ASSIGNMENT 1

Q 1 => What is HTML & its attributes? explain the structure of a basic HTML document with examples.

Soln => HTML is used to structure web pages. tag define elements & attributes provide additional informations

Exp => of attribute

```
<a href = "https://example.com target = "_blank" > </a>
```

Basic HTML structure =>

```
<!DOCTYPE html>
<html>
<head>
    <title> My Web Page </title>
</head>
<body>
    <h1> Welcome </h1>
</body>
</html>
```

Q 2 What are the different types of input fields in a HTML forms?

In HTML forms there are various types of input fields that allow users to enter different types of data, below are the most

Commonly used input types

(1) Text Based types =>

< Input type = "password" >
< input " " "text" >
< input " " "email" >
< input " " "search" >
< input " " "tel" >
< input " " "url" >

(2) Numeric Inputs

< input type = "number" >
< input type = "range" >

(3) Date & Type Inputs

input type = "date" > selects a date (year, month & day)
< input type = "time" >

(4) Selection inputs

< input type = "checkbox" >
< " " " "radio" >

(5) Files & media inputs

< input type = "file" >
< " " " "radio" > image

(6) Button inputs

< input type = "sumbit" >

Q3 Explain the role of the <table> tag in HTML & discussion of its properties for designing a webpages in HTML.

The <table> in HTML is used to create & display tabular data in an organized format with rows & column.

Properties of the <table> tage for web design =>

(1) Border - defines the visible boundary of the table & its cells.

(2) Cell padding & cell spacing → it control the space inside & between table cells.

(3) Column & row merging => Cell span property allows a single cell to span multiple columns while rowspan allows a cell to stretch across multiple rows

(4) Header styling → the <th> tag is used to define headers which are bold & centre by default.

(5) Table with the height → these properties define the overall dimensions of the table & its cells.

Q4 => Explain the role of Python in web development. Describe the key features of the flask web framework?

Solution => Python is widely used for web development due to its simplicity, scalability & rich eco-system.

- Backend Development => Handles server-side logic & user authentication.

(2) Web frameworks => Uses Django & flask for faster development.

(3) API Development => Creates Restful APIs with flask & FastAPI.

(4) Database management => Supports MySQL postgreSQL, MongoDB

(5) Security & Scalability => Ensure secure & scalable applications

(6) Automation & Scripting => Automates web tasks like testing & scraping

(7) AI & Data Science Integration => Adds machine learning features to web pages.

Key features of flask in web dep development =>

ain the role of
Describe the key
framework?

(1) Light weight & minimalistic - Simple & easy to use
(2) Built in server & Debugging - Enables local testing
(3) Routing System → Manages URL navigation
(4) Jinja2 Templating → Renders dynamic HTML
(5) Restful API Development - Easily Build APIs.
(6) DATABase Integration → Supports SQL & NoSQL.
(7) Security & Authentication → Protects against threats
(8) Scalability & flexibility - Ideal for micro services & web apps.

Q5 = Explain the role of GIFs in adding animation to webpages & discuss their advantages & limitation.

- GIFs (Graphics Interchange format) are widely used to add simple animation to web pages. The work by displaying a sequence of images in a loop, creating motion without requiring additional plugins or scripting

ADVANTAGES OF GIFs in web animation=>

(1) Easy Implementation → GIFs can be embedded like regular images using <img> tags.

(2) Wide compatibility → Supported by all web browsers & devices

(3) No need for plugins - Unlike flash, GIFs don't require extra software to display.

(4) Lightweight for simple animation - ideal for short, looping animations.

Limitation of GIFs =>

(1) Limited color palette → Supports only 256 colors, leading to lower quality visual.

(2) Large file sizes → High resolution or long GIFs can slow down web pages.

(3) No Interactivity - GIFs can't be controlled (paused, played or skipped).

(4) Inefficient for complex Animation => formats like mp4, webp or CSS animations are better alternatives.

Q=6. Define Image maps & explain how to create a clickable area on image that links to different destinations.

Solution =>

Image maps allows defining clickable areas on an image that link to different destinations =>

Creating clickable areas =>

(1) Use the <map> tag to define image map.

(2) Use the <area> tag within <map> to define each clickable area.

(3) Use the usemap attribute to the <img> tag to reference the image map.

Code =>

```
img src = "exp.jpg" usemap = "#example" >
 1 area shape = "rect" coords = "5, 7, 9, 27"
  href = "http://exp.com/section/"
        alt = "section/" >
 2 areashape = "square" coords = "50, 50, 20, 30"
      href = "http://exp.com/section2"
           alt = "section2" >
```

Q 2 => How do HTML forms collect use data? Explain with examples of different form elements.

Ans => HTML forms use various form elements to common form elements :-

animation=)

<input> : collect data like text, passwords, emails.

<textarea> → collects multiple text input.

<select> → collects data through a dropdown list

<button> → submits the form.

Code =>

```
<form action = "/submit" method = "post">
    <label for = "Name"> Name: </label>
    <input type = "text" id = "name" name = >
    < label for = "email"> Email name = "email">
<label for = "email"> Email: </label>
< input type = "email" id = "email" name = "email">
<label for = "message"> message </label>
<input
<textarea id = "message" name = "message" > text
< input type = "submit" value = "submit">
</form>
```

<input>

ASSIGNMENT 2

Q => How do you apply CSS to an HTML document ?

Solution => Applying CSS to an HTML document involves a series of steps that enable the browser to render the styled document :-

HTML Parsing => The browser reads the HTML document & breaks it down into individual element, creating a document object model (DOM) tree.

CSS Parsing => The browser reads the CSS code, weather, inline, internal or external, and breaks it down into individual rules.

