Basic DSA-style questions that use only variables, datatypes, and conditional statements in JavaScript

Question: 1
Declare a variable `num` with any value. Use an `if-else` condition to check whether the number is positive, negative, or zero. Print the result (with the help of console.log).

Examples:

- Input: `num = 8`
  Output: `"The number is positive."`
- Input: `num = -5`
  Output: `"The number is negative."`
- Input: `num = 0`
  Output: `"The number is zero."`

Question: 2
Create two variables, `a` and `b`, with different numbers. Write a program that compares them and prints which one is greater.

Examples:

- Input: `a = 12, b = 7`
  Output: `"a is greater than b"`
- Input: `a = 4, b = 15`
  Output: `"b is greater than a"`

Question: 3
Store a temperature value in a variable. Use a conditional statement to print:

- "Hot" if the temperature is above 30,
- "Warm" if it's between 15 and 30,

- "Cold" if it's below 15.

Examples:

- Input: `temperature = 35`
  Output: `"Hot"`
- Input: `temperature = 20`
  Output: `"Warm"`
- Input: `temperature = 10`
  Output: `"Cold"`

For Loop Questions:

1. Print Numbers from 1 to 10

- Use a `for` loop to print the numbers from 1 to 10.

2.Sum of First 10 Natural Numbers

- Use a `for` loop to calculate and print the sum of the first 10 natural numbers (1 to 10).

Examples:

- Sum of numbers from 1 to 10:
  - Output: `"The sum is 55"`

3.**Print Even Numbers from 1 to 20**

- Use a `for` loop to print all even numbers between 1 and 20.

4.**Find the Factorial of a Number**

- Use a `for` loop to calculate the factorial of a given number `n`.

Examples:

- Input: `n = 4`
  Output: `"The factorial of 4 is 24"`
- Input: `n = 6`
  Output: `"The factorial of 6 is 720"`

Functions Questions:

1. Create a function to add two numbers.

Write a function called `addNumbers` that takes two numbers as arguments, adds them, and prints the sum using `console.log`.

Examples:

- Input: `addNumbers(5, 3)`
  Output: `"The sum is 8"`
- Input: `addNumbers(10, 15)`
  Output: `"The sum is 25"`

2. Write a function that multiplies a number by itself.

Define a function `squareNumber` that takes a number as an argument and prints its square using `console.log`.

Examples:

- Input: `squareNumber(4)`
  Output: `"The square of 4 is 16"`
- Input: `squareNumber(7)`
  Output: `"The square of 7 is 49"`

3. Create a function to check if a number is even or odd.

Write a function called `checkEvenOdd` that takes a number as input and prints whether it's even or odd.

Examples:

- Input: `checkEvenOdd(8)`
  Output: `"8 is even"`
- Input: `checkEvenOdd(15)`
  Output: `"15 is odd"`

4. Write a function that prints all numbers from 1 to N.

Define a function `printNumbers` that takes a number N as input and prints all numbers from 1 to N using a loop.

5. Multiply Two Numbers
Write a function called `multiplyNumbers` that takes two arguments, multiplies them, and prints the result using `console.log`.

Examples:

- Input: `multiplyNumbers(6, 4)`
  Output: `"The result is 24"`
- Input: `multiplyNumbers(3, 7)`
  Output: `"The result is 21"`

6. Find the Largest of Two Numbers

Create a function called `findLargest` that takes two numbers as arguments and prints the larger number using `console.log`.

Examples:

- Input: `findLargest(12, 5)`
  Output: `"The larger number is 12"`
- Input: `findLargest(8, 15)`
  Output: `"The larger number is 15"`

7. Function to Calculate Factorial

Create a function called `findFactorial` that takes a number as an argument and prints the factorial of that number.

Examples:

- Input: `findFactorial(4)`
  Output: `"The factorial of 4 is 24"`
- Input: `findFactorial(5)`
  Output: `"The factorial of 5 is 120"`

String Questions:

1.**Concatenate Strings:** Write a function that takes two strings as arguments and prints their concatenation.

Examples:

- Input: `concatenateStrings("Hello", "World")`
  Output: `"HelloWorld"`
- Input: `concatenateStrings("Good", "Morning")`
  Output: `"GoodMorning"`

2.**Count the Number of Characters:** Write a function that accepts a string and counts how many characters (excluding spaces) it contains.

Examples:

- Input: `countCharacters("Hello World")`
  Output: `"Number of characters: 10"`
- Input: `countCharacters("OpenAI rocks")`
  Output: `"Number of characters: 10"`

3.**Check if Two Strings Are Equal:** Write a function that compares two strings and checks if they are equal (case-sensitive comparison).

Examples:

- Input: `checkStringsEqual("Hello", "hello")`
  Output: `"Strings are not equal"`
- Input: `checkStringsEqual("Test", "Test")`
  Output: `"Strings are equal"`

4.**Print Each Character of a String:** Write a function that takes a string and prints each character of the string on a new line.

Break and continue statement

1.Check if a String Contains a Specific Character: Write a function that checks if a string contains a specific character.

Examples:

- Input: `containsCharacter("Hello World", "o")`
  Output: `"Character found"`
- Input: `containsCharacter("JavaScript", "z")`
  Output: `"Character not found"`

2.**Find First Occurrence of a Character (Use `break`):** Write a function that searches for the first occurrence of a specific character in a string and stops the search as soon as the character is found.

