Chapter # 8
Web Development With HTML, CSS & Javascript

Student Learning Outcomes

By the end of this chapter, you will be able to:

- Understand JavaScript syntax and data types.
- Work with variables, operators, and functions in JavaScript.
- Handle events and user input with JavaScript.
- Create simple programs using JavaScript.
- Create HTML forms and style them.
- Use JavaScript to handle events with operators, variables, and functions.
- Develop static web pages.
- Apply HTML tags appropriately to create web pages.
- Create a basic HTML page.
- Add text, images, and links to a page.
- Create lists and tables.
- Apply styles to HTML elements.
- Work with fonts, colors, and backgrounds.
- Create web pages to display data in the paragraphs and lists.
- Familiarize students with CSS syntax.
- Create layouts with CSS.
- Add animations and transitions with CSS.
- Develop, test, and debug static web pages.
- Organize images and text effectively.
- Use JavaScript along with HTML to handle events using operators, variables, and functions.

Subject Questions & Answers

8.1 Web Development

Q.1: What is web development and why we need to learn about it?

Ans. Web Development:

Process of creating websites and web applications is called Web development. It means using various programming languages and tools to design, build, and maintain websites.

Why Learn Web Development?

Web development is a valuable skill for several reasons:

- **Digital Literacy:** When you learn web development, you find out how websites are made. You learn about HTML, which is like the skeleton of a webpage, CSS, which makes the web page look nice, and JavaScript, which makes the web page interactive. This helps you understand how the internet works.
- **Career Opportunities:** Opens up a wide range of job prospects in the growing IT industry. Web developers can get many different kinds of jobs. You can become a web developer, web designer, and more. Many companies need web developers to create and maintain their websites. This means you can find good jobs in many places
- **Problem-Solving:** When you build a website, you solve many problems. For example, if a website is slow, you figure out why and fix it. This helps you think logically and solve problems better.
- **Creativity:** Allows you to create visually appealing and interactive websites. Web development lets you be creative. You can design websites with cool layouts, colors, and interactive features. For example, you can create a personal blog or a portfolio to show your artwork, making your own unique website.
- **Entrepreneurship:** With web development skills, you can start your own online business. For example, if you make crafts, you can build a website to sell them. Or,you can create a new web service, like a fun app, and share it with the world.

8.2 Basic Components of Web Development

Q.2: What are essential components of web development?. Describe briefly.

Ans. Basic Components of Web Development:

Web development involves creating websites and web applications. It has three main components:

1. Front-end Development:

This focuses on what users see and interact with on a website. The following fundamentals are used to design interactive. Front-ends

- **HTML** structures the content on web pages, like headings, paragraphs, images, and links.
- **CSS** styles the content on web pages, changing colors, fonts, and layout to enhance the appearance.
- **JavaScript** adds interactivity to web pages, making them dynamic and engaging. *It* allows features such as forms, animations, and games.

2. Back-end Development:

This manages the behind-the-scenes functionality of a website, including servers, databases, and application logic. Key back-end technologies are:

- **Web Servers** are computers that store and deliver web pages to users when they enter a URL.

- **Databases** store and manage data, like user information, product details, and website content.
- **Back-end** Programming Languages like PHP, Python, and Ruby handle tasks such as processing forms, and managing user logins.

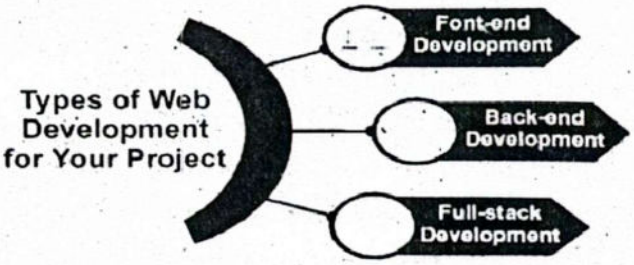


Figure 8.1: Types of Web Development

Example: Login System:

A login system is a common feature in web development, allowing users to access their accounts on a website. This example will illustrate the roles of front-end and back-end development, as well as the concept of full-stack development.

3. Full-Stack Development:

In the case of login system, a full-stack developer will create the User Interface(UI) for front-end and handle user authentication and database interaction for back-end.

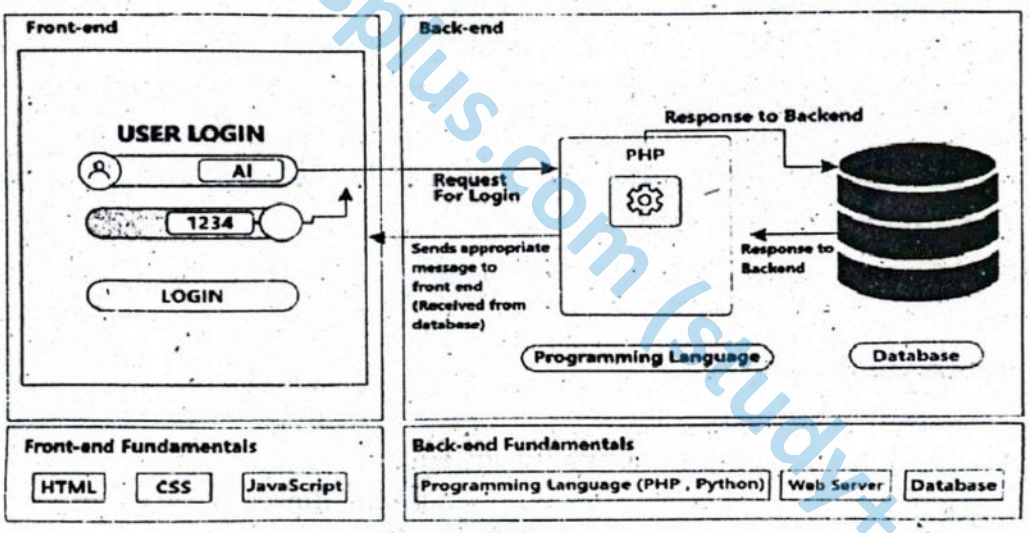


Figure 8.2: Graphical abstract of login system

8.3 Getting Started with HTML

Q.3: Explain the following term:

(a) History of HTML:

(b) Write a code to display "Hello World!" using HTML application.

Ans. Getting Started with HTML:

HTML is the standard language used to create web pages. Think of HTML as the building blocks of a website. Just like LEGO pieces come together to build a structure, HTML tags come together to build a web page.

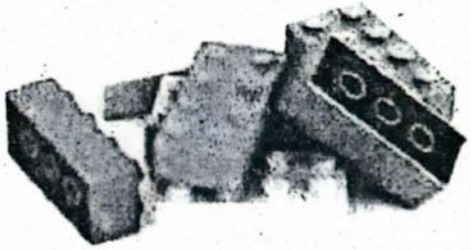


Figure 8.3 LEGO Pieces

History of HTML:

HTML was created by Tim Berners-Lee in 1991. It was designed to make sharing of information on the internet easy. Over the years, HTML has gone through many changes and improvements to make it more powerful and easier to use.

HTML 1.0 (1991):The very first version of HTML. It was simple and had basic features to create text and links.

- **HTML 2.0 (1995):** Introduced more tags and features, allowing for creating more complex web pages.
- **HTML 3.2 (1997):** Added new tags for creating tables, scripts, and applets.
- **HTML 4.0 (1997):** Brought major improvements, including support for multimedia elements like images and videos.
- **HTML 4.01 (1999):** Minor improvements in version 4.0.
- **HTML5 (2014):** The latest version of HTML. It includes new elements forbetter multimedia support, graphics, and more interactive web pages.

Setting up a Development Environment:

To start creating websites, you need a few basic tools and environments:

Text Editor: This is where you write your HTML code. Popular text editors include Notepad++,Sublime Text, and Visual Studio Code.

Web Browser: You will use this to view and test your HTML files. Common web browsers are Google Chrome, Mozilla Firefox, and Microsoft Edge .Start with a simple text editor and a web browser. Once you are comfortable with HTML, you can explore more advanced tools.

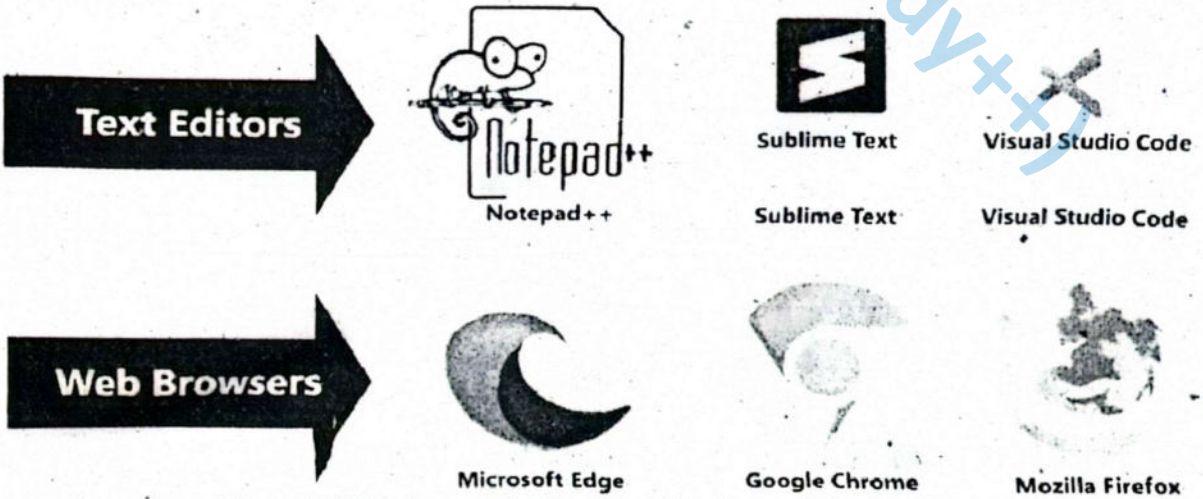


Figure 8.4: Fundamentals of website development environment

Creating a "Hello, World!" HTML Application:

To create a basic HTML application that displays "a message" on a web page,follow these simple steps:

Writing the HTML Code:

1. Open your text editor, You can use Notepad, Notepad++, Sublime Text, orany other text editor.
2. Write the following HTML code into your text editor.
3. Save your file with a html extension, for example,My_first_website.html.

