Module 2 – Mernstack – HTML

HTML Basics :

Theory Assignment

Question 1: Define HTML. What is the purpose of HTML in web development?

Answer: **HTML (HyperText Markup Language)** is the standard markup language used to create and structure content on web pages.

It is not a programming language — it is a **markup language** used to describe the structure of content using elements (tags).

Purpose of HTML in Web Development

HTML is the backbone of every website. Its main purposes are:

1. Structure the web content
    - Headings, paragraphs, images, links, tables, forms, etc.
2. Define page layout
    - Dividing page into header, body, footer, sections.
3. Link pages together
    - Using hyperlinks (<a> tag).
4. Embed media
    - Images, audio, video, iframes.
5. Work with CSS and JavaScript
    - HTML provides structure
    - CSS provides styling
    - JavaScript provides interactivity

Without HTML, a browser cannot understand what to display.

----------->>>>>>>>>>>>>>>>>>>>>>>>

Question 2: Explain the basic structure of an HTML document. Identify the mandatory tags and their purposes.

Answer: Mandatory Tags and Their Purposes

Tag		Purpose
<!DOCTYPE html>	-	Tells browser this document is HTML5
<html>	-	Root element of the webpage
<head>	-	Contains metadata (title, links, styles, scripts)
<title>	-	Title shown on browser tab
<body>	-	Visible content of webpage

Example:

```
<html>
<head>
```

```
  <title>My Web Page</title>
</head>
<body>
  <h1>Hello World</h1>
</body>
</html>
```

Head → information for browser
Body → information for user

--->>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>

Question 3: What is the difference between block-level elements and inline elements in HTML? Provide examples of each.

Answer: HTML elements are mainly divided into two types:

Feature	**Block-Level Elements**	**Inline Elements**
Start on new line	Yes	No
Take full width	Yes	Only required width
Can contain other elements	Yes	Mostly text/inline
Used for layout	Yes	For small content

Block-Level Elements (Examples)

- <div>
- <p>
- <h1> to <h6>
- <section>
- <article>

These elements create structure of the page.

Inline Elements (Examples)

- <span>
- <a>
- <strong>
- <em>
- <img>

--->>>

Question 4: Discuss the role of semantic HTML. Why is it important for accessibility and SEO? Provide examples of semantic elements.
Answer:
Semantic HTML means using HTML tags that describe the meaning of the content, not just its appearance.
Instead of using many <div> tags, we use meaningful tags.

- **Semantic Elements:**

- <header>
- <nav>
- <section>
- <article>
- <footer>
- <main>
- <aside>

Syntax of Semantic Element:

```
<header>
  <h1>My Blog</h1>
</header>

<nav>
  <a href="#">Home</a>
  <a href="#">About</a>
</nav>

<main>
  <article>
    <h2>Post Title</h2>
    <p>Post content...</p>
  </article>
</main>

<footer>
  Copyright 2026
</footer>
```

Why Semantic HTML is Important?

Benefit		Explanation
Accessibility	-	Screen readers understand page structure easily
SEO	-	Search engines understand content better
Readability	-	Code becomes easy to understand
Maintainability	-	Easier for developers to manage layout

--->>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>

Lab Assignment

• Task: Create a simple HTML webpage that includes:

  • A header (), footer (), main section (), and aside section ().

  • A paragraph with some basic text.

  • A list (both ordered and unordered).

- A link that opens in a new tab.

Answer:

```
<!DOCTYPE html>
<html lang="en">
<head>
    <title>Simple Semantic Webpage</title>
</head>
<body>

    <header>
        <h1>Welcome to My Simple Webpage</h1>
    </header>
    <main>
        <h2>Main Content</h2>
        <p>
            This is a simple paragraph demonstrating basic HTML content.
            HTML helps in structuring the webpage using semantic elements.
        </p>
        <h3>Unordered List</h3>
        <ul>
            <li>HTML</li>
            <li>CSS</li>
            <li>JavaScript</li>
        </ul>
        <h3>Ordered List</h3>
        <ol>
            <li>Learn HTML structure</li>
            <li>Apply CSS styling</li>
            <li>Add interactivity with JavaScript</li>
        </ol>
        <p>
            <a href="https://www.example.com" target="_blank" rel="noopener
                        noreferrer">Example Website</a>
        </p>
    </main>
    <aside>
        <h3>Aside Section</h3>
        <p>This is the aside section for extra information like ads, links, or
notes.</p>
    </aside>
    <footer>
        <p>&copy; 2026 My Website. All rights reserved.</p>
    </footer>
</body>
</html>
```

HTML Forms

Theory Assignment

Question 1: What are HTML forms used for? Describe the purpose of the input, textarea, select, and button elements:

Answer: HTML forms are used to collect user data and send it to a server for processing.

