Web Technology

Course Title: Web Technology (3 Cr.) **Course Code: CACS205**
Year/Semester: II/III
Class Load: 6 Hrs./Week (Theory: 3 Hrs, Practical:3 Hrs.)
Course Description:

This course covers different aspect of web technology such as HTML, CSS, and issues of web technology, client tier, server tier and advanced server side issue.

Course Objectives

The general objectives of this course are to provide fundamental concepts of Internet, Web Technology and Web Programming.

Course Content

Unit 1 HTML and CSS **15 Hrs.**

HTML Basic: HTML Tag Reference, Global Attributes, Document, Structure Tags, Formatting Tags, Text Level Formatting, Block Level foom1atting, List Tags, Hyperlink Tags. Executable Content Tags.

Image & Imagemaps: Introduction, Client-Side Imagemaps, Server-Side Imagemaps. Using Server-Side and Client-Side Imagempas Together, Alternative Text for Imagemaps.

Tables: Introduction To HTML Tables and Their Structure, The Table Tags, Alignment, Aligning Entire Table, Alignment within a Row, Alignment within a Cell, Attributes, Content Summary, Background Color, Adding Caption, Setting the Width, Adding a Border, Spacing Within a Cell, Spacing between the Cells, Spanning Multiple Rows or Columns, Elements that can be Placed in a Table, Table Sections and Column Properties, Tables as a Design Tool.

Frames: Introduction to Frames, Applications, Frames document, The <PRAMESET> tag, Nesting <FRAMESET> tag, Placing content in frames with the <FRAMEME>Tag, Targeting named Frames, Creating Floating Frames, Using Hidden Frames.

Forms: Creating Forms, the <FORM> tag, Named Input fields, The <INPUT> tag, multiple lines text windows, Drop Down and List Boxes, Hidden, Text, Text Area. Password, File Upload, Button, Submit, Reset, Radio, Checkbox, Select. Option, Forms and Scripting, Action Buttons, Labeling input files, Grouping related fields, Disabled and read-only fields, Form field event handlers, Passing form data.

Style Sheets: Definition, Importance, Different Approaches to Style Sheets. Using Multiple Approaches, Linking to Style Information in Separate File, Setting up Style Information, Using <STYLE> tag, Linline style Information.

Unit 2 Issue of Web Technology **3 Hrs.**

Architectural Issues of Web Layer. Tier Technology: 2-Tier, 3-Tier and n-Tier.

Unit 3 the Client Tier **10 Hrs.**

Representing Content; Introduction to XMT.; Elements and Attributes; Rules for Writing XML; Namespaces; Schema: Simple, Types and Complex Types, XSD Attributes, Default and Fixed Values, Facts, Use of Patterns, Order Indicators (AIL Choice, Sequences), Occurrence indicators (Maxoccurs, Minoccurs). DTD: Internal Declaration. Private External Declaration, Public External Declaration, Defining Elements and Attributes; XSL/XSLT; Xpath; Xquery; SAX; DOM. Creating XMT, Parser.

Unit 4 the Server Tier **8 Hrs.**

Web Server Concept; Creating Dynamic Content. Using Control Flow to Control Dynamic Content Generation, Sessions and State, Error Handling. Architecting Web Application Using Tag Libraries, Writing Tag Libraries.

Unit 5 Introduction to Advanced Server Side Issues **9Hrs.**

Database Connectivity; Creating an SQL statement: Select, Insert, Update and Delete; Authentication: Anonymous Access, Authentication by IP address and Domain, Integrated Windows Authentication; Cookies; File Handling; Form Handling

Laboratory Works

Laboratory works should be done covering all the topics listed above and a small project work should be carried out using the concept learnt in this course. Project should be assigned on individual basis.

Teaching Methods

The general teaching pedagogy includes class lecturer, group works, case studies, guest lectures, research work, and project work. Assignments (theoretical and practical), tutorials and examinations (written and verbal). The teaching faculty will determine the choice of teaching pedagogy as per the need of the topics.

Evaluation

Examination Scheme				
Internal Assessment		Internal Assessment		Total
Theory	Practical	Theory	Practical	
20		60 (3 Hrs.)	20 (3 Hrs)	100

Text Books

1. Harvey M. Deitel, Paul J. Deitel & Abbey Deitel, "Internet and World Wide Web: How to Program", 5th Edition, Pearson Education, 2012, ISBN: 9780273764021
2. Thomas A. Powell, "HTML & CSS: The Complete Reference", McGraw Hill, Fifth Edition, 2010, ISBN: 978-0-07-174170-5

Reference Books

1. Matt J. Crouch, "ASP.NET and VR.NET Web Programming", Pearson Education Asia, 2002.
2. Rahul Banerjee, "Internetworking Technologies", Prentice-Hall of India Limited, Fourth Edition, 2000.
3. Thomas A. Powell, "Web Design: The Complete Reference", Tata McGraw Hill, Second Edition, 2002.

TRIBHUVAN UNIVERSITY

Faculty of Humanities & Social Sciences

OFFICE OF THE DEAN

TU QUESTIONS-ANSWERS 2019

Bachelor in Computer Applications **Full Marks: 60**
Course Title: Web Technology **Pass Marks: 24**
Code No: CACS 205 **Time: 3 hours**
Semester: III

Candidates are required to answer the questions in their own words as far as possible.

Group A

Attempt all the questions. **[10x1 = 10]**

1. Circle (O) the correct answer.

i) Which of the following provide additional information about HTML elements?
a) Headings b) Paragraphs
c) Attributes d) Styles

ii) Which of the following is NOT an inline element?
a) <img> b)
c) <input> d) None of the above

iii) How can you make an e-mail link?
a) <a href="mailto:xxx@yyy"> b) <mail href="xxx@yyy ">
c) <mail>xxx@yyy </mail> d) <a href="xxx@yyy ">

iv) For XML document to be valid?
a) Document need to be well formed also
b) Document need not to be well formed
c) Document need to be well formed & valid
d) Document validity has no relationship with well formedness

v) W3C is stands for.....
a) World Wide Web Center b) World Wide Web Company
c) World Wide Web Consortium d) World Wide Web Certificate

vi) XSL is.....
a) AN XML based language to create style sheets
b) Extensible solution language
c) A language which is not used in XML
d) Extended style sheet language

vii) CSS uses dot (.) for.....
a) Element selector b) Class selector
c) ID selector d) Attribute selector

viii) Namespace in XML is used to,.....
a) Distinguishes one XML vocabulary from another
b) Provides the spaces into name
c) Querying language
d) Make duplicate of XML validation

ix) A cookie is often used to identify a.....
a) User b) Browser
c) Web page d) Client

x) Server side scripts are.....

a) Visible to the end user
b) Invisible to the end user
c) Defined to user
d) none

Answer-Key

i. (c)	ii. (b)	iii. (a)	iv. (d)	v. (c)	vi. (a)	vii. (b)	viii. (a)	ix. (a)	x. (b)

Group B

Attempt any SIX questions. **[6x5 = 30]**

2. What is CSS? Discuss types of CSS with example.

Ans: Cascading Style Sheet (CSS) is used to set the style in web pages which contain HTML elements. It sets the background color, font-size, font-family, color ... etc property of elements in a web page. There are three types of CSS which are given below:

a. Inline CSS
b. Internal or Embedded CSS
c. External CSS

Inline CSS

Inline CSS contains the CSS property in the body section attached with element is known as inline CSS. This kind of style is specified within an HTML tag using style attribute.

Example:

```
<!DOCTYPE html>
<html>
<head>
<title>Inline CSS</title>
</head>
<body>
<p style = "color:#009900; font-size:50px;
    font-style:italic; text-align:center;">
Web Technology
</p>
</body>
</html>
```

Internal or Embedded CSS

This can be used when a single HTML document must be styled uniquely. The CSS rule set should be within the HTML file in the head section i.e the CSS is embedded within the HTML file.