HTML Code Example

```
<!DOCTYPE html>
<html>
    <head>
        <title>My  First Web Page</title>
    </head>
    <body>
      <h1>Welcome to My Website</h1>
      <p>This is my first web page. I am learning HTML in the 9th<p>class!</p>
</body>
</html>
```

Viewing the HTML File:

1. Open Your Web browser (Google Chrome, Mozilla Firefox, and others).
2. Double-click on your file named My_first_website.html.
3. You should see the text welcome to my website displayed on the web page.

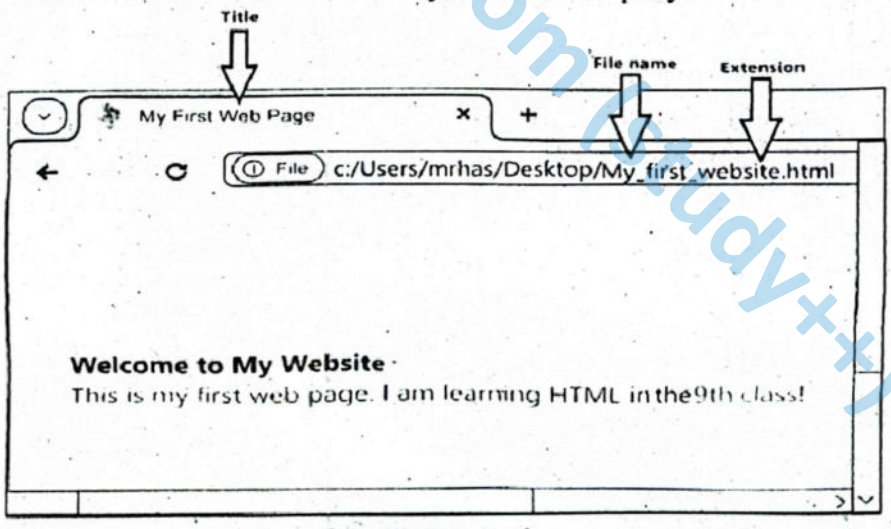


Figure 8.5: HTML in Web Browser

8.4 HTML Basic Structure

Q4: Explain the basic structure of an HTML document. Describe the purpose of different tags used in the structure with examples.

Ans. A structured HTML document is easier to read and understand. Properly nested and

well-organized elements help developers and browsers interpret the content correctly. This organization ensures that the web page displays as intended.

Every HTML document has a basic structure that includes the following components:

1. **<!DOCTYPE html>:**
   This line tells the browser that the document is an HTML5 document.
2. **<html>:**
   It is the root element of an HTML page that contains all other elements.
3. **<head>:**
   This section contains meta-information about the HTML document, such as the title.
4. **<title>:**
   It sets the title of the web page, which appears in the browser tab.
5. **<body>:**
   This section contains the actual content of the web page that is displayed in the browser.
6. **<h1>:**
   It defines a large heading in the document.
7. ** :**
   It defines a paragraph in the document.

Additionally, HTML elements are categorized into two types:

1. **Paired Tags:** These come in pairs, including both an opening tag and a closing tag, such as ... .
2. **Unpaired Tags:** These do not need closing tags and are also known as self-closing tags, such as <img> and <br>.

8.5 Creating Content with HTML

Q.5: What are basic features of creating Content with HTML? Explain with examples.

Ans. Creating Content with HTML:

Content in HTML is the main information on a web page that users read and interact with. It includes text, images, videos, links, and other elements that convey the purpose and message of the page. This makes it easier for people to find your site.

Headings:

Headings in HTML, ranging from <h1> to <h6>, are used to define the structure and hierarchy of content on a web page. Here's why they are important:

Importance of Headings:

1. **Organizing Content Headings:** helps organize the content into sections and subsections, making it easier for users to read and understand. <h1> is typically used for the main title of the page, while <h2>to <h6> are used for subheadings in decreasing order of importance.

2. **Search Engine Optimization (SEO):** Search engines use headings to understand the structure and main topics of a web page. Proper use of headings can improve the page's SEO, helping it rank higher in search results.

3. **Consistent Formatting:** Using standard heading tags ensures consistent formatting across different browsers and devices.

Example: Here is an example of how different heading levels can be used to organizecontent in a hierarchical structure:

```
<!DOCTYPE html>
<html>
    <head>
        <title>Importance of Headings in HTML</title>
    </head>
<body>
            <h1>Main Title (h1)</h1>
            <p>This is the main title of the page.</p>
            <h2>Subheading 1(h2)</h2>
            <p>This is a subheading under the main title.</p>
            <h3>Subheading 2 (h3)</h3>
            </p> This is a subheading under Subheading 1.</p>
  </body>
</html>
```

Paragraphs:

Paragraphs in HTML are used to organize and separate text into readable sections. Each paragraph creates a block of text with space above and below it, making the content easier to read. Paragraphs starts with the <p> tag and it ends with <\p>

Links:

Links in HTML are used to connect one web page to another. They allow you to click on words or images to go to different parts of the same web page or to other web pages on the internet. Links are created using the

<a>tag.<ahref="https://www.example.com">VisitExample.com

Send Email

Sometimes, links in HTML can also let you click to send an email. These special links start with mailto: and when you click them, they open your email program so you can send a message to the email address in the link.

Images:

Images are important in HTML because they make web pages more attractive and engaging. Additionally, using images helps with branding, as logos and specific visuals make it easier for users to recognize a brand. Lastly, including alternate text for images ensures that visually impaired users can understand what the images represent. Images are added using the <img> tag.<img src="image . jpg " alt= "A description II of the I___I image ">"

Lists:

Lists improve readability by breaking complex ideas into simpler parts, allowing users to scan for details easily. Overall, lists make the content more organized and accessible for everyone. You can create ordered (numbered) and unordered(bulleted) lists.

Unordered List:

```
<ul>
    <li>Item 1</li>
    <li>Item 2/li>
    <li>Item 3</li>
<\ul>
```

Ordered List:

```
<ol>
    <li>First item</li>
    <li>Second item</li>
    <li>3rd item</li>
</ol>
```

Creating Tables in HTML:

Tables in HTML are used to display data in a structured format, allowing for easy comparison and organization of information. A table is created using the<table> tag, which contains rows defined by <tr> (table row) tags, and each row consists of cells represented by <td> (table data) tags. Additionally, headings for the table can be added using <th> (table header) tags to provide context for thedata.

Example:

```
<table>
    <tr>
        <th>Name</th>
        <th>Age</th>
    </tr>
    <tr>
        <td>Alice</td>
        <td>14</td>
    </tr>
    <tr>
        <td>Bob</td>
        <td>15</td>
    </tr>
</table>
```

HTML Comments:

In HTML, comments can be extremely useful for:

Explaining the purpose of a specific section of code
Leaving reminders for future edits
Temporarily disabling code for testing purposes
Syntax of HTML Comments;

HTML comments begin with <!-- and end with -->. Any text placed within these markers will be treated as a comment and will not be rendered by the browser.<!--This is a comment-->

8.6 Styling with CSS

Q.7: Briefly describe how you integrate CSS into Html and styling the html elements?

Ans: Styling with CSS:

Styling with Cascading Style Sheets (CSS) is very important for improving the visual appearance of webpages and improving user experience.CSS allows web developers to control the colors, fonts, layout, and overall design of HTML elements, separating the content from the presentation. CSS offers various properties and selectors to apply styles to specific elements, enabling responsive design that automatically adjusts to different screen sizes and devices.

Basic Structure of CSS:

The basic structure of CSS is essential for applying styles to HTML elementseffectively.CSS is composed of rules that consist of selectors and declarations. Selectors specify which HTML elements the styles will apply to, while declarations define the specific styles to be applied, including properties and their corresponding values. A typical CSS rule follows this format:

```
selector{property: value;
        }
```

For example, a simple CSS rule can changes the color and size of all headings on a webpage:

```
h1{
color:red;
font-size:24px;
}
```

In this example, the CSS rule targets all'<h1>' elements, setting their text color to red and font size to 24 pixels.

Integrating CSS in HTML:

Integrating CSS with HTML is essential for styling web pages and it can be done in three primary ways: inline, internal, and external styles.

1. **Inline Styles:** This method involves adding CSS directly to individual HTML elements using the style attribute. For example, <h1 style="color: blue;">Hello World</h1> changes the color of the heading to blue. While easy for quick changes, inline styles can make the code cluttered and less maintainable.

2. **Internal Styles:** CSS can also be included in the <head> section of an HTML document using the <style> tag. This method allows you to define styles for the entire page without affecting others.

For instance:

```
<style>h1{
color: yellow;
}
</style>
```

3. **External Styles:** The most efficient method for larger projects is to use an external CSS file, which is linked to the HTML document with the <link> tag in the<head> section. This keeps the HTML clean and allows for easy updates across multiple pages.

For example:

```
<link rel="stylesheet" href="styles.css">
```

By integrating CSS in these ways, developers can create visually appealing and well-organized web pages that enhance user experience.

Styling HTML Elements with Fonts, Colors, Backgrounds Styling Fonts:

You can change the appearance of text on a web page using CSS. This includes changing the font family, size, weight, and style.

Example of Styling Fonts:

Here is how you can style the font of a paragraph:

```
P{
font-family:Arial,sans-serif;
font-size:16px;
font-weight:bold;
font-style:italic;
}
```

In this example:

font-family: Arial, sans-serif; sets the font to Arial. If Arial is not available, it will use a generic sans-serif font.

font-size: 16px;sets the font size to 16 pixels.

font-weight: bold; makes the text bold.

font-style: italic; makes the text italic.

