Q1. Define data structure. Give examples. (3 marks)
Ans:

Q2. What is the time complexity of binary search in a sorted array? (2 marks)
Ans:

Q3. Choose the correct options: (3 marks)
(i) Which of the following is a linear data structure? (1 marks)
A. Array B. Binary Tree C. Graph D. Hash Table
Ans (i):

(ii) Which data structure uses LIFO principle? (1 marks)
A. Queue B. Tree C. Stack D. Linked List
Ans (ii):

(iii) Which traversal is used in Depth-First Search? (1 marks)
A. Level Order B. Preorder C. Breadth First D. Postorder
Ans (iii):

Q4. Differentiate between Stack and Queue. (3 marks)
Ans:

Q5. Answer the following: (3 marks)

(i) What is a circular linked list? (1 marks)
Ans (i):

(ii) What is the maximum number of children a binary tree node can have? (1 marks)
Ans (ii):

(iii) What is the worst-case time complexity of Quick Sort? (1 marks)
Ans (iii):

Q6. Explain the operations on a queue with suitable examples. (2 marks)
Ans:

Q7. Fill in the blanks: (2 marks)
(i) A binary tree with all levels filled except possibly the last, which is filled from left to right, is called a _____. (1 marks)
Ans (i):

(ii) The minimum number of nodes in an AVL tree of height 3 is _____. (1 marks)
Ans (ii):

Q8. Explain the concept of a stack and its applications. (5 marks)
Ans:

Q9. What is a binary search tree (BST) and how is it different from a binary tree? (5 marks)

Ans:

Q10. Define dynamic programming and give an example. (5 marks)
Ans:

Q11. What is a graph? Explain BFS and DFS traversal techniques. (5 marks)
Ans:

Q12. What are heap data structures and their types? (5 marks)

Ans:

Q13. What is hashing and explain its applications? (5 marks)

Ans: