Q1. What is the DOM (Document Object Model) in JavaScript? How does JavaScript interact with the DOM?

Ans: The DOM (Document Object Model) is a programming interface that represents an HTML document as a tree-like structure. In the DOM, every HTML element, attribute, and text becomes an object that JavaScript can access and manipulate.

Simply put, the DOM allows JavaScript to connect with and control HTML and CSS.

How JavaScript Interacts with the DOM

JavaScript interacts with the DOM by selecting, modifying, adding, or removing elements on a webpage.

1. Accessing DOM Elements

JavaScript can select HTML elements using methods like:

document.getElementById("title");

document.getElementsByClassName("box");

document.querySelector(".container");

2. Modifying Content

JavaScript can change the content of HTML elements:

document.getElementById("title").innerText = "Welcome!";

3. Changing Styles

JavaScript can modify CSS styles dynamically:

document.getElementById("title").style.color = "red";

4. Handling Events

JavaScript can respond to user actions using event listeners:

document.getElementById("btn").addEventListener("click", function () {

  alert("Button clicked");

});

5. Creating and Removing Elements

JavaScript can create new elements and add them to the page:

let p = document.createElement("p");

p.innerText = "New paragraph";

document.body.appendChild(p);

Q2. Explain the methods getElementById(), getElementsByClassName(),and querySelector() used to select elements from the DOM.

Ans: JavaScript provides several methods to select elements from the DOM. The most commonly used are getElementById(), getElementsByClassName(), and querySelector().

1. getElementById()

- Selects one element using its unique id.

- Returns a single element object.

Syntax:

document.getElementById("idName");

Example:

<p id="text">Hello World</p>

<script>

  let para = document.getElementById("text");

  para.style.color = "blue";

</script>

2. getElementsByClassName()

- Selects all elements with a specific class name.

- Returns an HTMLCollection (array-like object).

- Elements are accessed using index numbers.

Syntax:

document.getElementsByClassName("className");

Example:

<p class="box">One</p>

<p class="box">Two</p>

```
<script>
  let items = document.getElementsByClassName("box");
  items[0].style.color = "red";
</script>
```

3. querySelector()

- Selects the first element that matches a CSS selector.
- Supports id, class, tag, and complex CSS selectors.

Syntax:

```
document.querySelector("selector");
```

Example:

```
<h1 class="title">Heading</h1>


<script>
  let heading = document.querySelector(".title");
  heading.style.fontSize = "30px";
</script>
```