Q8. What are animations and transitions in CSS? How do they enhance the user experience of a webpage?

Ans. Animations and transitions in CSS enhance user experience by adding visual effects and movement to webpage elements.

CSS Animations:

Animations allow changes in element properties (like color, position, size) over time.

1. **Defining Keyframes:** Specifies the start, end, and intermediate points of an animation. Example:

```
@keyframes example {
  from {background-color: red;}
  to {background-color: yellow;}
}
```

This animation changes the background from red to yellow.

2. **Applying the Animation:** Attaching animation to an element. Example:

```
.animated-box {
  background-color: red;
  animation-name: example;
  animation-duration: 4s;
}
```

This makes the background transition from red to yellow over four seconds.

3. **Loop and Timing:** Repeats animation multiple times with a specific timing function. **Example:**

```
.animated-box {
  animation-iteration-count: infinite;
  animation-timing-function: linear;
}
```

This ensures the animation runs continuously at a constant speed.

CSS Transitions:

Transitions make changes (e.g., size, color, position) smooth instead of instant.

1. **Setting Initial Style: Example:**

```
.box {
  width: 100px;
  height: 100px;
  background-color: red;
  transition: background-color 2s, width 2s;
}
```

This ensures a gradual color and width change over two seconds.

2. **Hover Effect:** Changing properties when the user hovers over an element. Example:

```
.box:hover {
  background-color: yellow;
  width: 200px;
}
```

This doubles the width and changes the color to yellow when hovered.

Animations and transitions make webpages visually appealing and interactive, improving user engagement.

Q.9: How can you change the background of a webpage using CSS? Explain different background properties with examples.

Ans. CSS provides various properties to style the background of a webpage:

1. **Background Color:** You can change the background color of a webpage using the background-color property.

   body { background-color: blue; }

   This sets the background color of the page to blue.

2. **Background Image:** You can set an image as the background using the background-image property.

   body { background-image: url("your-image.jpg"); }

   This sets "your-image.jpg" as the background image.

3. **Background Repeat:** If the image is small and needs to be repeated across the page, use background-repeat.

   body { background-image: url("your-image.jpg"); background-repeat: repeat: }

   This will repeat the background image.

4. **Background Position:** You can position the background image exactly where you want it.

   body { background-image: url("your-image.jpg"); background-position: center; }

   This places the image in the center.

5. **Background Size:** You can control the size of the background image using background-size.

   body { background-size: cover; }

   This ensures the image covers the entire background of the webpage.

   By using these CSS properties, developers can create visually appealing backgrounds to enhance the user experience.

Q10. Explain the importance of the CSS Grid and Flexbox layout techniques in modern web design. How do they differ from each other?

Ans. CSS Grid and Flexbox are modern layout techniques used to create responsive and flexible web designs.

CSS Grid:

A two-dimensional layout system (works with both rows and columns).

Ideal for designing complete webpage layouts.

Example:

```
.container {
  display: grid;
  grid-template-columns: auto auto;
  gap: 10px;
}
.item {
  padding: 20px;
  background-color: lightgrey;
}
```

This divides the container into two columns.

Flexbox:

A one-dimensional layout system (works with either a row or column).

Useful for aligning items dynamically.

Example:

```
.container {
  display: flex;
  justify-content: space-between;
}
.item {
  padding: 20px;
  background-color: lightgrey;
}
```

This distributes items evenly across a row.

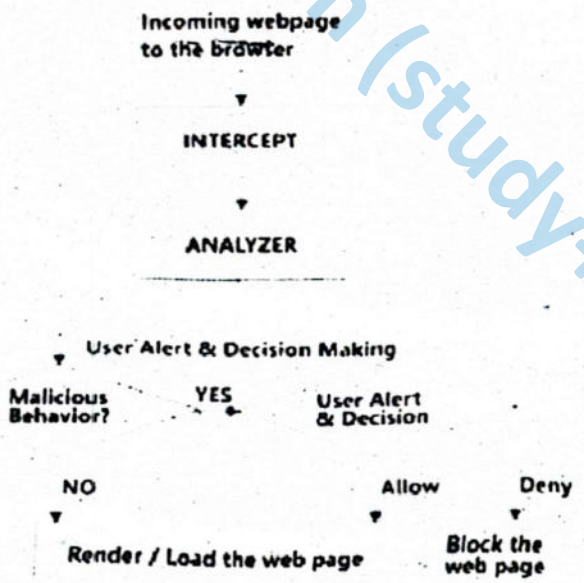
Differences: Both techniques improve webpage responsiveness, but CSS Grid is ideal for complete layouts, while Flexbox is best for flexible element alignment.

8.7 Introduction to JavaScript

Q.11: What is JavaScript? explain its syntax with example.

Ans. *Introduction to Java Script:*

JavaScript is a programming language that is used to make websites interactive and engaging. It allows developers to create things like animations, games, and responsive features that react when you click buttons or move your mouse. For example, when you see a pop-up message on a web page or when an image changes when you over it, that's JavaScript at work.



Execution of JavaScript in a flowchart:

Basic Syntax and Example: Here is a simple example to display an alert message using

JavaScript:

```
<!DOCTYPEhtml>
<html>
    <head>
    <title>JavaScriptExample</title>
    </head>
<body>
    <h1>Welcome to JavaScript</h1>
    <script>
    alert("Hello,9th Class Students!");
    </script>
<body>
<html>
```

Q.12: Explain the following terms of JavaScript:

1. Variables 2. Declaring a variable 3. Data types

Ans. Variables and Data Types :

In JavaScript, you can store data using variables. A variable is like a container that holds information which can be used and manipulated in your code.

Declaring Variables:

To declare a variable in JavaScript, you use the var, let, or const keyword. Here's an example using var:

```
<script>var name = "Athar";
var age=15;
alert("Name:"+name+","Age:"+age);
</script>
```

Dry Run Example:

Let's dry-run the above script to understand how it works step-by-step:

1. Declare variables: name = "Athar"; and age =15;
2. Display alert: alert("Name:" + name +",Age:"+age);

This will result in an alert box showing: Name: Athar, Age: 15.

Data Types:

Variables can store different types of data. Here are some common data types in JavaScript:

String: A sequence of characters used for text.

varname="Athar"://String

Number:

Represents both integer and floating-point numbers.

var age=15;//Number

Boolean:

Represents true or false values.

varisStudent=true://Boolean

Array: A collection of values stored in a single variable. var scores=[90,85,88]://Array

Q.13: Define Function and explain their types in JavaScript?

Ans. Functions in Java Script:

Functions allow you to reuse code and perform specific tasks. They are like mini-programs that you can run whenever you need them. Let's learn how to create and use functions in JavaScript

Simple Function:

Here's an example of a simple function that displays a greeting message:

```
<script>
function greet(){
alert("Hello,Student!"):
}
greetO://This calls the function to execute
</script>
```

In this example:

- The function greet( ) declares a function named greet.
- alert("Hello, Student!"): is the code that runs when the function is called.
- greet();calls the function, displaying the alert message.

Function with Parameters:

Sometimes, you want your function to do something with input values. You can achieve this using parameters

Function with Multiple Parameters:

You can also create functions that take multiple parameters. Here's an example:

```
<script>
function add Numbers(a.b){
var sum=a+b:
alert("The sum is:"+sum):
}
add Numbers(5.3)://This calls the function with the parameters 5 and 3
</script>
```

In this example:

The function add Numbers(a, b) declares a function that takes two parameters, a and b.

var sum = a + b; calculates the sum of a and b.

alert('The sum is:' + sum); displays the result of the addition.

add Numbers(5, 3); calls the function with the arguments 5 and 3, resulting inthe alert message "The sum is:8".

8.7.3 Handling Events and User Input

Q.14: How do you handle events and user inputs in JavaScript. Elaborate with example.

Ans. Handling Events and User Input:

Java Script allows you to make your web page interactive by handling events and user input. An event is an action that occurs when a user interacts with a webpage. like clicking a button or pressing a key.

HTML Events:

HTML events are actions that occur in the browser, often triggered by user interactions. Events can be used to make web pages interactive by executing JavaScript code when a specific event occurs.

Common HTML Events:

Here are some common events you might encounter:

- onclick: Triggered when an element is clicked.
- onload: Triggered when a page or an image has finished loading.

on mouseover:Triggered when the mouse pointer moves over an element.
on mouseout:Triggered when the mouse pointer moves out of an element.
onkeyup: Triggered when a key is released on the keyboard.

Managing Events and User Interactions with JavaScript:

Let us learn how to manage events and user interactions step-by-step.

Event Handlers:

An event handler is a function that runs when a specific event occurs. You can attach event handlers to HTML elements to make them respond to user actions.

Example: Button Click Event:

Here's an example of how to handle a button-click event:

```
<!DOCTYPEhtml>
<html>
    <head>
        <title>ButtonClickEvent</title>
        <script>
        functionshowMessage({
        alert("Button was clicked!").
}
        </script>
    </head>
  <body>
      <button onclick="showMessage()">Click Me!</button>
</body>
</html>
```

Q.15: How do you create simple interactive form with the help of JavaScript?

Ans. Creating Interactive Elements:

In this section, we will learn how to make web pages interactive by developing

simple programs and forms. We will also learn how to integrate JavaScript with HTML to add interactive functionality.

Developing Simple Programs and Forms:

Forms allow users to input data, which can be processed using JavaScript. Here is an example of a simple form that takes a user's name and displays a greeting message.

Example: Simple Form

Create an "index.html" file with the following content:

```
<!DOCTYPE html>
<html>
<head>
    <title>Interactive Form</title>
    <script>
        function greetUser(){
        varname=document.getElementByld('name').value;
        alert("Hello,"+name+"!");
}
    </script>
</head>
<body>
    <h1>Welcome!</h1>
    <form>
    <label for="name">Enter Your name:</label>
        <inputtype="text"
id="name"name="name">
    <button type="button" onclick="greet User()">Submit</button>
    </form>
</body>
</html>
```

In this example:

The form element contains an input field for the user to enter their name and a button to submit the form.

