1. Understand Linked Lists:

Explain the different types of linked lists (Singly Linked List, Doubly Linked List).

Ans: 1. Singly Linked List- A linked list where each node contains a value and a reference (or pointer) to the next node in the sequence. The list starts with a head node and ends with a node pointing to null.

2. Doubly Linked List-A linked list where each node contains a value, a reference to the

next node, and a reference to the previous node. It allows traversal in both directions.

4. Analysis:

Analyze the time complexity of each operation.

Ans: Add: O(n) in the worst case , O(1) if adding element at the beginning

Search: O(n)

Traverse: O(n)

Delete: O(n) in the worst case

Discuss the advantages of linked lists over arrays for dynamic data.

Linked lists can grow or shrink in size dynamically, avoiding the fixed-size limitation of arrays. Inserting or deleting elements, especially in the middle, is more efficient O(1) if the node is known compared to arrays O(n) and no need for contiguous memory allocation; nodes can be scattered in memory, making better use of available space.