Example:

```
<!DOCTYPE html>
<html>
 <head>
<title>Internal CSS</title>
<style>
   .main {
      text-align:center;
   }
   .WT {
      color:#009900;
      font-size:50px;
```

```
        font-weight:bold;
    }
    .webt {
        font-style:bold;
        font-size:20px;
    }
    </style>
  </head>
  <body>
    <div class = "main">
      <div class ="WT">Web Technology</div>

      <div class ="webt">
        A computer science and BCA course
      </div>
    </div>
  </body>
</html>
```

External CSS

External CSS contains separate CSS file which contains only style property with the help of tag attributes (For example class, id, heading ... etc). CSS property written in a separate file with .css extension and should be linked to the HTML document using link tag. This means that for each element, style can be set only once and that will be applied across web pages.

Example: The file given below contains CSS property. This file saves with .css extension. For Ex: web.css

```
body {
background-color:powderblue;
}
.main {
text-align:center;
}
 .WT {
color:#009900;
font-size:50px;
font-weight:bold;
}
#webpro {
  font-style:bold;
font-size:20px;
}
```

Below is the HTML file that is making use of the created external style sheet

- LINK tag is used to link the external style sheet with the html webpage.
- HREF attribute is used to specify the location of the external style sheet file.

```
<! DOCTYPE html>
<HTML>
<HEAD>
<LINK rel="stylesheet" href="web.css"/>
```

```
</HEAD>
<BODY>
<DIV class = "main">
  <DIV class ="WT">Web technology</DIV>
  <DIV id ="web">
     A computer science and BCA course book
  </DIV>
</DIV>
</BODY>
</HTML>
```

3. What is XML? Differentiate XML schema with DTD.

Ans: Extensible Markup Language (XML) is a markup language that defines a set of rules for encoding documents in a format that is both human-readable and machine-readable. It is a textual data format with strong support via Unicode for different human languages.

Example

```
<?xml version="1.0" encoding="UTF-8"?>
<note>
<to>Tove</to>
<from>Jani</from>
<heading>Reminder</heading>
<body>XML example!</body>
</note>
```

Differences between an XML Schema Definition (XSD) and Document Type Definition (DTD) include:

- XML schemas are written in XML while DTD are derived from SGML syntax.
- XML schemas define data types for elements and attributes while DTD doesn't support data types.
- XML schemas allow support for namespaces while DTD does not.
- XML schemas define number and order of child elements, while DTD does not.
- XML schemas can be manipulated on your own with XML DOM but it is not possible in case of DTD.
- Using XML schema user need not to learn a new language but working with DTD is difficult for a user.
- XML schema provides secure data communication i.e. sender can describe the data in a way that receiver will understand, but in case of DTD data can be misunderstood by the receiver.
- XML schemas are extensible while DTD is not extensible.

4. List common application of web server, Explain how session works.

Ans: Web server is a computer where the web content is stored. Basically web server is used to host the web sites but there exists other web servers also such as gaming, storage, FTP, email etc. Web site is collection of web pages while web server is software that responds to the request for web resources. Examples of Web Servers are: Apache Tomcat and Resin.

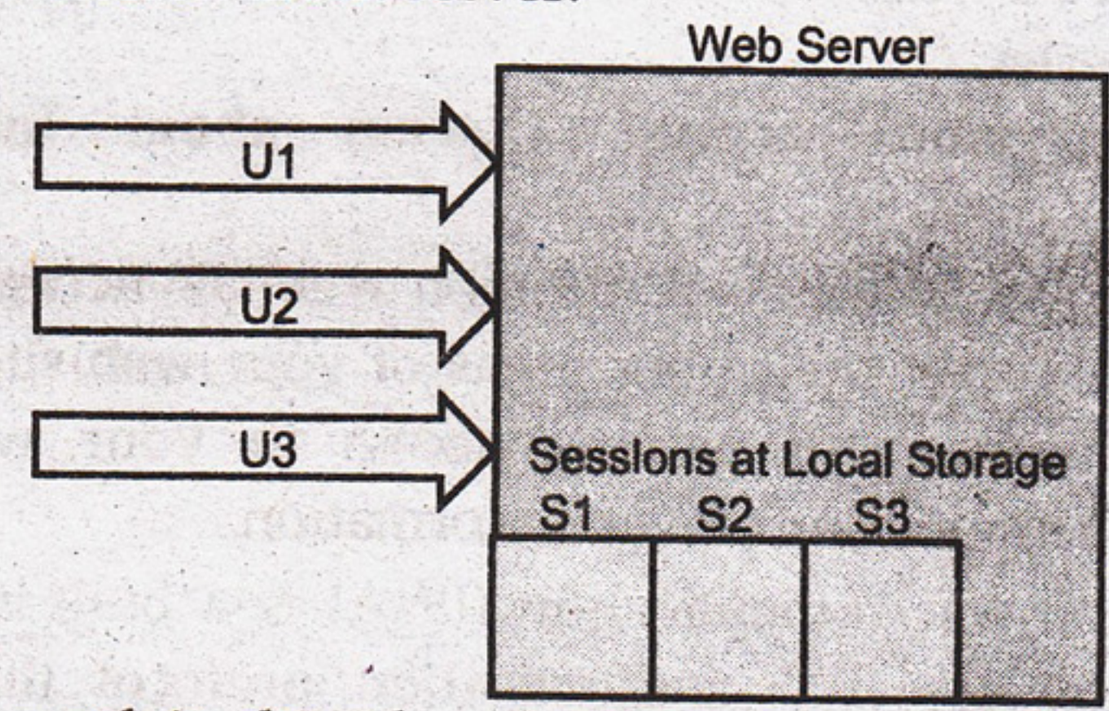
It can respond to the client request in either of the following two possible ways:

- Generating response by using the script and communicating with database.
- Sending file to the client associated with the requested URL.

Web servers often come as parts of a larger package of internet- and intranet-related programs that are used for:

- Sending and receiving emails.
- Downloading requests for File Transfer Protocol (FTP) files.
- Building and publishing Web pages.

Web developer may need to store small data temporarily at server side, for each user who is interacting with the web application. Such data is stored in a session, so session is a temporary storage at web server. For each user, there is unique session are at server.



Above picture explain this idea; there are 3 users i.e. U1, U2, U3 interacting with the web-server, so there are 3 sessions at server side, one for each user i.e. S1 for U1, S2 for U2 and S3 for U3.

If we save data in session for U1, it would be stored in S1 bucket or session. When we would get data for U1, it would be automatically read from S1 session. (Later I have explained how server keep track of which session bucket, belong to which user. In same way, data stored for U2 goes in S2, and so on.

5. Describe the tags and attributes for a form in HTML document?

Ans: HTML tags are the hidden keywords within a web page that define how your web browser must format and display the content. Most tags must have two parts, an opening and a closing part. For example, <html> is the opening tag and </html> is the closing tag. Note that the closing tag has the same text as the opening tag, but has an additional forward-slash (/) character. There are some tags that are an exception to this rule, and where a closing tag is not required. The <img> tag for showing images is one example of this. Each HTML file must have the essential tags for it to be valid, so that web browsers can understand it and display it correctly. The rest of the HTML file can contain as little or as many tags as you want to display your content.

Example:

```
<html>
 <head>
 <title>My Page Title</title>
 </head>
 <body>
 This is where all my web page content goes!
 </body>
</html>
```

Tag Attributes

Attributes allow us to customize a tag, and are defined within the opening tag, for example:

<img src="image1.jpg"> or ...

Attributes are often assigned a value using the equals sign, such as border="0" or width="50%", but there are some that only need to be declared in the tag like this:

<hr noshade>.

Most attributes are optional for most tags, and are only used when you want to change something about the default way a tag is displayed by the browser. However, some tags such as the <img> tag has required attributes such as src and alt which are needed in order for the browser to display the web page properly.

6. What is anonymous access? Discuss about Integrated windows authentication.

Ans: Anonymous access is the most common web site access control method. It allows anyone to visit the public areas of your web sites while preventing unauthorized users from gaining access to your web server's critical administrative features and private information.

Integrated Windows Authentication (IWA) is a built-in Microsoft Internet Information Services (IIS) authentication protocol that can be used to automatically authenticate and sign-in a user to EMS Web App. Integrated Windows Authentication works only with Internet Explorer and is best used on intranets where all clients accessing EMS Web App are within a single domain. When a domain user who is logged on to a networked PC accesses an EMS Everyday User application, such as EMS Web App, EMS Mobile App, or EMS for Outlook, their Active Directory credentials (Domain\User ID) are compared against corresponding Domain\User ID information recorded in the Network ID and\or External Reference fields of your EMS Everyday User records. If a match exists, the Everyday User will be automatically logged in.

Configuring Integrated Windows Authentication

1. Go to Configure > My Proxy > Basic > General. In the Authentication section, click Integrated Windows Authentication On, and click Apply.
2. Configure the Global authentication options.
3. Join the Windows domain.

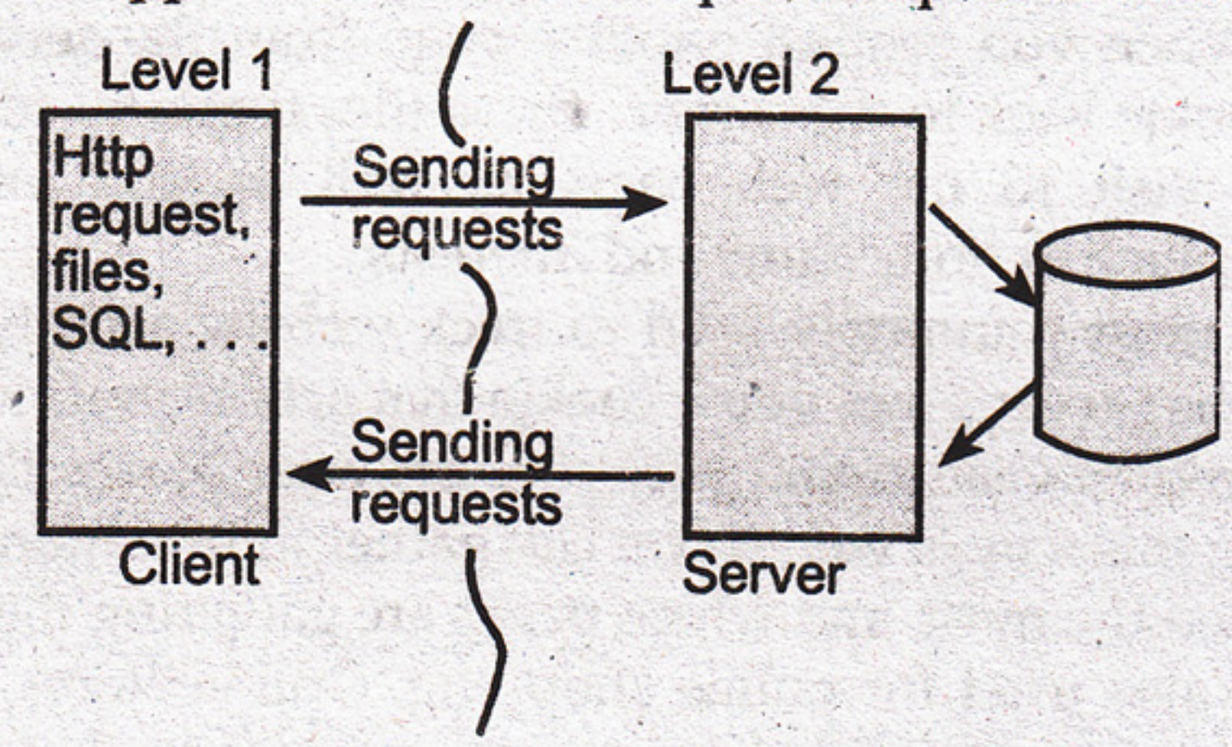
To join the domain:

- Content Gateway must be able to resolve the domain name.
- Content Gateway system time must be synchronized with the domain controller's time, plus or minus 1 minute.
- The correct domain Administrator name and password must be specified.
- There must be TCP/UDP connectivity to the domain controller(s) (ports 88, 389, 445).
- If backup domain controllers are configured, they and their Kerberos Distribution Center (KDC) services must be reachable by Content Gateway on the network.

7. Explain tire technology with examples?

Ans: Multitier architecture or multilayered architecture is client–server architecture in which presentation, application processing, and data management functions are physically separated. The most widespread use of multitier architecture is the three-tier architecture.

2-Tier Architecture: 2-tier architecture is used to describe client/server systems where the client requests resources and the server responds directly to the request, using its own resources. This means that the server does not call on another application in order to provide part of the service.

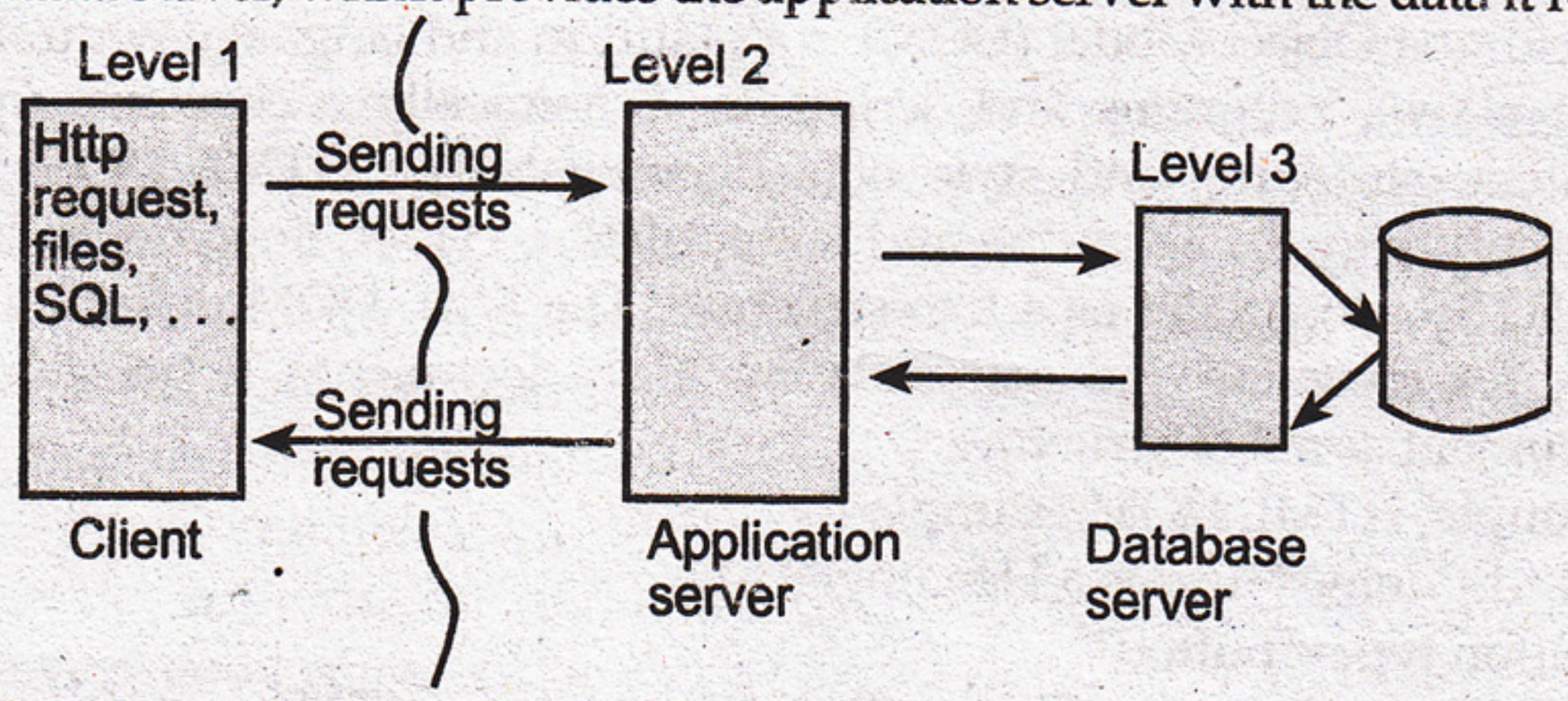


3-Tier Architecture: In 3-tier architecture, there is an intermediary level, meaning the architecture is generally split up between:

