JavaScript Lab Manual

9. a. Create a script that declares variables of various types (string, number, boolean, null, undefined) and prints their types and values to the console.

```
let item_name ='Laptop'
let total = 3
let price = 54500.50
let brand
let flag = 20 > 10
let a = null
console.log('Value of item_name is ' + item_name)
console.log('Type of item_name is ' +  typeof(item_name))
console.log('Value of total is ' + total)
console.log('Type of  total is ' + typeof(total))
console.log('Value of brand is ' + brand)
console.log("Type of brand is " + typeof(brand))
console.log('Value of flag is ' + flag)
console.log('Type of flag is ' + typeof(flag))
console.log('Value of a is ' + a)
console.log('Type of a is ' + typeof(a))
```

b. Write a script to demonstrate the use of arithmetic operators (+, -, *, /, %) and string concatenation.

```
let a = 10
let b = 5
let sum = a + b
let sub = a - b
let p = a * b
let div = a / b
let r = a % b

console.log("Arithmetic operations")
console.log(a + ' + ' +  b + ' = ' + sum)
console.log(a + ' - ' + b + ' = ' + sub)
console.log(a + ' * ' + b + ' = ' + p)
console.log(a + ' / ' + b + ' = ' + div)
console.log(a + ' % ' + b + ' = ' + r)
```

10. a. Write a script that asks the user to enter a number and determines if it is positive, negative, or zero using if-else.

```
<!DOCTYPE html>
<html lang="en">
<head>
  <meta charset="UTF-8">
  <meta name="viewport" content="width=device-width, initial-scale=1.0">
  <title>Document</title>
</head>
<body>
  <script>
    let num = Number(prompt('Enter an integer'))
    if (num > 0) {
      document.write(num + ' is a positive number')
    }
    else if (num < 0) {
      document.write(num + ' is a negative number')
    }
    else {
      document.write(num + ' is zero')
    }
  </script>
</body>
</html>
```

b. Write a script displays the day of the week based on a number input using switch-case.

```
<!DOCTYPE html>
<html lang="en">
<head>
  <meta charset="UTF-8">
  <meta name="viewport" content="width=device-width, initial-scale=1.0">
  <title>Document</title>
</head>
<body>
  <script>
```

```
        let dayno = Number(prompt('Enter day number'))
        document.write('Entered day number is ' + dayno)
        switch(dayno){
          case 1: document.write('It is a Sunday')
                break
          case 2: document.write('It is aMonday')
               break
          case 3: document.write('It is a Tuesday')
               break
          case 4: document.write('It is a Wednesday')
                break
          case 5: document.write('It is a Thursday')
                break
          case 6: document.write('It is a Friday')
                break
          case 7: document.write('It is a Saturday')
                break
          default:document.write('Invalid day number')
        }
      </script>
    </body>
    </html>
```

11. a. Create a script with functions for addition, subtraction, multiplication, and division, then call these functions with user inputs.

```
<!DOCTYPE html>
<html lang="en">
<head>
  <meta charset="UTF-8">
  <meta name="viewport" content="width=device-width, initial-scale=1.0">
  <title>Document</title>
</head>
<body>
  <script>
    function add (n1, n2) {
```

```
    return n1 + n2
  }

  function subtract (n1, n2) {
    return n1 - n2
  }

  function multiply (n1, n2) {
    return n1 * n2
  }

  function division (n1, n2) {
    return n1 / n2
  }

  let a = Number(prompt('Enter a'))
  let b = Number(prompt('Enter b'))
  document.write(a + ' + ' +  b + ' = ' + add(a,b))
  document.write("<br>")
  document.write(a + ' - ' + b + ' = ' + subtract(a,b))
  document.write("<br>")
  document.write(a + ' * ' + b + ' = ' + multiply(a,b))
  document.write("<br>")
  document.write(a + ' / ' + b + ' = ' + division(a,b))
</script>
</body>
</html>
```

