Below is a **clean, structured, exam-ready, and conceptually strong rewrite** of your content on **JavaScript DOM Methods & Properties**.
I've **removed duplication**, **grouped logically**, **clarified internals**, and **kept everything syllabus-aligned** for **college exams + real-world usage**.

📘 JavaScript DOM Methods & Properties

In JavaScript, **DOM methods** are used to **perform actions on HTML elements**, while **DOM properties** are used to **get or set information** about those elements.

The **DOM (Document Object Model)** represents an HTML document as a **logical tree structure**:

- Each element → **node**
- Each node → object
- JavaScript accesses this tree using **DOM APIs**

Using DOM methods and properties, JavaScript can dynamically:

- Change structure
- Modify content
- Update styles
- Attach events

🌳 DOM Tree Recap (Conceptual)

```
css

Document
└── html
    └── body
        ├── h1
        ├── p
        └── div
```

DOM methods allow **programmatic access** to this tree.

🧩 General Syntax of DOM Methods

```
js

document.methodName();
window.document.methodName();
```

📌 `window` is optional because it is the **global object** in browsers.

🔹 Important DOM METHODS

DOM methods can be broadly grouped into **4 categories**:

1. **Element Selection**
2. **DOM Manipulation**
3. **Event Handling**
4. **Node & Structure Operations**

1️⃣ Element Selection Methods

Used to **locate HTML elements** in the DOM.

▶ `document.getElementById()`

Accesses a **single element** by its unique ID.

```
js

const el = document.getElementById("output");
```

✔️ Fast
✔️ Most commonly used
✔️ Returns `null` if ID not found

▶ `getElementsByClassName()`

Returns a **live HTMLCollection**.

```
js

document.getElementsByClassName("box");
```

▶ `getElementsByTagName()`

Selects elements by tag name.

```
js

document.getElementsByTagName("p");
```

▶ `querySelector()`

Returns **first matching element** (CSS selector).

```
js

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

▶ `querySelectorAll()`

Returns a **static NodeList** of all matches.

```js
document.querySelectorAll("div.active");
```

2️⃣ DOM Manipulation Methods

Used to **add, remove, replace, or modify elements**.

▸ Creating Nodes

```js
document.createElement("div");
document.createTextNode("Hello");
document.createComment("comment");
document.createDocumentFragment();
```

▸ Adding Nodes

```js
parent.appendChild(child);
parent.insertBefore(newNode, referenceNode);
element.insertAdjacentElement(position, element);
element.insertAdjacentHTML(position, html);
element.insertAdjacentText(position, text);
```

Positions:

- `"beforebegin"`
- `"afterbegin"`
- `"beforeend"`
- `"afterend"`

▸ Removing / Replacing

```js
element.remove();
parent.removeChild(child);
parent.replaceChild(newChild, oldChild);
```

▸ Cloning

```js
```

```
node.cloneNode(true); // deep clone
```

3️⃣ Event Handling Methods

▶ `addEventListener()`

Registers an event handler.

```
js

element.addEventListener("click", handler);
```

▶ `removeEventListener()`

Removes a previously attached event.

▶ `click()`

Programmatically triggers a click.

▶ `focus()` / `blur()`

Manages focus state.

4️⃣ Node & Structural Methods

Method	Purpose
`contains()`	Checks subtree containment
`closest()`	Finds nearest ancestor
`matches()`	Matches CSS selector
`hasChildNodes()`	Checks children
`normalize()`	Merges adjacent text nodes
`compareDocumentPosition()`	Compares node positions
`isSameNode()`	Reference equality
`isEqualNode()`	Structural equality

⚠️ Special / Deprecated Methods (Know for Exams)

- `document.write()` / `writeln()`
- `execCommand()` (deprecated)

- `isSupported()` (obsolete)
- `domConfig` (deprecated)

📌 **Avoid in modern applications**, but **may appear in theory questions**.

🔹 DOM PROPERTIES

DOM properties are used to **get or set values** of elements.

1️⃣ Content Properties

Property	Description
`innerHTML`	Read/write HTML
`outerHTML`	Full element HTML
`innerText`	Visible text only
`textContent`	Raw text (recommended)

2️⃣ Attribute & Identity Properties

Property	Purpose
`id`	Element ID
`className`	Class attribute
`classList`	Add/remove classes
`name`	Name attribute
`value`	Input value
`checked`	Checkbox/radio state
`disabled`	Enable/disable

3️⃣ Tree Navigation Properties

Property	Description
`parentNode`	Immediate parent
`parentElement`	Parent element
`children`	Element children

Property	Description
`childNodes`	All child nodes
`firstChild`	First node
`firstElementChild`	First element
`lastChild`	Last node
`lastElementChild`	Last element
`nextSibling`	Next node
`nextElementSibling`	Next element

4️⃣ Layout & Size Properties

Property	Meaning
`offsetWidth / offsetHeight`	Visible size
`clientWidth / clientHeight`	Inner size
`scrollWidth / scrollHeight`	Scrollable size
`scrollTop / scrollLeft`	Scroll position
`getBoundingClientRect()`	Position & size

5️⃣ Document-Level Properties

Property	Purpose
`title`	Page title
`URL`	Full document URL
`domain`	Domain name
`cookie`	Cookies
`forms`	All forms
`images`	All images

Property	Purpose
`links`	All links
`scripts`	Script elements
`documentElement`	`<html>`
`body`	`<body>`
`head`	`<head>`
`lastModified`	Last update time

6️⃣ Editability & Interaction

Property	Description
`contentEditable`	Editable content
`designMode`	Editable document
`tabIndex`	Tab navigation
`accessKey`	Keyboard shortcut
`hasFocus()`	Focus check

🧠 DOMTokenList (classList)

```js
element.classList.add("active");
element.classList.remove("hidden");
element.classList.toggle("open");
element.classList.contains("dark");
```

🎯 Final Exam-Ready Summary

- **DOM methods** → perform actions
- **DOM properties** → get/set data
- DOM represents HTML as a **tree of nodes**
- JavaScript modifies the page **only through DOM**
- `querySelector()` + `addEventListener()` are modern standards
- Avoid deprecated APIs in real projects

If you want next, I can give you:

- 📌 **DOM Methods vs Properties (1-page chart)**
- 📌 **Most important DOM methods for interviews**
- 📌 **MCQs + viva answers**
- 📌 **DOM manipulation mini-projects**
- 📌 **Performance best practices (reflow & repaint)**

Just tell me 👍