Common examples:

- Login / Signup
- Contact forms
- Feedback forms
- Search bars
- Registration forms

A form is created using the <form> tag, and inside it we place different form controls.

Main Form Elements:

Element	Purpose	Example Use
<input>	Single-line data entry (many types)	Name, email, password, date
<textarea>	Multi-line text input	Address, comments, feedback
<select>	Dropdown list of options	City, country, category
<button>	Submit or trigger action	Submit, reset, custom JS action

Description:
<input> has types like text, email, password, radio, checkbox, date, etc.
<textarea> is ideal when the user needs space to write.
<select> prevents typing mistakes by giving fixed choices.
<button type="submit"> sends the form data.

--->>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>

Question 2: Explain the difference between the GET and POST methods in form submission. When should each be used?
Answer: When a form is submitted, data is sent to the server using HTTP methods — mainly GET and POST.

Feature	**GET**	**POST**
▪ Where data appears	In URL	In request body
▪ Visibility	Visible to user	Not visible
▪ Data limit	Limited (URL length)	Large amount allowed
▪ SecurityLess	secure	More secure
▪ Bookmarkable	Yes	No
▪ Used for	Fetching data	Sending sensitive data

Example:
GET: example.com/search?name=ram&city=jaipur
POST: Data is hidden inside the request body.
When to use: - **GET**: Search forms, filters, non-sensitive queries
POST: Login, signup, payment, personal data

Question 3: What is the purpose of the label element in a form, and how does it improve accessibility?
Answer:
Purpose of <label>

- Connects text with input field
- Improves accessibility for screen readers
- Better user experience — clicking the label focuses the input
- Helps users understand what to enter

Accessibility win

- Screen readers read the label before the input
- Larger clickable area (label + input)
- Essential for visually impaired users

Lab Assignment

• **Task:** Create a contact form with the following fields:

• Full name (text input)

• Email (email input)

• Phone number (tel input)

• Subject (dropdown menu)

• Message (textarea)

• Submit button Additional Requirements:

• Use appropriate form validation using required, minlength, maxlength, and pattern.

• Link form labels with their corresponding inputs using the for attribute.

Answer:

```
<!DOCTYPE html>
<html lang="en">

<head>
    <title>Contact Form</title>
</head>

<body>

    <div>
        <h2>Contact Us</h2>

        <form action="#" method="post">
            <label for="fullname">Full Name</label>
```

```
            <input type="text" placeholder="Enter your full name" /><br>
            <!-- Email -->
            <label for="email">Email</label>
            <input type="email" required placeholder="Enter your email"><br>
            <!-- Phone Number -->
            <label for="phone">Phone Number</label>
            <input type="tel" required pattern="[0-9]{10}" placeholder="10-
                                digit phone number" /> <br>
            <!-- Subject Dropdown -->
            <label for="subject">Subject</label>
            <select name="subject" required>
                <option value="">-- Select Subject --</option>
                <option value="support">Support</option>
                <option value="feedback">Feedback</option>
                <option value="inquiry">General Inquiry</option>
            </select> <br>

            <!-- Message -->
            <label for="message">Message</label>
            <textarea rows="4" required minlength="10" maxlength="300"
                placeholder="Write your message here..."></textarea> <br>
            <!-- Submit Button -->
            <button type="submit">Submit</button>
        </form>
    </div>
</body>

</html>
```

HTML Tables

Theory Assignment

Question 1: Explain the structure of an HTML table and the purpose of each of the followingelements: <table>, <tr>, <th>, <td>, and <thead>.