The onclick attribute of the button calls the greetuser () function when the button is clicked.

The greetuser () function gets the value of the input field and displays an alert with a greeting message.

8.8 Developing and Debugging

Q.16:Explain the importance of debugging in web development and Why is testing important after developing a web page? Discuss different strategies for testing web pages.

Ans. Debugging is a crucial step in web development as it helps in identifying and fixing errors in the code, ensuring that web pages function correctly. Without proper debugging, websites may have broken features, poor user experience, and security vulnerabilities.

Some common debugging techniques include:

1. **Using Browser Developer Tools:** Most web browsers have built-in developer tools that allow developers to view error messages, set breakpoints, and analyze code behavior. The console tool can be used to log messages and check variable values, as shown in the example:

```
console.log("This is a debug message");
var x = 10;
console.log("The value of x is: " + x);
```

2. **Reading Error Messages:** When an issue occurs, browsers display error messages. Carefully reading these messages helps developers understand what went wrong and how to fix it.
3. **Checking Your Code:** Going through the code line by line helps detect syntax errors like missing semicolons, unmatched braces, or incorrect variable names.

Testing:

After completing a web page, testing is essential to ensure that it works properly across different browsers and devices. Without testing, users may experience functionality issues, inconsistent layouts, or poor performance.

Some important strategies for testing web pages include:

1. **Cross-Browser Testing:**

Different browsers interpret HTML, CSS, and JavaScript differently, which can lead to inconsistent layouts.

Solution: Test the webpage in multiple browsers like Chrome, Firefox, and Edge to ensure consistency.

2. **Responsive Design Testing:**

A webpage should be accessible and visually appealing across desktops, tablets, and smartphones.

Solution: Use the browser's responsive design mode to simulate different screen sizes and check how the page adjusts.

3. **User Testing:**

Real users may notice issues that developers overlook.

Solution: Ask friends or family members to use the webpage and provide feedback to improve its usability.

Conceptual Long Questions

Q.1: Explain what Web Development is and discuss the reasons why learning Web Development is important.

Ans. *Web Development* is the process of creating websites and web applications. It involves using various programming languages and tools to design, build, and maintain websites.

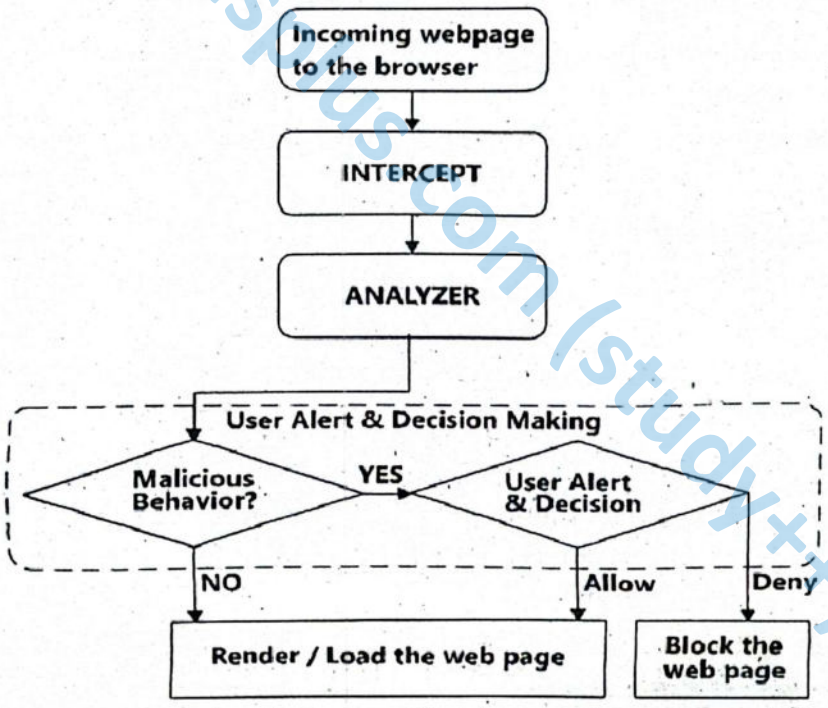
Reasons Why Learning Web Development is Important:

1. **Digital Literacy:** Learning web development helps you understand how websites are made. You get to learn HTML, which is like the skeleton of a web page, CSS,

which makes the web page look appealing, and JavaScript, which adds interactivity. This helps you understand how the internet works.

2. **Career Opportunities:** Web development opens doors to various job prospects in the growing IT industry. You can work as a web developer, web designer, and more. Many companies need web developers to maintain their websites, offering good job opportunities.
3. **Problem-Solving:** Building websites involves solving many problems. For example, if a website is slow, you need to find out why and fix it. This improves your logical thinking and problem-solving skills.
4. **Creativity:** Web development allows you to create visually appealing and interactive websites. You can design cool layouts, choose colors, and add interactive features. You can also create personal blogs or portfolios to showcase your work.
5. **Entrepreneurship:** With web development skills, you can start your own online business. For example, if you make crafts, you can build a website to sell them. You can even create new web services, like fun apps, and share them with the world.

Q.2: Explain how JavaScript makes websites interactive and engaging. Also, describe the flowchart given in Figure for the execution of JavaScript on a webpage.



Ans. JavaScript is a programming language that is used to make websites interactive and engaging. It allows developers to create features like animations, games, and responsive elements that react when a user clicks buttons or moves the mouse. For example, a pop-up message on a webpage or an image changing when the cursor hovers over it is the result of JavaScript.

The flowchart in Figure illustrates how JavaScript executes on a webpage:

1. The incoming webpage is intercepted by the browser.

2. An analyzer checks for any potential malicious behavior.
3. If malicious behavior is detected, the user is alerted and must decide whether to allow or deny the content.
4. If no malicious behavior is found, or the user allows it, the webpage is rendered and loaded.

Q.3: Identifying and fixing common issues is necessary for a functional website. Discuss some common issues in web development and their solutions.

Ans. Web developers often encounter various issues while creating web pages. Identifying and fixing these issues is important to ensure proper functionality and user experience. Some common issues include:

1. **Broken Links:** If a webpage contains links that do not work or lead to incorrect pages, it can negatively affect user experience.

Solution: Double-check all URLs and file paths to ensure they are correct.

2. Incorrect HTML Structure: HTML elements must be properly nested and closed to avoid rendering issues.

Solution: Validate the HTML structure and ensure that all tags are correctly placed.

3. **CSS Issues:** Incorrect CSS selectors or typos in styles can cause visual problems on a webpage.

Solution: Verify that the correct CSS rules are applied. Developers can use the browser's inspector tool to check how CSS is applied to elements.

By addressing these issues, developers can ensure a smooth and functional web experience for users.

Summary

- Web development is the process of creating websites and web applications It involves using various programming languages and tools to design, build and maintain websites.
- Front-end Development focuses on what users see and interact with on a website.
- Back-end Development manages the behind-the-scenes part of a website, like servers, databases, and application logic.
- HTML stands for HyperText Markup Language. It is the standard language used to create web pages. Think of HTML as the building blocks of a website.
- Content in HTML is the main information on a web page that users read and interact with.
- Headings in HTML, ranging from <h1> to <h6>, are used to define the structure and hierarchy of content on a web page.
- Paragraphs in HTML are used to organize and separate text into readable sections.
- Links in HTML are used to connect one web page to another. They allow you click on words or images to go to different parts of the same page or to other pages on the internet.
- In HTML, comments are used to insert notes or explanations within the code.
- Styling with CSS (Cascading Style Sheets) is essential for enhancing the visual appearance of web pages and improving user experience.

- JavaScript is a programming language that is used to make websites interactive and engaging.
- Debugging is the process of finding and fixing issues in your codes.

Additional MCQs

8.1 Web Development

1. **Which of the following is NOT a reason to learn web development according to the text?**
   (a) Digital Literacy
   (b) Career Opportunities
   (c) Time Management
   (d) Problem-Solving
2. **What role does JavaScript play in web development?**
   (a) It makes the web page look nice
   (b) It adds interactivity to the web page
   (c) It serves as the skeleton of the web page
   (d) It is not used in web development
3. **How does web development help in problem-solving?**
   (a) By creating colorful layouts
   (b) By fixing website issues and thinking logically
   (c) By allowing the creation of personal blogs
   (d) By making a website load slower
4. **Why is web development important for entrepreneurs?**
   (a) It helps them build an online presence for their business
   (b) It allows them to become professional designers
   (c) It teaches them how to create mobile applications
   (d) It helps them find jobs in IT companies
5. **Which of the following is NOT a reason to learn web development according to the text?**
   (a) Digital Literacy
   (b) Career Opportunities
   (c) Time Management
   (d) Problem-Solving
6. **What was one of the first web-based email services, and who created it?**
   (a) Yahoo Mail - Larry Page and Sergey Brin
   (b) Hotmail - Sabeer Bhatia and Jack Smith
   (c) Gmail - Mark Zuckerberg and Steve Jobs
   (d) Outlook - Bill Gates and Tim Cook

8.2 Basic Components of Web Development

7. **Which of the following is a primary focus of front-end development?**
   (a) Managing databases
   (b) Adding interactivity to web pages
   (c) Storing web pages on servers
   (d) Processing forms on the back-end