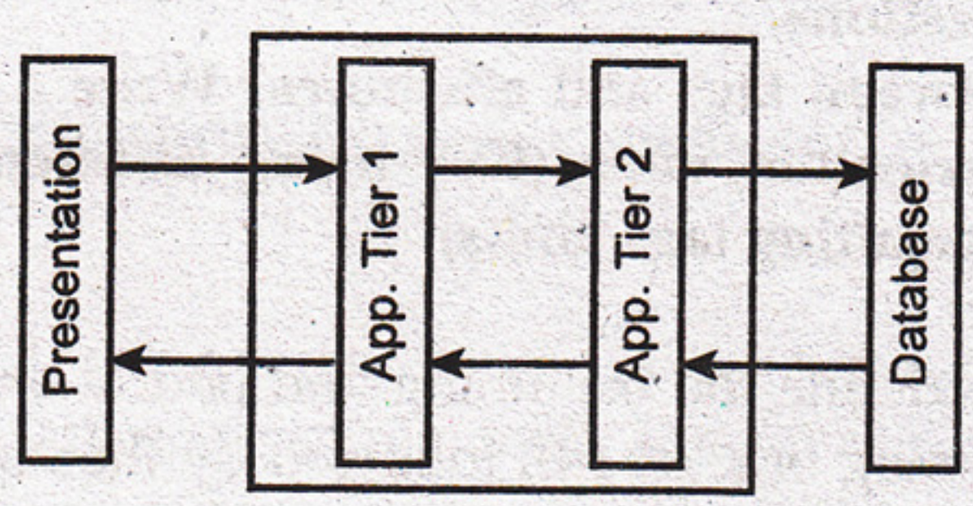
A client, i.e. the computer, which requests the resources, equipped with a user interface (usually a web browser) for presentation purposes

The application server (also called middleware), whose task it is to provide the requested resources, but by calling on another server

The data server, which provides the application server with the data it requires



An N-tier architecture (with N more than 3) is really 3 tier architectures in which the middle tier is split up into new tiers. The application tier is broken down into separate parts. What these parts are differs from system to system. The following picture shows it:



The primary advantage of N-tier architectures is that they make load balancing possible. Since the application logic is distributed between several servers, processing can then be more evenly distributed among those servers.

N-tiered architectures are also more easily scalable, since only servers experiencing high demand, such as the application server, need be upgraded. The primary disadvantage of N-tier architectures is that it is also more difficult to program and test an N-tier architecture due to its increased complexity.

8. **Write short note on following:**

- **Cookies**

Ans: Cookies are messages that web servers pass to your web browser when you visit Internet sites. Your browser stores each message in a small file, called cookie.txt. When you request another page from the server, your browser sends the cookie back to the server. These files typically contain information about your visit to the web page, as well as any information you've volunteered, such as your name and interests.

Cookies are most commonly used to track website activity. When you visit some sites, the server gives you a cookie that acts as your identification card. Upon each return visit to that site, your browser passes that cookie back to the server. In this way, a web server can gather information about which web pages are used the most, and which pages are gathering the most repeat hits. Cookies are also used for online shopping. Online stores often use cookies that record any personal information you enter, as well as any items in your electronic shopping cart, so that you don't need to re-enter this information each time you visit the site.

Servers can use cookies to provide personalized web pages. When you select preferences at a site that uses this option, the server places the information in a cookie. When you return, the server uses the information in the cookie to create a customized page for you.

- **XML DOM**

Ans: Document Object Model (DOM) is a platform and language-neutral interface that allows programs and scripts to dynamically access and update the content, structure, and style of a document. The HTML DOM defines a standard way for accessing and manipulating HTML documents. It presents an HTML document as a tree-structure. The XML DOM defines a standard way for accessing and manipulating XML documents. It presents an XML document as a tree-structure.

Example: HTML DOM example

```
<h1 id="demo">this is a Heading</h1>
<button type="button"
onclick="document.getElementById('demo').innerHTML = 'Hello
World!'">Click Me!
</button>
```

Group C

Attempt any TWO questions. **[2x10 = 20]**

9. **Differentiate between tags and attributes? Write a HTML and CSS code design your curriculum vitae (CV) using different html elements like (table, image, formatting tags, links).**

Ans: **HTML Tags**

Tags are used to define the beginning and end of an HTML element. They consist of an opening bracket (<), followed by the name of the element and then a closing bracket (>). If an attribute is being used in the tag, it will be included after the element. Here's an example of the HTML title tag:

<title> <title>

HTML Attributes

Attributes are used to define a property for one or more HTML elements. They are found within the element's opening tag, often containing spaces that are separated by value pairs.

Here's an example of the HTML alt text attribute:

<img src="dogs-playing.gif" alt="dogs playing outside">

In this example, the HTML attribute is an alt text of "dogs playing outside" for the image "dogs-playing.gif." While images will typically render and display regardless of whether or not they contain alt text, adding this attribute is beneficial for several different reasons.

HTML

```
<html>
 <head>
<title></title>
</head>
<body>
<div id="header">
 <p id="name">Deep Laxman Karki</p>
<a href="mailto:deepsukhwani@gmail.com" target="_blank"><p
id="email">deepsukhwani@gmail.com</p></a>
</div>
<div class="left">
</div>
<div class="right">
 <h3>CV Highlights</h3>
 <p>
 <ul>
<li>Currently going through CS253 - Web Application Engineering and
CS61A - Structure & Interpretation of Computer Programs</li>
<li>Learnt basic Python, JavaScript, HTML, CSS on Codecademy.com. </li>
<li>An independent, dedicated, efficient person. These attributes are proved
through the series of courses I have taken or I am taking as of now
independently through online platforms. </li>
<li>Good Communication Skills, Presentation Skills, attitude towards
leadership, authorisation and delegation, conflict resolution and negotiation
and a very good team worker.</li></ul>
 </p>
 <h3>Professional Experience</h3>
 <h4 id="company-name">Wingify Software Pvt Ltd</h4>
<pid="job-title"><strong>Support Engineer (Technical Support)</strong>
</p>
 <p id="job-responsibilities">Job Responsbilities</p>
 <p>
 <ul>
    <li>Answer customer queries over email / ticketing system</li>
<li>Interact with our engineering team to get software issues and bugs
resolved</li>
    <li>Occasionally interact with customers over Skype or telephone</li>
```

```
<li>Contribute ideas to the team on how customers can be delighted</li></ul>
 </p>
 <h3>Educational Qualifications</h3>
 <table>
   <tr id="heading">
     <td>Qualification</td>
     <td>Board</td>
     <td>Percentage / Grades</td>
     <td>Year</td>
   </tr>
   <tr>
     <td>S.S.C</td>
     <td>B.Sc. CSIT</td>
     <td>85.57%</td>
     <td>2019</td>
   </tr>
   <tr>
     <td>H.S.C (Science Stream)</td>
     <td>TU Nepal</td>
     <td>72.40%</td>
     <td>2018</td>
   </tr>
   <tr>
     <td>GDCA (Grad. Dipl in Computer Applications)</td>
     <td>NIE (National Institute Of Engineering), Mumbai, India</td>
     <td>A Grade</td>
     <td>2008</td>
   </tr>
   <tr>
     <td>B.Sc. (Hons) - Applied Accounting</td>
     <td>Oxford Brookes University</td>
     <td>2:1 – Upper Second Class Honours</td>
     <td>2012</td>
   </tr>
   <tr>
     <td>Chartered Accounting - ACCA</td>
     <td>ACCA Glasgow, UK</td>
     <td>Passed (1st Attempt)</td>
     <td>2013</td>
   </tr>
 </table>
 <h3>Independent Courses</h3>
 <p>
 <ul>
   <li>
<span id="course-name">HTML & CSS for Beginners – Web Fundamentals</span> – Codecademy.com</li>
   <li>
```