Examples:

- Input: `findFirstOccurrence("Hello World", "o")`
  Output: `"First occurrence at index: 4"`
- Input: `findFirstOccurrence("OpenAI", "p")`
  Output: `"First occurrence at index: 1"`

3.**Skip Vowels in a String (Use `continue`):** Write a function that prints all characters of a string except the vowels. Use `continue` to skip the vowels.

Examples:

- Input: `skipVowels("Hello World")`
  Output: `"Hll Wrld"`
- Input: `skipVowels("JavaScript")`
  Output: `"JvScrpt"`

Array Questions:

1.**Sum of All Elements:** Write a function that takes an array of numbers and calculates the sum of all its elements.

Examples:

- Input: `sumOfElements([1, 2, 3, 4, 5])`
  Output: `15`
- Input: `sumOfElements([10, 20, 30])`
  Output: `60`

2.Find Maximum Element: Write a function that finds the maximum number in an array and logs it to the console.

Examples:

- Input: `findMaximum([1, 5, 3, 9, 2])`
  Output: `9`
- Input: `findMaximum([-10, -5, -1, -20])`
  Output: `-1`

3.**Count Odd and Even Numbers:** Write a function that counts how many odd and even numbers are in an array and prints the counts.

Examples:

- Input: `countOddEven([1, 2, 3, 4, 5, 6])`
  Output: `"Odd: 3, Even: 3"`
- Input: `countOddEven([10, 15, 20, 25])`
  Output: `"Odd: 2, Even: 2"`

4.**Reverse the Array:** Write a function that reverses the elements of an array and prints the reversed array.

Examples:

- Input: `reverseArray([1, 2, 3, 4, 5])`
  Output: `[5, 4, 3, 2, 1]`
- Input: `reverseArray(['a', 'b', 'c'])`
  Output: `['c', 'b', 'a']`

5.**Check for Duplicates:** Write a function that checks if an array contains any duplicate elements. Print `true` if duplicates are found, otherwise print `false`.

Examples:

- Input: `checkDuplicates([1, 2, 3, 4, 1])`
  Output: `true`
- Input: `checkDuplicates([5, 6, 7, 8])`
  Output: `false`

6.**Find Element Index:** Write a function that takes an array and a number, then finds and logs the index of that number in the array. If the number is not found, print `-1`.

Examples:

- Input: `findIndex([10, 20, 30, 40], 30)`
  Output: `2`
- Input: `findIndex([1, 2, 3], 5)`
  Output: `-1`

7.**Merge Two Arrays:** Write a function that merges two arrays into one and logs the new array.

Examples:

- Input: `mergeArrays([1, 2], [3, 4])`
  Output: `[1, 2, 3, 4]`
- Input: `mergeArrays(['a', 'b'], ['c', 'd'])`
  Output: `['a', 'b', 'c', 'd']`

8.**Find Minimum Element:** Write a function that finds the minimum number in an array and logs it to the console.

Examples:

- Input: `findMinimum([10, 5, 20, 1])`
  Output: `1`
- Input: `findMinimum([-3, -1, -7, -2])`
  Output: `-7`

9.**Count the Number of Elements:** Write a function that counts the total number of elements in an array and prints the count.

Examples:

- Input: `countElements([1, 2, 3, 4, 5])`
  Output: `5`
- Input: `countElements(['apple', 'banana', 'cherry'])`
  Output: `3`

10.**Find the Average of Elements:** Write a function that calculates and prints the average of the numbers in an array.

Examples:

- Input: `findAverage([10, 20, 30, 40])`
  Output: `25`
- Input: `findAverage([5, 10, 15])`
  Output: `10`

Mock Interview 1

Stack Questions:

Task 1: Create an Empty Stack and Push an Item

- Create an empty stack using an array, push the number `5` onto the stack, and log the updated stack to the console.

Task 2: Pop an Item from the Stack

- Using the stack created in Task 1, pop the top item from the stack and log the popped item as well as the updated stack.

Task 3: Check the Top Item of the Stack

- After Task 2, check what the top item of the stack is without removing it. Log the top item to the console.

Task 4: Check if the Stack is Empty

- Write a condition to check if the stack is empty and log a message indicating whether it is empty or not.

Task 5: Push Multiple Items onto the Stack

- Create an array with numbers `[10, 20, 30]`, then push each of these numbers onto the stack one by one, logging the stack after each push.

Task 6: Pop All Items from the Stack

- Using a loop, pop all items from the stack one by one until it is empty, logging each popped item.

Task 7: Implement a Function to Check if a Stack is Full

- Write a function that checks if the stack has reached its maximum capacity (for this task, consider a maximum capacity of 5 items). Log a message indicating if the stack is full or not.

Queue Questions:

Task: Implement a Circular Queue

Description:
Create a circular queue using an array with a fixed size. Your task is to implement the following operations:

1. **Enqueue:** Add an element to the rear of the queue.
2. **Dequeue:** Remove an element from the front of the queue.
3. **isEmpty:** Check if the queue is empty.
4. **isFull:** Check if the queue is full.

Make sure to handle the circular nature of the queue when adding or removing elements. Use `console.log` to display messages for each operation.