8. **What does CSS primarily help with in web development?**
   (a) Structuring content on web pages (b) Managing servers
   (c) Changing colors, fonts, and layouts (d) Handling database queries
9. **Which combination is required for designing an interactive front-end?**
   (a) CSS, JavaScript, Web Servers (b) HTML, JavaScript, CSS
   (c) PHP, Python, Databases
   (d) Ruby, Back-end Programming, JavaScript
10. **Back-end development includes which of the following components?**
   (a) JavaScript, CSS (b) HTML, Layout
   (c) Databases, Web Servers (d) Animations, Forms
11. **The purpose of a database in web development is:**
   (a) To style web pages (b) To manage and store data
   (c) To create animations (d) To deliver web pages to users
12. **What role does a back-end programming language play in web development?**
   (a) Changing the appearance of a website (b) Adding interactivity to web pages
   (c) Handling tasks like processing forms (d) Structuring the content of web pages
13. **The World Wide Web's first website was created by Tim Berners-Lee, provided:**
   (a) User login systems
   (b) Links to information about the World Wide Web project
   (c) Dynamic animations
   (d) Online shopping features
14. **HTML was created by Tim Berners-Lee in which year?**
   (a) 1995 (b) 1991 (c) 1997 (d) 1999

8.3 Getting Start with HTML

15. **What does HTML stand for?**
   (a) Hyperlinks and Text Markup Language
   (b) Home Tool Markup Language (c) HyperText Markup Language
   (d) High Text Machine Language
16. **Which version of HTML introduced support for multimedia elements like images and videos?**
   (a) HTML 3.2 (b) HTML 4.0 (c) HTML 4.01 (d) HTML 5
17. **Which of the following is a basic tool required to start creating HTML web pages?**
   (a) Spreadsheet (b) Presentation Software
   (c) Text Editor (d) Database
18. **Which of the following is commonly used as a web browser to view HTML files?**
   (a) Microsoft Word (b) Google Chrome
   (c) Excel (d) PowerPoint
19. **The tag used in HTML to define the main heading of a web page is:**
   (a) <p> (b) <title> (c) <h1> (d) <head>

20. **What will happen if you do NOT save an HTML file with the ".html" extension?**
(a) It will open as a normal webpage.
(b) The browser will display the content correctly.
(c) The file may open as plain text instead of a webpage.
(d) It will automatically convert to an HTML file.

21. **Which of the following is the correct syntax to display "Welcome to My Website" as a heading in HTML?**
(a) <title>Welcome to My Website</title>
(b) <h1>Welcome to My Website</h1>
(c) Welcome to My Website
(d) <body>Welcome to My Website</body>

22. **To create and save an HTML file, which file extension should be used?**
(a) txt (b) doc (c) html (d) exe

8.4 HTML Basic Structure

23. **How does web development help in problem-solving?**
(a) By creating colorful layouts
(b) By fixing website issues and thinking logically
(c) By allowing the creation of personal blogs
(d) By making a website load slower

24. **Why is web development important for entrepreneurs?**
(a) It helps them build an online presence for their business
(b) It allows them to become professional designers
(c) It teaches them how to create mobile applications
(d) It helps them find jobs in IT companies

25. **The purpose of the <title> tag in HTML is:**
(a) To define the content of the web page
(b) To Set the title of the web page, displayed in the browser tab
(c) To creates a heading on the web page
(d) To specifie the document type

26. **What is the difference between paired and unpaired tags in HTML?**
(a) Paired tags are for headings, while unpaired tags are for paragraphs
(b) Paired tags have a beginning and end tag, while unpaired tags only have a beginning tag.
(c) Unpaired tags require a closing tag, while paired tags don't
(d) Paired tags are for structural elements, while unpaired tags are for content

8.5 Creating Content with HTML

27. ***Which HTML tag is used for defining headings?***
(a) (b) <h1> to <h6> (c) <title> (d) <header>

28. **The purpose of the <a> tag in HTML is:**
(a) To create tables (b) To insert images
(c) To create hyperlinks (d) To define headings

29. **Which attribute is used in the <img> tag to provide alternative text for images?**
(a) src (b) alt (c) href (d) title

30. **What is the function of <th> in an HTML table is:**
(a) to define a hyperlink (b) to define a table header
(c) insert an image (d) to create a new row

31. **Why are headings important for SEO?**
(a) They make the website colorful.
(b) They help search engines understand content structure.
(c) They add animations to the webpage.
(d) They improve loading speed.

32. **The tag used to create an unordered list in HTML is:**
(a) (b) (c) (d) <dl>

33. **How does using images in HTML benefit the user experience?**
(a) Makes web pages more attractive and engaging
(b) Reduces page speed
(c) Removes unnecessary text
(d) Increases the number of links on a page

34. **What does the mailto: attribute in an anchor <a> tag do?**
(a) Opens a new webpage (b) Sends an email when clicked
(c) Embeds a video (d) Downloads a file

35. **Which tag is used to define a paragraph in HTML**
(a) (b) <para> (c) <h1> (d)

36. **Which of the following tags is used to display tabular data in HTML?**
(a) <table> (b) <list> (c) (d)

37. **Which HTML code correctly creates a hyperlink to "www.example.com"?**
(a) <link="www.example.com">Click Here</link>
(b) Click Here
(c) <url>www.example.com</url>
(d) www.example.com

38. **Which of the following is the correct way to create an ordered list in HTML?**
(a) Item 1
Item 2
(b) Item 1
Item 2
(c) <list><item>Item 1</item><item>Item 2</item></list>
(d) Item 1
Item 2

8.6 Styling with CSS

39. **The main purpose of CSS in web development is:**
(a) To define the structure of a webpage
(b) To improve the visual appearance of webpages
(c) To enhance database connectivity
(d) To execute JavaScript code

40. **A CSS rule consists of:**
(a) Only properties
(b) Only values
(c) Selectors and declarations
(d) HTML and JavaScript

41. **Which CSS rule will set the font size of a paragraph to 16 pixels?**
(a) font-size: 14px;
(b) font-family: Arial;
(c) font-size: 16px;
(d) text-size: 16px;

42. **The advantage of using an external CSS file is:**
(a) To make the HTML document less maintainable
(b) To require CSS to be written within each HTML element
(c) To keep HTML clean and allows styles to be reused across multiple pages
(d) To reduce the file size of the CSS file

43. **What will the following CSS rule do?**
h1 { color: red; font-size: 24px; }
(a) Change the color of all <h1> elements to red and set their font size to 24px
(b) Set the background color of all <h1> elements to red
(c) Set the font-family of all <h1> elements to Arial
(d) Display <h1> elements in italic style

44. **The background-repeat property control is:**
(a) The position of the background image
(b) The repetition of the background image
(c) The size of the background image
(d) The color of the background

45. **What happens when font-family: Arial, sans-serif; is applied?**
(a) All browsers display text in Arial only.
(b) If Arial is unavailable, a generic sans-serif font will be used.
(c) A serif font is selected as the default fallback.
(d) Arial is ignored, and the browser uses a default font.

46. **Which CSS rule would you use to make the text of a paragraph italic and bold?**
(a) font-style: italic; font-weight: bold;
(b) font-size: italic; font-weight: bold;
(c) font-family: italic bold;
(d) font-style: bold; font-weight: italic;

47. **Which of the following best describes the difference between div and section in HTML?**
(a) is used for styling, while <section> is used for grouping related content.
(b) is only for tables, while <section> is for lists.
(c) and <section> are the same.
(d) <section> is used only in CSS.

48. **What does the position: absolute; property do in CSS?**
(a) Moves an element relative to its normal position.

(b) Positions an element relative to its nearest positioned ancestor.
(c) Positions an element fixed on the page.
(d) Aligns text to the right.

49. What will happen if you set animation-iteration-count: infinite; in CSS?
(a) The animation will stop immediatel. (b) The animation will loop forever.
(c) The animation will play only once. (d) The animation will disappear.

50. Why is the transition property important in CSS?
(a) It helps make smooth changes in styles over time.
(b) It hides elements permanently.
(c) It makes elements move automatically.
(d) It is required for all CSS elements.

51. Which CSS code would correctly apply an animation that changes the background color from red to yellow in 4 seconds?
(a) animation: 4s red yellow;
(b) animation-name: example; animation-duration: 4s;
(c) transition: background-color 4s; (d) color: red to yellow;

52. How can you make a box's background color change when hovered over?
(a) Use box:hover { background-color: yellow; }
(b) Use background-hover: yellow;
(c) Use transition-hover: yellow;
(d) Use hover-effect: background-yellow;

8.7 Introduction to Java Script

53. The main purpose of using CSS in web development is:
(a) To add functionality to a webpage
(b) To structure HTML elements
(c) To style and format a webpage
(d) To create a database connection

54. The CSS property used to create space inside an element is:
(a) Margin (b) Padding (c) Border (d) Spacing

55. In a CSS Grid layout, which property defines the spacing between grid items?
(a) grid-gap (b) grid-template (c) align-items (d) flex-wrap

56. What is the function of the display: flex; property in CSS?
(a) It creates a grid layout. (b) It hides the element.
(c) It makes the container a flexbox for responsive alignment.
(d) It increases text size.

57. What is the primary purpose of JavaScript as mentioned in the image?
(a) Designing databases
(b) Making websites interactive and engaging
(c) Managing file systems (d) Writing server-side code

58. Which of the following is NOT a JavaScript data type mentioned in the image?
(a) Boolean (b) Array (c) Function (d) String

59. **What is an event in JavaScript?**
(a) A variable declaration
(b) An action that occurs when a user interacts with a webpage
(c) A CSS property
(d) A function that always runs automatically

60. **Which of the following is NOT a common HTML event?**
(a) onclick (b) on mouseover (c) on exit (d) on key up

61. **The purpose of an event handler in JavaScript is:**
(a) To define HTML structure
(b) To respond to user interactions by executing specific code
(c) To create a new webpage (d) To style web elements

62. **What will the following code display as an alert?**

```
var name = "Ali";
var age = 20;
alert("Name: " + name + ", Age: " + age);
```

(a) Name: Ali, Age: 20 (b) Ali 20
(c) Name: Ali, Age 20 (d) An error message

63. **If you want to create a function in JavaScript that adds two numbers, which keyword is used?**
(a) var (b) function (c) alert (d) add

64. **What will happen when the following button is clicked?**

```
<button onclick="showMessage()">Click Me!</button>
<script>
function showMessage() {
alert('Button was clicked!');
  }
</script>
```

(a) It will display an alert with the message "Button was clicked!"
(b) It will change the button text. (c) It will refresh the page.
(d) It will do nothing.