Python - Fundamentals and Dynamic Programming - Codecademy.com</li>
<li>
JavaScript – Programming Basics, JS Apps and Build Games - Codecademy.com</li>
<li>
CS101: Introduction to Computer Science - Building a Web Crawler - Udacity.com</li>
<li>
CS50x – Introduction to Computer Science I – edX.org & Harvard University</li>
<li>
Calculus One - Ohio State University & Coursera.org </li>
<li>
Introduction to Finance - Coursera.org & University of Michigan</li>
</ul>
<h3>Technical Skills</h3>

<ul>
<li>
Operating Systems: DOS, Windows 98, Windows 2000, Windows XP, Windows NT, Windows Server 2003, Windows Vista, Windows 7, Macintosh Computers (OS X), Linux (Ubuntu, Fedora)</li>
<li>
Application Software: Office 97-2003; Office XP, Office 2007, Office for Mac 2011, iWork '09, Sage Accounting Software, Sage 50 (Accounting Software), Excel 2003/2007 for Financial Modelling spreadsheets.</li>
<li>
Programming Skills:HTML, CSS, Python, JavaScript, learning C and C++</li></ul>

<h3>Certifications / Awards:</h3>

<ul>
<li>Scored highest in ACCA P1 – Governance, Risk & Ethics exam – June 2012 session amongst full time international students at Kaplan Financial, London.</li>
<li>Interviewed by ACCA for "international ACCA student in UK", interview published in January 2012 edition of ACCA Student Accountant Magazine.</li>
<li>Interviewed by ACCA for "international ACCA student in UK", interview published in January 2012 edition of ACCA Student Accountant Magazine.</li></ul>

<h3>Personal Information :</h3>

```
<p>
<ul>
  <li>
A young, determined hard and smart working person. I believe in task based roles and complete ownership of work.
  <li>
<span id="course-name">Languages Known :</span>English, Hindi, Gujarati and Sindhi</li>
  <li>
<span id="course-name">Hobbies:</span>I love reading Finance and IT related books / magazines, playing Chess, swimming, listening music, surfing Internet, self-learning through e-courses.</li> </ul>
</p>
<h3>Other Information</h3>
<p>
<ul>
  <li>
  <span id="course-name">Expected Salary :</span>As per company standards</li>
  <li>
  <span id="course-name">Area of Interest:</span>Software Development, Programming, Start-ups, Coding, App Development, Technical Support, Support Engineer, Customer Happiness, Client service, Investment Banking, Corporate Finance, Hedge Funds, Mergers & Acquisitions, Analyst, Equity Research, Business Analysis</li>
<li>
<span id="course-name">Joining Date :</span>Immediate</li></ul>
</p>
<h3>Declaration</h3>
<p>
I hereby declare that the details furnished above are true and correct to the best of my knowledge and belief.</p>
</div>
<div id="footer"></div>
</body>
</html>
```

CSS

```
div
{
border-radius: 5px;
}
#header
{
position: fixed;
z-index: 1;
height:40px;
width: 98%;
background-color: #668284;
margin-bottom: 10px
}
```

```
    #name {
float:left;
    margin-left: 20px;
    padding-bottom: 10px;
    font-size: 16px;
    font-family: Verdana, sans-serif;
    color: #ffffff;
    }
    #email{
float:right;
margin-right: 20px;
    padding-bottom: 10px;
    font-size: 16px;
    font-family: Verdana, sans-serif;
    color: #ffffff;
    }
    a:hover {
    font-weight: bold;
    }
    .right
    {
float: left;
margin-top: 50px;
  padding-left:5px;
  margin-left: 14%;*/
  height: auto;
  width: 99%;
  background-color: #E3EDD8;
  }
#footer
{
  height:40px;
  clear:both;
  position: relative;
  background-color: #C1E3E1;
  }
h3
{
  text-decoration: underline;
  }
#job-responsibilities
{
  padding: 1px;
  }
```

```
.job-title
{
  .font-weight: bold;
   }
table
{
   border: 1px dashed black;
   }
td
{
   padding: 2px;
   border: 1px solid #E88741;
   }
#course-name
{
   font-weight:bold;
   }
#company-name
{
   height:2px;
   text-decoration:underline;
   }
#job-title
{
   height: 5px;
   }
.job-duration
{
   float:right;
   }
#heading
{
   font-weight:bold;
   }
```

10. Develop a simple web page that asks the users input (name, email, phone, gender) and store into database using server side script.

Ans:

```
<html>
<head>
<title>PHP User Registration Form</title>
<link href="./css/style.css" rel="stylesheet" type="text/css" />
</head>
<body>
<form name="frmRegistration" method="post" action="">
  <div class="demo-table">
  <div class="form-head">Sign Up</div>
   <?php
  if (! empty($errorMessage) && is_array($errorMessage))
  {?>
   <div class="error-message">
    <?php
```

```
 foreach($errorMessage as $message)
{
    echo $message . "<br/>";
 }
?>
</div>
<?php
}
?>
 <div class="field-column">
    <label>Username</label>
    <div>
       <input type="text" class="demo-input-box"
          name="userName"
  value="<?php  if(isset($_POST['userName'])) echo $_POST ['userName'];
?>">
    </div>
  </div>

  <div class="field-column">
    <label>Email</label>
    <div>
       <input type="text" class="demo-input-box"
          name="userEmail"
   value="<?php  if(isset($_POST['userEmail'])) echo $_POST ['userEmail'];
?>">
    </div>
 </div>
<div class="field-column">
    <label>Phone</label>
<div><input type="phone" class="demo-input-box" name="phone" value=""
</div>
 </div>
 <div class="field-column">
    <label>Gender</label>
    <div>
       <input type="gender" class="demo-input-box"
          name="gender" value="">
    </div>
 </div>
 <div class="field-column">
    <div class="terms">
       <input type="checkbox" name="terms"> I accept terms
       and conditions
    </div>
    <div>
       <input type="submit"
          name="register-user" value="Register"
          class="btnRegister">
```

```
            </div>
        </div>
    </div>
  </form>
</body>
</html>
```