b. Write a script to create an object representing a student with properties like name, age, and grade. Modify the object's properties and print them.

```
// Create an object representing a student
let student = {
  name: "Rajesh",
  institution: "JAIN (Deemed-to-be University)",
  programme: "BSc",
  combination: "PMCs",
```

```
    age: 20,
    total: 456,


    // Method to print student details
    printDetails: function() {
        console.log("Student details:");
        console.log("Name:", this.name);
        console.log("Institution:", this.institution);
        console.log("Programme:", this.programme);
        console.log("Combination:", this.combination);
        console.log("Age:", this.age);
        console.log("Total:", this.total);
    },

    // Method to modify student details
    modifyCombination: function (combination) {
        this.combination = combination;
    }
};

// Print the initial properties
console.log("Initial:");
student.printDetails();

// Modify the student's combination using the method
student.modifyCombination("RPCs");

// Modify the student's properties
student.age = 21;

// Print the modified properties
console.log("\nModified:");
student.printDetails();
```

c. Define a constructor function for a Car object with properties like make, model, and year. Create instances of the Car object and print their details.

```
// Constructor function for Car object
function Car(make, model, year) {
  this.make = make;
  this.model = model;
  this.year = year;
}

// Method to display car details
Car.prototype.displayDetails = function() {
  console.log(`Car: ${this.year} ${this.make} ${this.model}`);
};

// Creating instances of Car
let car1 = new Car('Toyota', 'Camry', 2021);
let car2 = new Car('Honda', 'Accord', 2022);
let car3 = new Car('Tesla', 'Model 3', 2023);

// Printing details of each car
car1.displayDetails();
car2.displayDetails();
car3.displayDetails();
```

12. a. Create a script to access and modify elements using methods like `getElementById`, `getElementsByClassName`, and `querySelector`.

```
<!DOCTYPE html>
<html lang="en">
<head>
    <meta charset="UTF-8">
    <meta name="viewport" content="width=device-width, initial-scale=1.0">
    <title>Employee Data Form</title>
    <style>
        .error {
            color: red;
        }
    </style>
</head>
<body>
```

```
    <h2>Employee Data Form</h2>
    <form id="employeeForm">
        <label for="name">Name:</label>
        <input type="text" id="name" name="name">
        <span class="error" id="nameError"></span>
        <br><br>

        <label for="email">Email:</label>
        <input type="email" id="email" name="email">
        <span class="error" id="emailError"></span>
        <br><br>

        <label for="employeeId">Employee ID:</label>
        <input type="text" id="employeeId" name="employeeId">
        <span class="error" id="employeeIdError"></span>
        <br><br>

        <label for="department">Department:</label>
        <input type="text" id="department" name="department">
        <span class="error" id="departmentError"></span>
        <br><br>

        <button type="submit">Submit</button>
    </form>

    <script>
        document.getElementById('employeeForm').addEventListener('submit',
function(event) {
            // Prevent form submission
            event.preventDefault();

            // Clear previous errors
            document.getElementById('nameError').textContent = '';
            document.getElementById('emailError').textContent = '';
            document.getElementById('employeeIdError').textContent = '';
            document.getElementById('departmentError').textContent = '';

            // Validate form inputs
            let valid = true;

            // Name validation
            const name = document.getElementById('name').value;
            if (name === '') {
                  document.getElementById('nameError').textContent = 'Name is
             required.';
```

```
            valid = false;
        }

        // Email validation
        const email = document.getElementById('email').value;
        const emailPattern = /^[^ ]+@[^ ]+\.[a-z]{2,3}$/;
        if (email === '') {
            document.getElementById('emailError').textContent = 'Email is
        required.';
            valid = false;
        } else if (!email.match(emailPattern)) {
            document.getElementById('emailError').textContent = 'Enter a
            valid email address.';
            valid = false;
        }

        // Employee ID validation
        const employeeId = document.getElementById('employeeId').value;
        if (employeeId === '') {
            document.getElementById('employeeIdError').textContent =
            'Employee ID is required.';
            valid = false;
        } else if (!/^\d+$/.test(employeeId)) {
            document.getElementById('employeeIdError').textContent =
            'Employee ID must be numeric.';
            valid = false;
        }

        // Department validation
        const department = document.getElementById('department').value;
        if (department === '') {
            document.getElementById('departmentError').textContent =
            'Department is required.';
            valid = false;
        }

        // If the form is valid, submit it
        if (valid) {
            alert('Form submitted successfully!');
            // Uncomment the next line to actually submit the form
            // document.getElementById('employeeForm').submit();
        }
    });
</script>
</body>
```

```
</html>
```

b. Create a dynamic web page where clicking a button changes the content of a `<div>` element.