65. **Which JavaScript function is used to change the background color in the "Changing Background Color" example?**
(a) changeColor() (b) setBackground()
(c) changeBgColor() (d) setColor()

8.8 Getting Start with HTML

66. **What will happen when the following button is clicked?**

```
<button onclick="showMessage()">Click Me!</button>
<script>
  function showMessage() {
    alert('Button clicked!');
  }
</script>
```

(a) It will display an alert with the message "Button clicked!"

(b) It will change the button text. (c) It will refresh the page.
(d) It will do nothing.

67. How does the "Simple Form" example retrieve user input in JavaScript?
(a) Using prompt()
(b) Using document.getElementById('name').value
(c) Using console.log() (d) Using alert()

68. Which JavaScript function is used to change the background color in the "Changing Background Color" example?
(a) change Color() (b) set Background()
(c) change BgColor() (d) set Color()

Answers

1. (c)	2. (b)	3. (b)	4. (a)	5. (c)	6. (b)	7. (b)
8. (c)	9. (b)	10. (c)	11. (b)	12. (c)	13. (b)	14. (b)
15. (c)	16. (b)	17. (c)	18. (b)	19. (c)	20. (c)	21. (b)
22. (c)	23. (b)	24. (a)	25. (b)	26. (b)	27. (b)	28. (c)
29. (b)	30. (b)	31. (b)	32. (a)	33. (a)	34. (b)	35. (a)
36. (a)	37. (b)	38. (a)	39. (b)	40. (c)	41. (c)	42. (c)
43. (a)	44. (b)	45. (b)	46. (a)	47. (a)	48. (b)	49. (b)
50. (a)	51. (b)	52. (a)	53. (c)	54. (b)	55. (a)	56. (c)
57. (b)	58. (c)	59. (b)	60. (c)	61. (b)	62. (a)	63. (b)
64. (a)	65. (a)	66. (a)	67. (b)	68. (a)		

Conceptual MCQs

1. What role does JavaScript play in web development?
(a) It makes the web page look nice. (b) It adds interactivity to the web page.
(c) It serves as the skeleton of the web page. (d) It is not used in web development.

2. If a website needs to process user login data, which combination of technologies would be most effective?
(a) CSS and HTML
(b) Web Servers and Databases
(c) JavaScript and CSS
(d) Front-end programming only

3. A developer is tasked with creating a login system. Which category of web development best describes this work?
(a) Front-end Development (b) Back-end Development
(c) Full-Stack Development (d) UI Design

4. A full-stack developer is working on a user interface for login. What will they most likely handle?
(a) Storing web pages (b) Managing database interactions and UI
(c) Creating animations only (d) Structuring only HTML content

5. **Why is it necessary to refresh the web browser after editing an HTML file?**
   (a) To close the web browser.
   (b) To update the content with the latest changes.
   (c) To delete the cache memory.
   (d) To speed up the browser performance
6. **Why should you use the alt attribute in an <img> tag?**
   (a) To increase the image size
   (b) To help visually impaired users understand the image
   (c) To change the background color (d) To create a hyperlink
7. **What happens if you use <th> instead of <td> in a table row?**
   (a) It creates table headers instead of normal cells.
   (b) It adds an image inside the table.
   (c) It creates a new table within a table. (d) It makes the table disappear.
8. **If a web developer wants to style all <p> elements with a yellow background and blue text, which is the most efficient way?**
   (a) Add the style attribute in each <p> element
   (b) Write an inline style within every <p>
   (c) Use an internal CSS <style> section targeting <p>
   (d) Link to an external CSS file containing p { background-color: yellow; color: blue; }
9. **How can a developer ensure a background image does not repeat and is centered?**
   (a) background-repeat: no-repeat; background-position: center;
   (b) background-repeat: repeat; background-position: left;
   (c) background-repeat: no-repeat; background-position: top left;
   (d) background-repeat: repeat; background-position: bottom center;
10. **According to the flowchart in the image, what happens if JavaScript detects malicious behavior?**
   (a) It executes the script anyway. (b) It blocks the webpage.
   (c) It displays an alert without blocking. (d) It ignores the behavior.

Answers

1.	(b)	**2.**	(b)	**3.**	(c)	**4.**	(b)	**5.**	(b)	**6.**	(b)	**7.**	(a)
8.	(d)	**9.**	(a)	**10.**	(b)								

Additional Short Questions

8.1 Web Development

1. **What is web development?**

Ans. Web development is the process of creating websites and web applications. It

involves using programming languages and tools to design, build, and maintain websites solving problems.

2. Why is digital literacy important in web development?

Ans. Digital literacy helps you understand how websites are made using HTML, CSS, and JavaScript. It enables you to understand how the internet works and how web pages become interactive.

3. How does web development improve problem-solving skills?

Ans. Web development improves problem-solving skills because when you build a website, you face challenges like slow website performance. You need to figure out the cause and fix it, which helps in logical thinking and effectively solving problems.

4. Analyze how career opportunities in web development can impact the IT industry.

Ans. Career opportunities in web development significantly impact the IT industry by meeting the high demand for skilled developers. This growth creates diverse job roles like web designers, front-end developers, and back-end developers, driving innovation and business expansion.

5. How can solving technical issues while building websites develop critical thinking skills?

Ans. Solving technical issues requires identifying problems, analyzing possible causes, and implementing effective solutions. This process helps develop critical thinking as you logically evaluate different approaches to optimize website performance.

6. Explain how web development enhances creativity.

Ans. Web development enhances creativity by allowing you to design visually appealing and interactive websites. You can create unique layouts, use different colors, and add interactive features to make your website stand out

7. Give an example of how web development can be used to promote a small business.

Ans. A small business owner can create a website to display products, add online ordering features, and connect with customers through interactive content. For example, a craft seller can build a website to showcase and sell handmade items globally.

8.2 Basic Components of Web Development

8. What are the main components of front-end development, and what is their purpose?

Ans. The main components of front-end development are:

- **HTML:** Structures the content on web pages (e.g., headings, paragraphs, images, links).
- **CSS:** Styles the content, changing colors, fonts, and layouts to enhance the appearance.
- **JavaScript:** Adds interactivity to web pages, enabling features like forms, animations, and games.

9. What is the role of back-end development in web applications?

Ans. Back-end development manages the behind-the-scenes functionality of websites, such as handling servers, databases, and application logic. It ensures user data and website content are stored, managed, and processed effectively.

10. How do web servers and databases contribute to web development?

Ans. **Web Servers:** Store and deliver web pages to users when they enter a URL.
Databases: Store and manage data like user information, product details, and website content.

11. What distinguishes full-stack development from front-end and back-end development?

Ans. Full-stack development involves both front-end (user interface) and back-end (server and database) development. A full-stack developer handles tasks across both domains, such as user authentication and database interaction.

12. What was the significance of the first website created by Tim Berners-Lee?

Ans. The first website was created in 1991, provided information about the World Wide Web project and is still accessible at http://info.cern.ch.

13. Why would a login system require both front-end and back-end development?

Ans. **Front-end Development:** creates the user interface (UI) for inputting login credentials.
Back-end Development: Handles user authentication, database management, and secure storage of login information.

14. How does CSS enhance user experience in web development?

Ans. CSS improves user experience by styling web pages-changing colors, fonts, and layouts; making websites visually appealing and easier to navigate.

15. What steps would a full-stack developer take to build a login system?

Ans. A full-stack developer would:

1. Develop the UI using front-end technologies (HTML, CSS, JavaScript).
2. Manage user authentication and data storage using back-end technologies (servers, databases).

16. Explain how the components of web development work together to deliver a website to users.

Ans. The front-end ensures what users can see and interact with the website.
The back-end processes data and manages content.
Web servers deliver the web pages, while databases store and retrieve user data.

8.3 Getting Start with HTML

17. What is HTML, and why is it important for creating web pages?

Ans. *HTML* (HyperText Markup Language) is the standard language used to create web pages. It acts as the building blocks of a website, where HTML tags come together to build the structure of web pages.

18. Who created HTML, and in which year was it introduced?

Ans. HTML was created by Tim Berners-Lee in 1991. It was designed to make sharing information on the internet easier.

19. How has HTML evolved over time?

Ans. HTML has evolved through different versions:

HTML 1.0 (1991): Basic features for text and links.

HTML 2.0 (1995): More tags for complex web pages.

HTML 3.2 (1997): Added tables, scripts, and applets.

HTML 4.0 (1997): Support for multimedia like images and videos.

HTML 4.01 (1999): Minor improvements in version 4.0.

HTML5 (2014): New elements for multimedia, graphics, and interactive pages.

20. Why is it necessary to add the ".html" extension when saving an HTML file?

Ans. Adding the ".html" extension helps the computer recognize the file as a web page, allowing it to be opened and viewed correctly in a web browser.

21. What are the two basic tools required to start creating HTML web pages?

Ans. • **Text Editor:** To write HTML code (e.g., Notepad++, Sublime Text, Visual Studio Code).

• **Web Browser:** To view and test HTML files (e.g., Google Chrome, Mozilla Firefox, Microsoft Edge).

22. What is the role of a web browser in HTML development?

Ans. A web browser is used to view and test HTML files, displaying how the web page will appear to users.

23. Why is it important to refresh the web browser after making changes to an HTML file?

Ans. Refreshing the web browser ensures that the latest changes made to the HTML file are displayed. Without refreshing, the browser may show the older version of the page.

24. Write the basic HTML code to display the message "Hello, World!" on a web page.

Ans.
```
<!DOCTYPE html> <html>
<head> <title>My First Web Page</title>
</head>
<body>
 <head> <h1>Hello, World!</h1>
</body>
</html>
```

25. Describe the steps to view an HTML file in a web browser.

Ans. 1. Open your web browser (e.g., Google Chrome, Mozilla Firefox).