And the styles are,

```
body {
    font-family: Arial;
    color: #333;
    font-size: 0.95em;
}
.form-head {
    color: #191919;
    font-weight: normal;
    font-weight: 400;
    margin: 0;
    text-align: center;
    font-size: 1.8em;
}
.error-message {
    padding: 7px 10px;
    background: #fff1f2;
    border: #ffd5da 1px solid;
    color: #d6001c;
    border-radius: 4px;
    margin: 30px 0px 10px 0px;
}
.success-message {
    padding: 7px 10px;
    background: #cae0c4;
    border: #c3d0b5 1px solid;
    color: #027506;
    border-radius: 4px;
    margin: 30px 0px 10px 0px;
}
.demo-table {
    background: #ffffff;
    border-spacing: initial;
    margin: 15px auto;
    word-break: break-word;
    table-layout: auto;
    line-height: 1.8em;
    color: #333;
    border-radius: 4px;
    padding: 20px 40px;
    width: 380px;
    border: 1px solid;
    border-color: #e5e6e9 #dfe0e4 #d0d1d5;
}
```

```
.demo-table .label {
   color: #888888;
}
.demo-table .field-column {
   padding: 15px 0px;
}
.demo-input-box {
   padding: 13px;
   border: #CCC 1px solid;
   border-radius: 4px;
   width: 100%;
}
.btnRegister {
   padding: 13px;
   background-color: #5d9cec;
   color: #f5f7fa;
   cursor: pointer;
   border-radius: 4px;
   width: 100%;
   border: #5791da 1px solid;
   font-size: 1.1em;
}
.response-text {
   max-width: 380px;
   font-size: 1.5em;
   text-align: center;
   background: #fff3de;
   padding: 42px;
   border-radius: 3px;
   border: #f5e9d4 1px solid;
   font-family: arial;
   line-height: 34px;
   margin: 15px auto;
}
.terms {
   margin-bottom: 5px;
}
```

11. What are the rules for creating XML document? Write a XML code to store following information about student.

- Each student has a name, address, phone and website element.
- Address might appears multiple times
- Address has attribute named "type" with value permanent and temporary phone must be 10 digits.

Ans: Rules for creating XML document are listed below

- All xml must have a root element
- All tags must be closed
- All tags must be properly nested
- Tag names have strict limits
- Tag names are case sensitive
- Tag names cannot contain spaces
- Attribute values must appear within quotes

- White space is preserved
- Avoid html tags

XML code

Student.xml

```
<?xml version="1.0"?>
<student_info xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
      xsi:noNamespaceSchemaLocation="xsfile.xsd">
   <student>
      <name>Bhupendra</name>
      <address type="permanent">Doti-1</address>
      <address type="temporary">KTM-1</address>
      <phone>234</phone>
      <website>bhupendra.com</website>
   </student>
</student_info>
```

xsfile.xsd

```
<xs:schema xmlns:xs="http://www.w3.org/2001/XMLSchema">
<xs:element name="phone">
 <xs:simpleType>
   <xs:restriction base="xs:string">
     <xs:minLength value="10" />
   </xs:restriction>
 </xs:simpleType>
</xs:element>
</xs:schema>
```

TRIBHUVAN UNIVERSITY

Faculty of Humanities & Social Sciences

OFFICE OF THE DEAN

TU QUESTIONS-ANSWERS 2020

Bachelor in Computer Applications **Full Marks: 60**
Course Title: Web Technology **Pass Marks: 24**
Code No: CACS 205 **Time: 3 hours**
Semester: III

Candidates are required to answer the questions in their own words as far as possible.

Group A

Attempt all the questions. **[10x1 = 10]**

i. Which of the following is not a pair tag?
   a) <p> b) <i>
   c) <title> d) <img>

ii. When should you use a path along with file name of a picture is an IMG tag?
   a) path is optional and not necessary
   b) when the location of image file and html file are different
   c) when image file and html file both are on same location
   d) path is always necessary when inserting image

iii. Which CSS property will be used if we doesn't want to allow following div to left side of the element?
   a) margin b) clear
   c) float d) Padding

iv. The most prevalent to materialize XML documents is to utilize.....
   a) DTD b) HTML
   c) XSLT d) SOAP

v. .....are serious error that require attention but don't stop script to execute.
   a) Fatal errors b) Notice
   c) Warnings d) Error Report Level

vi. Which of the following explain colder nature?
   a) Nonvolatile b) Volatile
   c) Intranet d) transient

vii. Which one of the following is the very first task executed by a session enabled page?
   a) delete the previous session
   b) start a new session
   c) check whether a valid session exists
   d) handle the session

viii. Which of the following XPath expression select the parents of current node?
   a) . b) ..
   c) / d) //

ix. Which of the following statement is not true about XML schema?
   a) they are used to define the content and structure of data.
   b) they have their own syntax.
   c) they define a set of symbols and the relationships of those symbols.
   d) they are themselves xml documents.

x. DOM represents a web page in.....
   a) Hash table structure
   b) Tree structure
   c) Dynamic structure
   d) Recursive structure

Answer Key

i. (d)	ii. (b)	iii. (b)	iv. (c)	v. (a)	vi. (d)	vii. (c)	viii. (b)	ix. (b)	x. (b)

Group B

Attempt any SIX questions. **[6x5 = 30]**

2. What is HTML 5? Explain characteristics of HTML 5.

Ans: HTML5 is the 5th version or update of HTML. This is the most advanced HTML programming. In this version lot of tags were added to make the designer's life easier.

HTML5 Features

The following are the features of HTML5 that make it a popular language for website development.

1. **Nav Tag:** The <nav> tag helps in defining a set of navigation links. It helps create a section of a website that contains navigation links (within the current document or to another document). A few examples of navigation links are the table of contents and indexes.

   Example of Nav Tag

```
<!DOCTYPE html>
<html>
<body>
  <h1>Example of HTML nav Tag</h1>
  <h2>Online Programming Courses</h2>
  <nav>
    <a href="#">HTML</a> |
    <a href="#">CSS</a> |
    <a href="#">JavaScript</a> |
    <a href="#">Python</a>
  </nav>
</body>
</html>
```

2. **Audio & Video Tags:** With Audio and Video tags, developers can embed videos or audio into their websites. For styling the video tag, developers can use CSS and CSS3.

   Example of the video tag in HTML

```
<!DOCTYPE html>
<html>
<body>
<video width="400px" height="300px" controls>
 <source src=" movie.mp4 " type="video/mp4">
</video>
</body>
</html>
```

3. **Header:** The <header> element in HTML5 contains introductory content. It can include a set of introductory or navigational support on a

website. Typically, the header element contains heading elements, logo or icons, a search form, author's information, etc.

Example of header element in HTML5

```
<!DOCTYPE html>
<html>
<body>
  <h1>Nsc Learning</h1>
  <h3> Find courses that are the best for your career </h3>
    <header>
    <a href=
"https://www.nsc.com/learning/technology-courses-certification-training-ct139">
    Technology</a> |
    <a href=
"https://www.nsc.com/learning/data-science-courses-certification-training-ct123">
    Data Science</a> |
    <a href=
"https://www.nsc.com/learning/management-courses-certification-training-ct135">
    Management</a> |
    <a href=
"https://www.nsc.com/learning/articles/">
    Blog</a> |
  </header>
</body>
</html>
```

4. **Footer:** The <footer> tag defines the footer of a document or a section. Typically, the footer contains information related to the author, copyright, contact information, sitemap, related documents, back to top links, etc. There can be more than one footer element in one document.

   Example of the footer in HTML5

```
<!DOCTYPE html>
<html>
  <body>
      <footer>
      <p>Posted by: Deepali Sharma</p>
     <p>Contact information: <a href="mailto:deepali@example.com">
      deepali@example.com</a>.</p>
    </footer>
  </body>
</html>
```

5. **Figure and figcaption:** These elements help users to insert an image with its caption. The fig. caption tag is used to add a description for the image.

   Example of Figcaption

```
<!DOCTYPE html>
<html>
<body>
```

```
<figure>
  <img src="red tulips.jpg"
    alt="Red Tulips">
  <figcaption>Red Tulips in a Garden</figcaption>
</figure>
</body>
</html>
```

6. **Canvas Tag:** The canvas tag in HTML5 helps users draw graphics or images on the fly using JavaScript. We can use it for drawing paths, boxes, circles, adding images, etc. The canvas tag has two attributes: width and height for setting the width and height of the canvas.

