Data Structures and Algorithms - Question Paper

Instructions:

1. Answer all questions.
2. Each question carries equal marks.
3. Use appropriate algorithms and explanations where necessary.

1. Define an array and explain its advantages and disadvantages.

2. Explain the difference between singly linked lists and doubly linked lists with examples.

3. Describe stack operations and write a program to implement a stack using an array.

4. What is a queue? Explain the difference between a normal queue and a circular queue.

5. Explain the working of merge sort with an example.

6. What is a binary search tree? Explain its operations with an example.

7. Compare and contrast depth-first search (DFS) and breadth-first search (BFS).

8. Write an algorithm for inserting and deleting an element in a max heap.

9. Explain the concept of dynamic programming with an example.

10. Describe the time and space complexity of QuickSort algorithm.