## MERN STACK DEVELOPMENT JULY 2024
## DATA STRUCTURE AND ALGORITHM
## WEEKLY ASSIGNMENT - III

**1) What is an Algorithm?**

A) A step-by-step procedure to solve a specific problem

B) A set of data organized in memory

C) A specific type of loop used in programming

D) A programming language

**ANS :A step-by-step procedure to solve a specific problem**

**2) What is a Data Structure?**

A) A process of executing an algorithm

B) A way of organizing and storing data in memory

C) A machine-level instruction

D) A loop that runs until a condition is met

**Ans B) A way of organizing and storing data in memory**

**3) What is the difference between a linear and a non-linear data structure?**

A) In linear data structures, elements are stored sequentially, whereas in non-linear data structures, they are stored hierarchically.

B) Non-linear structures store data in a linear sequence, while linear structures store data hierarchically.

C) Linear structures are memory-efficient, while non-linear structures are not.

D) There is no difference between the two.

**ANS: A) In linear data structures, elements are stored sequentially, whereas in non-linear data structures, they are stored hierarchically.**

**4)True or False:**

a. An array can store elements of different data types in JavaScript.
TRUE

b. Linked lists can dynamically resize, unlike arrays
TRUE

c. A graph can have cycles, where a node points back to itself or one of its ancestors.
TRUE

d. The pop operation on a queue removes and returns the first element that was added to the queue.
FALSE

**5) What will be the output of the following code snippet?**

```
const numbers = [1, 2, 3, 4];
const sum = numbers.reduce((acc, num) => acc + num, 0);
console.log(sum);
```

A) 10

B) 24

C) 9

D) 4

**ANS A) 10**

**6)Which of the following operations cannot be performed directly on an array in JavaScript?**

A) Access an element using an index

B) Add a new element at the end of the array

C) Remove an element at a specific position without using a built-in method

D) Determine the length of the array

**ANS C) Remove an element at a specific position without using a built-in method**

**7) Find the output**

```
class Stack {
 constructor() {
  this.stack = [];
 }

 push(element) {
  this.stack.push(element);
 }

 pop() {
  return this.stack.pop();
 }

 peek() {
  return this.stack[this.stack.length - 1];
 }
```

```
  isEmpty() {
    return this.stack.length === 0;
  }
}


let myStack = new Stack();
myStack.push(10);
myStack.push(20);
myStack.push(30);
console.log(myStack.pop());  //30
console.log(myStack.peek());  //20
```

## 8) Find the output

```
class Queue {
 constructor() {
   this.queue = [];
 }

 enqueue(element) {
   this.queue.push(element);
 }

 dequeue() {
   return this.queue.shift();
 }

 isEmpty() {
   return this.queue.length === 0;
 }
 peek() {
     if (this.isEmpty()) {
         return "No elements in Queue";
     }
     return this.items[0];
   }

}

let myQueue = new Queue();
myQueue.enqueue(10);
```

```
myQueue.enqueue(20);
myQueue.enqueue(30);
console.log(myQueue.dequeue());  //10
console.log(myQueue.peek());  //20
```

## 9)What will be the output of the following code snippet?

```
const nums = [1, 2, 3, 4, 5];
nums.splice(2, 1, 10, 20);
console.log(nums);
```

A) [1, 2, 10, 20, 4, 5]

B) [1, 2, 10, 20, 3, 4, 5]

C) [1, 2, 3, 10, 20, 4, 5]

D) [1, 2, 10, 20, 5]

**ANS A) [1, 2, 10, 20, 4, 5]**

## 10) What will be the output of the following code snippet?

```
const obj = {
  value: 10,
  getValue: function() {
    return this.value;
  }
};

const getValue = obj.getValue;
console.log(getValue());
```

A) 10

B) undefined

C) TypeError

D) NaN\

//ANS B) undefined