   Example of canvas tag in HTML5

```
<! DOCTYPE html>
<html>
  <body>
    <canvas id="Canvas1" width="400" height="100" style="border: 2px
    solid ;">
    </canvas>
  </body>
</html>
```

7. **Mark:** The <mark> element highlights a particular text that is of special interest to the user in an HTML document.

   Example of the mark element

```
<! DOCTYPE html>
<html>
    <body>
      <p> Grow your skillset with <mark>Nsc Learning.</mark> Find
the <mark>best online courses</mark> and certifications in
management, technology, programming, and data science.</p>
    </body>
</html>
```

8. **Main Tag:** This tag defines the important content of the <body> of a document.

   Example of Main Tag

```
<! DOCTYPE html>
<html>
  <body>
    <header>
      <p>Header content</p>
    </header>
   <main>
    <p>Main Content</p>
    <h2>Nsc Learning</h2>
    <p> Find courses that are best for your career </p>
   </main>
   </body>
</html>
```

9. **Progress Tag:** The progress tag helps users check the progress of a task during the execution. Users will need to define the dynamically changing values of the progress bar with the scripts (JavaScript).

Example of progress tag in HTML5

```
<!DOCTYPE html>
<html>
 <body>
  <span>Loading:</span>
  <progress value="55" max="100"></progress>
 </body>
</html>
```

10. **Section Tag:** The <section> element defines specific sections and subsections in the document.

Example of Section in HTML5

```
<! DOCTYPE html>
<html>
  <body>
    <section>
      <h1>Section 1</h1>
 <p>Section 1 content</p>
    </section>
    <section>
      <h1>Section 2</h1>
<p>Section 2 content</p>
    </section>
  </body>
</html>
```

3. **Write HTML tag to generate the following table.**

	Average		Red Eyes
Males	**1.5**	**0.004**	**45%**
Females	**1.4**	**0.006**	**47%**

Ans:

```
<! DOCTYPE html>
<html>
<style>
table, th, td {
 border:1px solid black;
}
</style>
<body>
<TABLE border="1">
<TR><TH rowspan="2"><TH colspan="2">Average
  <TH rowspan="2">Red<BR>Eyes
<TR><TH>Height<TH>Weight
<TR><TH>Males<TD>1.5<TD>0.004<TD>45%
<TR><TH>Females<TD>1.4<TD>0.006<TD>47%
</TABLE>
```

4. Design the following website's Menu with use of HTML list and appropriate CSS.

HOME | NEWS | CONTACT | ABOUT

Ans:
```
<! DOCTYPE html>
<html>
<head>
<style>
ul {
 List-style-type: none;
 margin: 0;
 padding: 0;
}
</style>
</head>
<body>
<p>in this example, we remove the bullets from the list, and its default
      padding and margin. </p>

<ul>
 <li><a href="#home">Home</a></li>
 <li><a href="#news">News</a></li>
 <li><a href="#contact">Contact</a></li>
 <li><a href="#about">About</a></li>
</ul>
</body>
</html>
```

5. Compare and contrast between block level and inline elements in HTML.

Ans: Block Elements

Block elements begin from a new line by default and cover space to its left and right as far as it can go. The height that it covers is equal to the content height. Also, it covers the whole horizontal space of its parent element.

Example

```
<div style="border: 1px solid black ;"> About Us </div>
```

Inline Elements

Inline elements never start from a new line and only cover the width according to the size of bounded tags in the HTML element.

Example

```
<! DOCTYPE html>
<html>
 <body>
  <p>Hello, <span style="border: 1px solid black">Long time no
      see</span>.</p>
  <p>Inline element example</p>
 </body>
</html>
```

6. What is CSS Selector? Explain different types of selector with suitable example.

Ans: A CSS selector selects the HTML element for styling purpose. CSS selectors select HTML elements according to its id, class, type, attribute etc.

There are many basic different types of selectors.

- Element Selector
- Id Selector
- Class Selector
- Universal Selector
- Group Selector
- Attribute Selector

1. **Element selector:** The element selector selects HTML elements based on the element name (or tag) for example p, h1, div, span, etc.
   style.css: The following code is used in the above HTML code. You can see the CSS rules applied to all <p> tags and <h1> tags.

```
h1 {
   color: red;
   font-size: 3rem;
}
p {
   color: white;
   background-color: gray;
}
```

2. **Id selector:** The id selector uses the id attribute of an *HTML element* to select a specific element.
   style.css: The following code is used in the above HTML code using id selector.

```
#div-container{
   color: blue;
   background-color: gray;
}
```

3. **Class-selector:** The class selector selects HTML elements with a specific class attribute.
   style.css: The following code is used in the above HTML code using the class selector. To use class selector you must use (.) followed by class name in CSS. This rule will be applied to the HTML element with the class attribute "paragraph-class"

```
.paragraph-class {
   color:white;
   font-family: monospace;
   background-color: purple;
}
```

4. **Universal-selector:** The Universal selector (*) in CSS is used to select all the elements in a HTML document. It also includes other elements which are inside under another element.
   style.css: The following code is used in the above HTML code using the universal selector. This CSS rule will be applied to each and every HTML element on the page:

```
* {
  color: white;
  background-color: black;
}
```

5. **Group-selector**: This selector is used to style all comma separated elements with the same style.
style.css: The following code is used in the above HTML code using the group selector. Suppose you want to apply common styles to different selectors, instead of writing rules separately you can write them in groups as shown below.

```
#div-container, .paragraph-class, h1{
   color: white;
   background-color: purple;
   font-family: monospace;
}
```

6. **Attribute Selector:** The attribute selector [attribute] is used to select the elements with a specified attribute or attribute value.
style.css: The following code is used in the above HTML code using the attribute selector. This CSS rule will applied to each and every HTML element on the page:

```
[href] {Background-color: lightgreen;
  color: black;
  font-family: monospace;
  font-size: 1rem;
  }
```

All CSS Simple Selectors

Selector	Example	Example description
#id	#firstname	Selects the element with id="firstname"
.class	.intro	Selects all elements with class="intro"
element.class	p.intro	Selects only <p> elements with class="intro"
*	*	Selects all elements
element	p	Selects all <p> elements
element,element,..	div, p	Selects all elements and all <p> elements

7. Why session is required in web development? Explain how you set and remove values stored in Session with suitable example?

Ans: A session is a way to store information (in variables) to be used across multiple pages. Unlike a cookie, the information is not stored on the user's computer rather session is stored in server.
When you work with an application, you open it, do some changes, and then you close it. This is much like a Session. The computer knows who you are. It knows when you start the application and when you end. But on the internet there is one problem: the web server does not know who you are or what you do, because the HTTP address doesn't maintain state. Session variables solve this problem by storing user information to be used across multiple pages (e.g. username, favorite color, etc.). By default, session variables last until the user closes the browser. So; Session variables hold information about one single user, and are available to all pages in one application.

Uses of session

- Carrying information as a client travels between pages.
- One page data can be stored in session variable and that data can be accessed from other pages.

- Session can help to uniquely identify each client from another
- Session is mostly used in ecommerce sites where there is shopping cart system.
- It helps maintain user state and data all over the application.
- It is easy to implement and we can store any kind of object.
- Stores client data separately.
- Session is secure and transparent from the user.

Example:

Start a PHP session

PHP session_start() function is used to start the session. It starts a new or resumes existing session. It returns existing session if session is created already. If session is not available, it creates and returns new session.