CSSOM Construction => The browser construct a CSS Object model (CSSOM) tree, which is hierarchical representation at CSS rules.

Matching & Attachment => The browser match the CSS selectors with the corresponding HTML elements in the DOM tree & attaches the style to those elemant

Layout & Rendering => The browser calculates the layout of the document, taking into account the styles & rendens the final visual representati

Painting & Compositing => the browser paint the individual elements & composites them together to form the finalre rendered document.

Q2 => Define DHTML & explain how it integrates HTML, CSS & JavaScript to create dynamic & interactive web pages.

Soln => DHTML is a collective term for a set of technologies used to create dynamic & interactive web pages. It combines the strengths of HTML, CSS & JavaScript to enable the creation of web pages that can change & respond to used interaction in real time.

DHTML integrates HTML, CSS & JavaScript in the following ways =>

(1) HTML (Structure) =>
- Provides the basic structure & content of the web page.
- Defines the element & their relationship.

(2) CSS (Presentation)
- Control the layout, visual styling & user interface element.
- Define the look & feel of the web page.

JavaScript (Behaviour) =>

- Add dynamic behaviour & interactivity to the webpage.
- Responds to user events, such as clicks, hover & keyboard inputs.
- Manipulates the HTML & CSS to update the webpage in real time.

Q3 => What is XML & how it used in web development & provide an example of each?

XML (Extensible markup language) is a markup language used for storing & transporting data between system, applications & organizations. It is a flexible, self descriptive & platform independent language. That allows users to define their own tags & structure.

Uses of XML in web page =>

(i) Data exchange => XML is used to exchange data between different systems, applications & services

(ii) Data storage => XML is used to store data in a structured & organized way.

(iii) Configuration fields => XML is used to create configuration files for applications & structures.

(iv) RSS & Atom feeds => XML is used to create RSS & Atom feeds for publishing & subscribing to content.

(v) SOAP & RESTful web services => XML is used to create SOAP & Restful web services for exchanging data between system.

Exp of XML Usage =>

exp 1 => Data exchange

Suppose we have an e-commerce website that needs to exchange product information with a supplier's system. Product data & exchange it between the two system.

Exp 2 Data Storag => Suppose we have a blog that steres its articles in an XML file.

Exp 3 Configuration file => Suppose we have a web application that needs to store its configuration settings in an XML file.

Exp 4 = RSS Feed :-

Suppose we have a blog that needs to publish its articles in an RSS feed.

Q 9 :) How does HTML Handle multimedia content ?

Solution => HTML Provides several elements & attributes to handle multimedia content, including :

* images
  - The <img> element is used to add image to a webpage
  - The <src> attributes specifies the URL of the image file.
  - <alt> attribute provides ~~the~~ alternative text for the image

* Audio =>
  - the <audio> element is used to add audio files to a webpage.
  - the <src> attributes specifies the URL of the audio file.
  - The <controls> attributes add audio controls, such as play, pause, volume.

* Video =>
  - The <video> element is used to add video files to a web page.
  - The <src> attributes specifies the URL of the video file.
  - the <controls> attributes add video controls such as play, pause & volume.

Q5 Define XML & explain the key difference between XML & HTML in terms of purpose & structure.

XML	HTML
1) Designed for storing & transporting Data	1) Designed for displaying data on web page
2) Strict rules, used defined tags	2) Predefined tags. Lenient syntax
3) Highly flexible	3) Limited flexibility
4) Errors must be corrected for processing	4) Browsers can still render pages with minor errors
5) focuses on structuring & storing data.	5) focuses on presentation & layout.

Q6 ⇒ Explain the role of <canvas> & <svg> elements in creating graphical content in HTML5.

- <Canvas> - It provides a bitmap-based drawing area for rendering graphics using JavaScript. It is ideal for dynamic, pixel based graphics like animations, games & real time visualization.

... the key

- <svg> = It is used for ~~vet~~ vector based graphics, meaning images remain sharp regardless of scaling. It is suitable for static graphics like icons, charts & illustrations.

(7) Compare DTD & XML schema, highlighting their roles in defining XML document structure & validation.

DTD	XML
(1) Document type Definition	(1) Schema (XSD - XML schema Definition)
(2) Defines XML document structure & validates data	(2) Defines XML structure with strong data typing & validation
(3) Uses its own syntax (not XML based)	(3) Written in XML, making it easier to used & extend
(4) Less readable and harder to extend	(4) more readable & extensible.

Q8=> Describe how XML can be transformed using XSL & XSLT.

Solution =>

XSL -> Extensible Stylesheet language

XSLT -> Extensible Stylesheet language Transformations.

XSL => A styling language for XML, which includes XSLT for transformation, Xpath for navigation & XSL for formatting

XSLT => A powerful XML based language used to transform XML documents into different format, as plain text. It works by applying templates & rules to an XML document.

How it works =>

- An XSLT stylesheet defines how an XML document should be transformed.
- Xpath is used to locate & extract elements from XML.
- The XSLT processor applies the transformation rules to generate the desired output.

(9) Briefly define DOM & Discuss its Role in accessing & manipulating HTML & CSS dynamically.

DOM = The document object model is a Programming interface for HTML & XML documents. It represents the page as a tree like structure where elements are nodes that can be accessed, modified or deleted using javascript.

Roles in accessing & manipulating HTML & CSS Dynamically =>

(1) Accessing elements => Javascript can select elements using methods like getElementById(), querySelector() etc.

(2) Modifing content => Allows updating text, attributes, & styles dynamically (innerHTML, textContent)

(3) Manipulating styles => CSS properties can be changed via style (e.g., element.style.color = "red".

(4) Handling Events => Enables interaction through event listners (onclick on mouse.