques. These two types are due to the restrictions put to perform either the insertions or deletions only at one end. They are, **(i) Input-restricted deque (ii) Output-restricted deque.**

**4. Ek logical tha...ki ek linked list me agar ek word stored h to kuch letters dhoondne h... how many traversals are required...and justify**

**5. Trees, linked lists, queue, traversal in linked list and stack**

**6. Decimal to binary**

To convert a decimal number to binary number, we need **to divide the number by 2 until it reaches 0 or 1**. And in each step, the remainder are stored separately to form the binary equivalent number in reverse order.

**7. Decimal to octal**

1. Store the remainder when the number is divided by 8 in an array.
2. Divide the number by 8 now
3. Repeat the above two steps until the number is not equal to 0.
4. Print the array in reverse order now.

**8. How to convert decimal to octal numbers and store it as different digits in different indexes**

1. Store the remainder when the number is divided by 8 in an array.
2. Divide the number by 8 now
3. Repeat the above two steps until the number is not equal to 0.
4. Print the array in reverse order now.

**9. Explain what is data structures and its use**

**Ans : data structure is organizing the data in such a way that retrival is fast and accurate**

Data structures provide a means to manage large amounts of data efficiently for uses such as **large databases and internet indexing services**.

**10. Dangling pointer**

Dangling pointers and wild pointers in computer programming are **pointers that do not point to a valid object of the appropriate type**. ... If the program writes to memory referenced by a dangling pointer, a silent corruption of unrelated data may result, leading to subtle bugs that can be extremely difficult to find.

**11. What is circular queue it's advantage and application**

Circular Queue is **a linear data structure in which the operations are performed based on FIFO** (First In First Out) principle and the last position is connected back to the first position to make a circle.

Advantages. Circular Queues offer **a quick and clean way to store FIFO data with a maximum size**. Doesn't use dynamic memory → No memory leaks. Conserves memory as we only store up to our capacity (opposed to a queue which could continue to grow if input outpaces output.) Simple Implementation → easy to trust and test

**12. What is priority queue and its advantage and application**

Priority Queueis an abstract data type, which is similar to a queue, however, in the priority queue, every element has some priority. The priority of the elements in a priority queue determines the order in which elements are removed from the priority queue.

**13. Time complexity of Traversal in a linked list containing n elements : O(n)**

**14. Time complexity of insertion of node**

Simply inserting a node is **O(1) for 2 operations**. The pointer to next of the previous node is set to point to this node. The next of this current node is set to the next of the previous node.

**15. Time complexity of deletion of node**

In cases where the node to be deleted is known only by value, the list has to be searched and the time complexity becomes O(n) in both singly- and doubly-linked lists.

**16. What is heap sort?**

Heap sort is a comparison-based sorting technique based on Binary Heap data structure. It is similar to selection sort where we first find the minimum element and place the minimum element at the beginning. We repeat the same process for the remaining elements.

**17. What is a pivot element?**

The pivot or pivot element is **the element of a matrix, or an array**, which is selected first by an algorithm (e.g., Gaussian elimination, simplex algorithm, etc.), to do certain calculations.

**18. What’s tree?**

A tree is non-linear and a hierarchical data structure consisting of a collection of nodes such that each node of the tree stores a value, a list of references to nodes (the “children”).

**19. What’s stack?**

Stack is a linear data structure which follows a particular order in which the operations are performed. The order may be LIFO (Last in First Out) or FILO (First in Last Out).

**20. What’s graph?**

A Graph consists of a finite set of vertices (or nodes) and set of Edges which connect a pair of nodes.

**Linear data type stack array queue L.L**

**Non linear data type**