

Short Answer (1 Word or 1 Line)

1. Convert the following infix expression to postfix notation: $(A+B)/(C-D)$
2. You have an array of n integers. What is the space complexity of storing this array in memory?
3. What will be the time complexity of the following code?

```
int i = 0;
while (i < n) {
    i = i + 1;
    i = i * 2;
}
```
4. You have a recursive function that calls itself n times. What is the space complexity of the function call stack?
5. List two applications of a Stack in Real Life.
6. List two applications of a Queue in Real Life.
7. Convert the following infix expression to prefix notation: $(A+B)/(C-D)$
8. Convert the following infix expression to postfix notation: $(A+B)*C$
9. You are implementing a stack data structure that can hold up to n elements. What is the space complexity of the stack?
10. Which principle does a stack follow: LIFO or FIFO?
11. Define : Data Structure
12. Define : Algorithm
13. Define : Priority Queue
14. What will be the time complexity of the loop `for(i=0; i<n; i++){ }` ?
15. What will be the space complexity of statement `sum=a+b` ?
16. Define : Recursion

Long Answer (40 - 100 Words)

1. Write the differences between Stack and Queue data structures in terms of their functionality and use cases.
2. Differentiate between Primitive Data Types and Non-Primitive Data Types. Illustrate your answer with examples and explain how each type is used in programming.
3. Write an Algorithm to solve the Tower of Hanoi problem using recursion.
4. Define a data structure and explain its role in organizing and managing data in software applications. Discuss the various operations that can be performed on data structures and provide examples.
5. Write an algorithm to perform insert, delete, and display operations using a simple queue.
6. Write an Algorithm to solve the Fibonacci series problem using recursion.
7. Explain the concept of a queue and its applications. Include a description of queue operations and their significance in programming.
8. Write an Algorithm to implement the following queue operations: enqueue(), dequeue(), front(), and isEmpty().
9. Explain the different types of array implementations and their uses. Discuss the advantages and disadvantages of each type in practical scenarios.
10. Write an Algorithm to perform insert, delete, and display operations using a simple queue.
11. Explain the concept of a stack and its applications. Include a description of stack operations and their significance in programming.

12. Write an Algorithm to perform the stack operations: push(), pop(), peek(), and update().
13. Describe the different types of queues and their uses. Discuss the advantages and disadvantages of each type of queue in practical scenarios.
14. Describe Classification of Data Structure in detail.
15. Differentiate Bottom up and Top down Model.
16. Describe Time complexity and space complexity with best case, worst case and Average Case.
17. Write algorithm of circular queue insert and delete operation.
18. Convert $(a+b-c/(d+e)+f-g)$ expression into postfix using stack
19. What is Big Oh Notation?