12b.html

```
<!DOCTYPE html>
<html lang="en">
<head>
    <meta charset="UTF-8">
    <meta http-equiv="X-UA-Compatible" content="IE=edge">
    <meta name="viewport" content="width=device-width, initial-scale=1.0">
    <title>Dynamic Content Update</title>

</head>
<body>
    <h1>Dynamic Content Update</h1>
    <div id="content">This is the original content of the div.</div>
    <br>
    <button id="changeContentBtn">Change Content</button>

    <script src="script.js"></script>
</body>
</html>
```

script.js

```
document.getElementById('changeContentBtn').addEventListener('click', function()
{
    const contentDiv = document.getElementById('content');
    contentDiv.textContent = 'The content has been changed!';
});
```

13. Create an HTML form and use JavaScript to validate the form inputs before submission.

```
<!DOCTYPE html>
<html lang="en">
<head>
    <meta charset="UTF-8">
```

```
    <meta name="viewport" content="width=device-width, initial-scale=1.0">
    <title>Employee Data Form</title>
    <style>
        .error {
            color: red;
        }
    </style>
</head>
<body>
    <h2>Employee Data Form</h2>
    <form id="employeeForm">
        <label for="name">Name:</label>
        <input type="text" id="name" name="name">
        <span class="error" id="nameError"></span>
        <br><br>

        <label for="email">Email:</label>
        <input type="email" id="email" name="email">
        <span class="error" id="emailError"></span>
        <br><br>

        <label for="employeeId">Employee ID:</label>
        <input type="text" id="employeeId" name="employeeId">
        <span class="error" id="employeeIdError"></span>
        <br><br>

        <label for="department">Department:</label>
        <input type="text" id="department" name="department">
        <span class="error" id="departmentError"></span>
        <br><br>

        <button type="submit">Submit</button>
    </form>

    <script>
        document.getElementById('employeeForm').addEventListener('submit',
function(event) {
            // Prevent form submission
            event.preventDefault();

            // Clear previous errors
            document.getElementById('nameError').textContent = '';
            document.getElementById('emailError').textContent = '';
            document.getElementById('employeeIdError').textContent = '';
            document.getElementById('departmentError').textContent = '';
```

```
// Validate form inputs
let valid = true;

// Name validation
const name = document.getElementById('name').value;
if (name === '') {
      document.getElementById('nameError').textContent = 'Name is
 required.';
    valid = false;
}

// Email validation
const email = document.getElementById('email').value;
const emailPattern = /^[^ ]+@[^ ]+\.[a-z]{2,3}$/;
if (email === '') {
        document.getElementById('emailError').textContent = 'Email is
 required.';
    valid = false;
} else if (!email.match(emailPattern)) {
         document.getElementById('emailError').textContent = 'Enter a
       valid email address.';
    valid = false;
}

// Employee ID validation
const employeeId = document.getElementById('employeeId').value;
if (employeeId === '') {
       document.getElementById('employeeIdError').textContent =
       'Employee ID is required.';
    valid = false;
} else if (!/^\d+$/.test(employeeId)) {
       document.getElementById('employeeIdError').textContent =
       'Employee ID must be numeric.';
    valid = false;
}

// Department validation
const department = document.getElementById('department').value;
if (department === '') {
       document.getElementById('departmentError').textContent =
       'Department is required.';
    valid = false;
}
```

```
            // If the form is valid, submit it
            if (valid) {
                alert('Form submitted successfully!');
                // Uncomment the next line to actually submit the form
                // document.getElementById('employeeForm').submit();
            }
        });
    </script>
</body>
</html>
```