Answer:- Basic structure:

```html
<table>
    <thead>
        <tr>
            <th>Name</th>
            <th>Age</th>
        </tr>
    </thead>
    <tr>
        <td>Ram</td>
        <td>22</td>
    </tr>
</table>
```

Purpose of each element

Element	Purpose
<table>	Defines the table
<tr>	Table row
<th>	Table header cell (bold, centered)
<td>	Table data cell
<thead>	Groups header content of table

- **<thead>** helps browsers and screen readers understand the header section.
- You can also have **<tbody>** and **<tfoot>** for better structure.

-->>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>

Question 2: What is the difference between col-span and row-span in tables? Provide examples.

Answer: Both attributes are used to merge cells.

Attribute	Meaning	Direction
colspan Merge	columns	Horizontal
rowspan	Merge rows	Vertical

Example of col-span:

```html
<tr>
    <th colspan="2">Student Info</th>
</tr>
```

Example of row-span:

```
<tr>
    <td rowspan="2">Ram</td>
    <td>Math</td>
</tr>
<tr>
    <td>Science</td>
</tr>
```

--->>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>

Question 3: Why should tables be used sparingly for layout purposes? What is a better alternative?

Answer: Developers used tables to design full webpage layouts. This is bad practice now.

Problems with using tables for layout

- Makes code complex and hard to maintain
- Poor accessibility for screen readers
- Not responsive on mobile devices
- Mixes content with layout
- Bad for SEO

Better alternatives

- Use CSS layout techniques:
- Flexbox
- CSS Grid
- Semantic HTML (<header>, <main>, <section>, etc.)

These methods are:

- Responsive
- Clean
- Accessible
- SEO-friendly

--->>>

Lab Assignment

- **Task**: Create a product Catalog table that includes the following columns:
    - Product Name
    - Product Image (use placeholder image URLs)
    - Price
    - Description

- Availability (in stock, out of stock)

Additional Requirements:

- Use thead for the table header.
- Add a border and some basic styling using inline CSS.
- Use col-span or row-span to merge cells where applicable

Answer:

```
<!DOCTYPE html>
<html lang="en">
<head>
    <title>Product Catalog</title>
</head>
<style>
    th{
        border: 2px solid black;
    }
    td{
        border: 2px solid black;
    }
</style>
<body>

<h2 style="text-align:center">Product Catalog</h2>

<table style="border: n; padding: 30px 30px; margin:auto">

    <thead style="background-color:#f2f2f2;">
        <tr>
            <th>Product Name</th>
            <th>Product Image</th>
            <th>Price</th>
            <th>Description</th>
            <th>Availability</th>
        </tr>
    </thead>

    <tbody>
        <!-- Rowspan example -->
        <tr>
            <td rowspan="2">Smart Watch</td>
            <td rowspan="2">
                <img src="https://m.media-
amazon.com/images/I/4132PvY2IGL._AC_SR290,290_.jpg" height="100px" alt="Smart
Watch">
```

```html
            </td>
            <td >$120</td>
            <td >Fitness tracking, heart rate monitor</td>
            <td >In Stock</td>
        </tr>
        <tr>
            <td>$110</td>
            <td>Limited time discount</td>
            <td>In Stock</td>
        </tr>

        <!-- Normal row -->
        <tr>
            <td>Wireless Earbuds</td>
            <td>
                <img src="https://encrypted-
tbn0.gstatic.com/images?q=tbn:ANd9GcT2oI3ypm3jBVSvqR3nMQtvI393lqnLfUTl1g&s"
height="100px" alt="Earbuds">
            </td>
            <td>$60</td>
            <td>Noise cancellation, long battery life</td>
            <td>Out of Stock</td>
        </tr>

        <!-- Colspan example -->
        <tr>
            <td>Laptop Backpack</td>
            <td>
                <img src="https://safaribags.com/cdn/shop/files/1_a4945103-
5732-41b3-af8e-0b30903cc925.jpg?v=1710235025" height="100px" alt="Backpack">
            </td>
            <td colspan="2" style="border:1px solid black;">Spacious bag with
USB charging port</td>
            <td>In Stock</td>
        </tr>
    </tbody>

</table>

</body>
</html>
```

-->>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>