2. Double-click on the HTML file (e.g., My_first_website.html).

3. The web page will display the content of the HTML file.

8.4 HTML Basic Structure

26. Why is a well-structured HTML document considered important for both developers and browsers?

Ans. (from the text): A structured HTML document is easier to read and understand.

Properly nested and well-organized elements help developers and browsers interpret the content correctly. This organization ensures that the web page displays as intended.

27. Explain the difference between the <head> and <body> tags in HTML.

Ans. (from the text):

* <head>: This section contains meta-information about the HTML document, such as the title, which is not directly displayed on the page itself but is important for browser functionality and search engines.
* `<body>: This section contains the actual content of the web page that is visible to the user in the browser window.

8.5 Creating Content with HTML

28. What is the purpose of using headings in HTML?

Ans. Headings in HTML help organize content, improve SEO, and maintain consistent formatting across different browsers and devices.

29. What is the role of the <a> tag in HTML?

Ans. The <a> tag is used to create hyperlinks that connect one web page to another or allow users to send emails by using the mailto: attribute.

30. Why are images important in HTML? Images are important in HTML for several reasons:

Ans. Images make web pages more attractive, improve branding, enhance readability, and help visually impaired users understand content through the alt attribute.

31. What is the significance of the <th> tag in HTML tables?

Ans. The <th> tag is used to define table headers, providing context for the data and improving readability.

32. How do headings contribute to better search engine optimization (SEO)?

Ans. Search engines use headings to understand the structure of a web page, which helps in ranking the page higher in search results.

33. How do lists improve the readability of content in HTML?

Ans. Lists break complex ideas into simpler parts, making content easier to scan, understand, and organize.

34. Explain the use of the <img> tag in HTML with an example.

Ans. The <img> tag is used to insert images into a webpage.

Example:

```
<img src="image.jpg" alt="A description of the image">
```

35. Why is it important to use the alt attribute in the <img> tag?

Ans. The alt attribute helps visually impaired users understand images and improves SEO by providing textual descriptions for search engines.

36. How does the <table> tag help in organizing information?

Ans. The <table> tag structures data into rows and columns, making information easy to compare and analyze.

37. Write the HTML code to create a hyperlink to "www.google.com" with the text "Visit Google".

Ans. Visit Google

38. What is CSS and why is it important in web development?

Ans. CSS (Cascading Style Sheets) is essential for improving the visual appearance of webpages and user experience. It allows developers to control fonts, colors, layouts, and overall design while separating content from presentation.

39. Explain the structure of a CSS rule.

Ans. A CSS rule consists of two main parts: a selector and a declaration block. The selector identifies the HTML elements to style, and the declaration specifies the styles to apply, including properties and their values.

40. What is the benefit of using external CSS?

Ans. External CSS keeps the HTML clean, allows for easy updates across multiple pages, and ensures a well-organized code structure.

41. Why should inline CSS be avoided for large projects?

Ans. Inline CSS makes the code cluttered and less maintainable, which is not ideal for large projects.

42. How would you set the text color of all headings to red and the font size to 24px?

Ans. Using this CSS rule:

```
h1 {
  color: red;
  font-size: 24px;
}
```

43. Write a CSS rule to make the text italic and set the font size to 16px for all paragraphs.

Ans.

```
p {
  font-size: 16px;
  font-style: italic;
}
```

44. What is the purpose of using CSS in web design?

Ans. CSS (Cascading Style Sheets) is used in web design to improve the visual appearance of webpages, separate content from presentation, and create responsive, structured, and user-friendly layouts.

45. What is the difference between Divs and Sections in CSS?

Ans. Divs ( ) are generic containers used to group elements and apply styles.
Sections (<section>) are semantic elements used to define distinct sections of a webpage, such as headers, footers, and content areas.

46. How does CSS Grid help in creating webpage layouts?

Ans. CSS Grid allows developers to design complex webpage layouts by arranging elements into rows and columns. It provides precise control over element placement using properties like grid-template-columns and gap.

47. Why is Flexbox useful in CSS?

Ans. Flexbox is useful for creating responsive layouts by arranging items in a row or

column. It helps align content efficiently and provides flexibility using properties like justify-content and align-items.

48. What is the difference between internal and external CSS?

Ans. Internal CSS is written within the <style> tag in the <head> section of an HTML document and applies to that page only. External CSS is written in a separate file and linked to the HTML document, making it reusable across multiple pages.

49. How can you apply a background image in CSS? Provide the rule.

Ans. You can apply a background image using the background-image property:

```
body {
 background-image: url("your-image.jpg");
}
```

50. Why is using an external CSS file considered the most efficient method for larger projects?

Ans. External CSS centralizes style definitions, making it easier to maintain, update, and apply consistent styling across multiple webpages without duplicating code.

51. Write a CSS rule to change the background color of the body to blue and ensure it doesn't repeat.

Ans.

```
body {
 background-color: blue;
 background-repeat: no-repeat;
}
```

52. How would you center a background image on a webpage? Write the CSS rule.

Ans.

```
body {
 background-image: url("your-image.jpg");
 background-position: center;
}
```

53. What is the key difference between margin and padding in CSS?

Ans. Margin creates space outside an element, separating it from other elements. Padding creates space inside an element, between its content and border.

54. Explain the role of positioning in CSS.

Ans. Positioning in CSS allows elements to be placed precisely using properties like top, left, right, and absolute. This helps in structuring webpage layouts effectively.

55. What would happen if the animation-duration property is not defined in a CSS animation?

Ans. If animation-duration is not defined, the animation will not execute because the default duration is 0 seconds, meaning the animation will have no visible effect.

56. How does the *transition* property improve user experience on a webpage?

Ans. The transition property makes style changes smooth instead of abrupt. It enhances user experience by providing gradual visual effects when elements change color, size, or position.

57. How can you create a hover effect to change the background color of a box? Write CSS code.

Ans.
```
box {
  background-color: red;
    width: 100px;
    height: 100px;
    transition: background-color 2s;
}
box:hover {
    background-color: yellow;
}
```

8.7 Introduction to Java Script

58. What is the primary purpose of JavaScript in web development?

Ans. The primary purpose of JavaScript is to make websites interactive and engaging by creating animations, games, and responsive features that react to user actions like clicks or mouse movements.

59. What happens if JavaScript detects malicious behavior on a webpage, as per the flowchart?

Ans. If JavaScript detects malicious behavior, it alerts the user, and based on their decision, the webpage can either be allowed to load or be blocked.

60. Why is the var keyword used in JavaScript?

Ans. The var keyword in Java Script is used to declare variables that store data which can be manipulated in the code.

61. What is an event in JavaScript, and why is it important in web development?

Ans. An event in JavaScript is an action that occurs when a user interacts with a webpage, such as clicking a button or pressing a key. Events are important in web development as they help make webpages interactive by executing JavaScript code in response to user actions.

62. Explain the process of how a simple JavaScript function works, based on the provided example.

Ans. A simple JavaScript function, such as greet(), is declared using the function keyword followed by the function name. The code inside the function runs only when the function is called. For example, the function greet() displays the alert "Hello, Student!" when called.

63. Write a short JavaScript code snippet to declare a variable isPassed with a boolean value and display its value using an alert.

Ans.
```
<script>
var isPassed = true;
  alert("Is Passed: " + isPassed);
</script>
```

64. What is the purpose of the onclick event in JavaScript, and how is it used in a button element?

Ans. The onclick event in JavaScript is used to trigger a function when a user clicks on an element. In a button element, it is used by setting onclick="functionName()", which calls the specified function when the button is clicked. For example:
<button onclick="showMessage()">Click Me!</button>

8.8 Getting Start with HTML

65. What is debugging, and why is it important in web development?

Ans. Debugging is the process of finding and fixing issues in code. It is important in web development to ensure that web pages work correctly by identifying and resolving errors.

66. What are broken links, and how can they be fixed?

Ans. Broken links are hyperlinks that do not point to the correct URLs. They can be fixed by double-checking the paths to the files and ensuring they are correct.

67. What is cross-browser testing, and why is it necessary?

Ans. Cross-browser testing is the process of testing a web page in multiple browsers like Chrome, Firefox, and Edge. It is necessary to ensure consistency in the appearance and functionality of the web page across different browsers.

68. How can a developer check how CSS is applied to elements?

Ans. A developer can use the browser's inspector tool to see how CSS is applied to elements.

Conceptual Short Questions

1. Why are web developers in high demand in the job market?

Ans. Web developers are in high demand because many companies need professionals to create and maintain their websites. This opens up a wide range of job opportunities in the growing IT industry.

2. How does learning web development help in entrepreneurship?

Ans. With web development skills, you can start your own online business.
For example, if you make crafts, you can create a website to sell them, or develop a new web service or app to share with the world.

3. How can a person with web development skills create a personal blog?

Ans. A person with web development skills can create a personal blog by designing the layout with HTML, styling it using CSS, and adding interactive features with JavaScript. This allows them to showcase their artwork, ideas, or experiences.

4. Why is JavaScript essential for creating dynamic web pages?

Ans. JavaScript is essential for adding interactivity and dynamic behaviour to web pages, allowing for features like animations, forms, and games, which make web pages dynamic and engaging.

5. What might happen if you forget to save an HTML file with the ".html" extension?

Ans. If you forget to add the ".html" extension, the computer may not recognize the file

as a web page, and it won't open correctly in a web browser. It may open as a plain text file instead.

6. Analyze the use of the font-family property in the given example. How does it ensure compatibility across devices?

Ans. The font-family property specifies multiple font options, ensuring that if the primary font (e.g., Arial) is unavailable, a fallback font (e.g., sans-serif) will be used, maintaining text readability across devices.

