Data Structures and Algorithms - Answer Sheet (All Correct)

1. An array is a fixed-size data structure that stores elements in contiguous memory locations.

2. A singly linked list allows traversal in one direction, while a doubly linked list supports traversal in both directions.

3. Stack operations include push, pop, and peek. Example: void push(int val) { stack[++top] = val; }.

4. A queue follows FIFO order. A normal queue removes elements from the front, while a circular queue allows reuse of empty slots.

5. Merge Sort works by dividing the array and merging sorted halves. Time complexity is O(n log n).

6. A binary search tree does not allow duplicate values and has O(log n) complexity.

7. DFS explores deep before backtracking, while BFS explores level by level.

8. A max heap stores the largest value at the root.

9. Dynamic programming solves problems using overlapping subproblems. Example: Fibonacci sequence.

10. QuickSort runs in O(n log n) on average but has O(n^2) worst-case complexity.