7. Analyze the addNumbers(a, b) function. What is its purpose, and how does it work?

Ans. The add Numbers(a, b) function takes two parameters, a and b. It adds the two numbers and returns their sum (a + b). This function is useful for performing addition operations dynamically with different inputs.

8. Explain the role of an event handler in JavaScript. How does it help in managing user interactions?

Ans. An event handler is a function that runs when a specific event occurs. It helps manage user interactions by allowing developers to define specific actions in response to user events, such as button clicks or key presses, making webpages more dynamic and interactive.

Exercise Questions

A. Multiple Choice Questions.

1. Which of the following tag is not a correct HTML tag?

(a) (b) (c) <head> (d) <footer>

2. What does CSS stand for?

(a) Cascading Style Sheets (b) Computer Style Sheets
(c) Creative Style Sheets (d) Colorful Style Sheets

3. Which of the following tag is used to create a hyperlink in HTML?

(a) <link> (b) <a> (c) <href> (d) <nav>

4. Which property is used to change the background color in CSS?

(a) color (b) background-color (c) bgcolor (d) background

5. Which HTML attribute is used to define inline styles?

(a) class (b) style (c) font (d) styles

6. Which of the following is the correct syntax for a CSS rule?

(a) selector {property:value;} (b) selector: {property=value;}
(c) selector {property=value} (d) selector: {property: value:}

7. In JavaScript, which markup is used for comments?

(a) /**/ (b) //. (c) <- (d) /**/

8. How do you include JavaScript in an HTML document?

(a) <script *src*="script.js"> </script> (b) <java src="script.js"> </java>
(c) <js src="script.js"> </js> (d) <code src="script.js"> </code>

9. Which HTML tag is used to create an unordered list?

(a) (b) (c) (d) <list>

10. Which tag is used to display a horizontal line in HTML?

(a)
 (b) <hr> (c) <line> (d) <hline>

Answers

1. (d)	**2.** (a)	**3.** (b)	**4.** (b)	**5.** (b)
6. (a)	**7.** (b)	**8.** (a)	**9.** (b)	**10.** (b)

B. Short Questions

1. What is the purpose of the <head> tag in HTML?

Ans. The <head> tag contains meta-information about the HTML document, such as the title, character set, stylesheets, and scripts.

2. Explain the difference between an ordered list and an unordered list in HTML.

Ans. An ordered list displays items in a numbered sequence, using <ol>, tags while an unordered list displays items with markers, typically bullets, using <ul> tags.

3. How do you add a comment in CSS?

Ans. You add a comment in CSS by using /* to begin the commen and */. to end it.

4. What are the different ways to apply CSS to an HTML document?

Ans. There are three main ways to apply CSS to an HTML document:

Inline CSS: Apply styles directly to an HTML element using the bald attribute.

Internal CSS: Embed CSS within the <style> tags in the <head> section of the HTML document.

External CSS: Create a separate CSS file and link it to the HTML document using the <link> tag in the <head>, section.

5. How can you include JavaScript in an HTML file?

Ans. You can include JavaScript in an HTML file using the <script> tag, which can be placed either in the <head> or the <body> section.

6. Describe the syntax for creating a hyperlink in HTML.

Ans. The basic syntax for creating a hyperlink in HTML is: Link text.

7. What is the function of the tag in HTML?

Ans. The tag is a generic container element that divides the HTML document into logical sections. It allows you to group and styling content.

8. How do you link an external CSS file to an HTML document?

Ans. You link an external CSS file using the <link> tag in the <head> section of your HTML document. The **href** attribute specifies the path to the CSS file.

9. What is the use of the <table> tag in HTML?

Ans. The <table> tag defines a table structure in HTML. It is used to display data in rows and columns.

10. Explain the box model in CSS.

Ans. The CSS box model represents every HTML element as a rectangular box with the box model defining the space around its content.

C. Long Questions.

Q.1: Doiscuss the fundamental differences between HTML, CSS, and Java Script in context of web development.

HTML	CSS	JAVA SCRIPT
HTML is the standard language used to create web pages.	CSS allows web developers to control the color,fonts,layout,and overall design of HTML elements,separating the content from the presentation.	JAVA-Script is a programming language that is used to make websites interactiveand engaging.It allows developers to creat things like animations,games,and responsive features that react when you click buttons oe move your mouse.
To create a basic HTML application that displays "a message" on a web page, follow these simple steps: 1. Open your text editor: You can use. Notepad. Notepad++,Sublime Text. or any other text editor. Write the HTML Codes: In your text editor, the type following HTML code into your text 3. Save your file with a html extension, for example, My first_website.html.	Styling Ways Inline Styles Internal Styles External Styles	Example when you see a pop-up message on a web page or when an image change when you hover over it ,that JavaScript at work .Execution of JavaScript in a flowchart.

Example
<!DOCTYPE html>
<html>
<head>
<title>My First Web Page</title>
</head>
<body>
<hl>Welcome to My welcome</hl>
 This is my first web page. I am learning HTML in the 9.
Class!
</body>
</html>
	Selector {property:value;}
	For example ,a simple CSS rule can change the color and size of all heading on a page:
	hl{
	color:red;
	font-size:
	24px;
	}
	In this example, the CSS rule targets al <hl> elements setting their text color to red and font size to 25 pixles.
		Syntax : <DOCTUPE html>
		<html>
		<head>
		<title>JavaScript Example
		</title>
		</head>
		<body>
		<hl> Welcome to JavaScript</hl>
		Alert(''Hello,9 class students!)
		</script>
		</body>
		</html>

Q.2: Explain the process of setting up a development environment for web development. By discussing the necessary softwares and tools.

Ans. See Question no. 4

Q.3: Create a basic HTML page that includes a header, a paragraph, an image, and a hyperlink.

Ans. HTML Structure:

html

Run

Copy code

```
<!DOCTYPE html>
<html lang="en">
<head>
  <meta charset="UTF-8">
  <meta name="viewport" content="width=device-width, initial-scale=1.0">
  <title>My Basic Page</title>
</head>
<body>
  <h1>My Website Header</h1>
  <p>This is a simple paragraph of text.</p>
  <img src="image.jpg" alt="Image Description">
  <a href="https://www.example.com">Click here to visit Example.com</a>
</body>
</html>
```

Q.4: "How do you style a table using CSS? Create a sample table and apply styles to it."

1. Basic HTML Table Structure:

First, we need a basic HTML table. Here is an example:

```
<table>
<thead>
    <tr>
    <th>Firstname</th>
    <th>Lastname</th>
    <th>Age</th>
 </tr>
 </thead>
 <tbody>
 <tr>
    <td>Jill</td>
    <td>Smith</td>
    <td>50</td>
  </tr>
  <tr>
```

```
      <td>Eve</td>
      <td>Jackson</td>
      <td>94</td>
    </tr>
    <tr>
      <td>John</td>
      <td>Doe</td>
      <td>80</td>
    </tr>
  </tbody>
</table>
```

This creates a table with a header (<thead>) and a body (<tbody>). <tr> represents table rows, <th> represents table header cells, and <td> represents table data cells.

2. **CSS Styling:** Now, let us add some CSS to style the table. Here is a comprehensive example covering many common styling needs:

```
table {
width: 100%; /* Make the table take full width */
border-collapse: collapse; /* Collapse borders for a cleaner look */
margin-bottom: 20px; /* Add some spacing below the table */
box-shadow: 2px 2px 5px rgba(0, 0, 0, 0.1); /* Add a subtle shadow */
}
th, td {
 border: 1px solid #ddd; /* Add borders to cells */
 padding: 8px; /* Add padding inside cells */
 text-align: left; /* Align text to the left */
}
th {
 background-color: #f2f2f2; /* Light gray background for header */
 font-weight: bold; /* Make header text bold */
 text-transform: uppercase; /* Uppercase header text (optional) */
}

tr:nth-child(even) {
 background-color: #f9f9f9; /* Light gray background for even rows */
}

tr:hover {
 background-color: #e0e0e0; /* Highlight row on hover */
}
/* Style the table caption (if you have one) */
caption {
caption-side: top; /* Position caption at the top */
font-style: italic; /* Italic caption text */
color: #777; /* Gray caption text */
```

```
padding: 5px;
}
```

3. **Applying the CSS:** You can include the CSS in your HTML in a few ways:

1. **Inline Styles (Less Recommended):** Add a **style** attribute directly to the table element. Avoid this for larger style blocks as it makes your HTML messy and harder to maintain.
2. **Internal Style Sheet:** Add a <style> tag within the <head> of your HTML document. This is suitable for smaller style sets.
3. **External Style Sheet (Best Practice):** Create a separate CSS file (e.g., styles.css) and link to it in your HTML:

```
<link rel="stylesheet" href="styles.css">
```

Explanation of CSS Properties:

- **border-collapse:** Collapses cell borders into a single border, preventing double borders.
- **width:** 100%: Makes the table take up the full width of its container.
- **padding:** Adds space inside table cells.
- **text-align:** Aligns text within cells.
- **background-color:** Sets the background color.
- **font-weight:** Sets the font weight (e.g., bold).
- **text-transform:** Changes the capitalization of text.
- **nth-child(even):** Selects even rows for styling (useful for alternating row colors).
- **tr:hover:** Styles rows when the mouse hovers over them.
- **box-shadow:** Adds a shadow effect to the table.
- **caption-side:** Defines where the caption should be placed (top or bottom).

This example provides a good starting point. You can customize the CSS further to achieve the exact look you want for your table. Remember to choose colors, fonts, and spacing that fit your website's overall design.

Q.5: Describe the different CSS selectors and provide examples of each.

Ans. For Answer See Q10

Q.6: Explain the process of creating a responsive web page using CSS with the help of examples and explanations.

Ans. For Answer See Q9

Q.7: Write a JavaScript function that changes the background color of a web page when a button is clicked. Provide the complete code and explain how it works.

Ans. For Answer See Q11, 12

Q.8: How do you add animations and transitions using CSS? Provide examples and explain the properties invalved.

Ans. For Answer See Q8, 9