E.g.

```
<?php
// Start the session
session_start();
?>
<!DOCTYPE html>
<html>
<body>
<?php
// Set session variables
$_SESSION["favcolor"] = "green";
$_SESSION["favanimal"] = "cat";
echo "Session variables are set.";
?>
</body>
</html>
```

GET PHP session variables values

```
<?php
session_start();
?>
<!DOCTYPE html>
<html>
<body>
<?php
// Echo session variables that were set on previous example
echo "Favorite color is " . $_SESSION["favcolor"] . ".<br>";
echo "Favorite animal is " . $_SESSION["favanimal"] . ".";
?>
</body>
</html>
```

i. **Critically analysis the pitfall of the 3-tier technology in comparison with n-tier technology.**

Ans: **3-Tier Architecture**

In 3-tier architecture, there is an intermediary level, meaning the architecture is generally split up between:

A client, i.e. the computer, which requests the resources, equipped with a user interface (usually a web browser) for presentation purposes

The application server (also called middleware), whose task it is to provide the requested resources, but by calling on another server

The data server, which provides the application server with the data it requires.

N-Tier Architecture (multi-tier)

N-tier architecture (with N more than 3) is really 3 tier architectures in which the middle tier is split up into new tiers. The application tier is broken down into separate parts. These parts are differs from system to system. The primary advantage of N-tier architectures is that they make load balancing possible. Since the application logic is distributed between several servers, processing can then be more evenly distributed among those servers. N-tiered architectures are also more easily scalable, since only servers experiencing high demand, such as the application server, need be upgraded. The primary disadvantage of N-tier architectures is that it is also more difficult to program and test an N-tier architecture due to its increased complexity.

Disadvantages of Three-Tier Architecture:

- It is more complex than the 2-tier client-server computing model, because it is more difficult to build a 3-tier application compared to a 2-tier application. The points of communication are doubled.
- The client does not maintain a persistent database connection.
- A separate proxy server may be required.
- Network traffic will be increased if a separate proxy server is used.
- The physical separation of application servers containing business logic functions and database servers containing databases may be something that affects performance.
- Improve complexity or effort.

Group C

Attempt any TWO questions. **[2 × 10 = 20]**

9. Design the following layout of webpage with use of div and appropriate CSS **[10]**

<table>
<tr><td colspan="2">Log</td></tr>
<tr><td colspan="2">Navigation</td></tr>
<tr><td colspan="2">Header Banner</td></tr>
<tr><td>Side Bar</td><td>Body Area</td></tr>
<tr><td colspan="2">Footer</td></tr>
</table>

Ans:

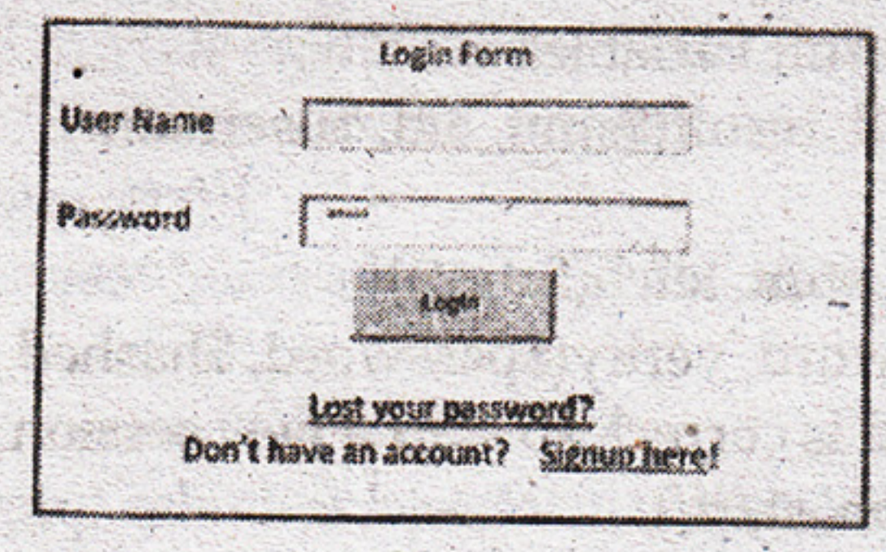
```
<!DOCTYPE html>
<html>
<head>
<style>
* {
  box-sizing: border-box;
}
body {
  font-family: Arial;
  padding: 10px;
  background: #f1f1f1;
}
```

```
/* Header/Blog Title */
.header {
  padding: 30px;
  text-align: center;
  background: white;
}
.header h1 {
  font-size: 50px;
}
/* Style the top navigation bar */
.topnav {
  overflow: hidden;
  background-color: #333;
}
/* Style the topnav links */
.topnav a {
  float: left;
  display: block;
  color: #f2f2f2;
  text-align: center;
  padding: 14px 16px;
  text-decoration: none;
}
/* Change color on hover */
.topnav a:hover {
  background-color: #ddd;
  color: black;
}
/* create two unequal columns that floats next to each other */
/* Left column */
.leftcolumn {
  float: left;
  width: 75%;
}
/* Right column */
.rightcolumn {
  float: left;
  width: 25%;
  background-color: #f1f1f1;
  padding-left: 20px;
}
/* Fake image */
.fakeimg {
  background-color: #aaa;
  width: 100%;
  padding: 20px;
}
```

```
/* Add a card effect for articles */
.card {
 background-color: white;
 padding: 20px;
 margin-top: 20px;
}
/* Clear floats after the columns */
.row:after {
 content: "";
 display: table;
 clear: both;
}
/* Footer */
.footer {
 padding: 20px;
 text-align: center;
 background: #ddd;
 margin-top: 20px;
}
@media screen and (max-width: 800px) {
 .leftcolumn, .rightcolumn {
  width: 100%;
  padding: 0;
 }
}
@media screen and (max-width: 400px) {
 .topnav a {
  float: none;
  width: 100%;
 }
}
</style>
</head>
<body>
<div class="header">
 <h1>My Website</h1>
 <p>Resize the browser window to see the effect. </p>
</div>
<div class="topnav">
 <a href="#">Link</a>
 <a href="#">Link</a>
 <a href="#" style="float:right">Link</a>
</div>
<div class="row">
 <div class="leftcolumn">
  <div class="card">
```

```
  <h2>TITLE HEADING</h2>
  <h5>Title description, Dec 7, 2022</h5>
  <div class="fakeimg" style="height: 200px ;"> Image</div>
  <p>Some text..</p>
 </div>
 <div class="card">
   <h2>TITLE HEADING</h2>
   <h5>Title description, Sep 2, 2022</h5>
   <div class="fakeimg" style="height: 200px ;"> Image</div>
   <p>Some text..</p>
   </div>
 </div>
 <div class="rightcolumn">
  <div class="card">
   <h2>About Me</h2>
   <div class="fakeimg" style="height: 100px ;"> Image</div>
    </div>
  <div class="card">
    <h3>Popular Post</h3>
    <div class="fakeimg"><p>Image</p></div>
    <div class="fakeimg"><p>Image</p></div>
    <div class="fakeimg"><p>Image</p></div>
   </div>
   <div class="card">
    <h3>Follow Me</h3>
    <p>Some text..</p>
   </div>
  </div>
 </div>
 <div class="footer">
  <h2>Footer</h2>
 </div>
 </body>
 </html>
```

10. Write a server-site script for login process assume that user name and password have already exist on database TU under the user table (id, user, password) **[10]**



Ans:
```
<? php
 // Initialize the session
 session_start();
 if(isset($_SESSION["loggedin"]) && $_SESSION["loggedin"] === true){
   header("location: welcome.php");
```

```
    exit;
}
 // include config file
require_once "config.php";
 // define variables and initialize with empty values
$username = $password = "";
$username_err = $password_err = $login_err = "";
 // processing form data when form is submitted
if ($_SERVER["REQUEST_METHOD"] == "POST"){
    // Check if username is empty
   if (empty(trim($_POST["username"]))){
      $username_err = "Please enter username.";
   } else {
      $username = trim ($_POST ["username"]);
   }
   // Check if password is empty
   if (empty(trim($_POST["password"]))){
      $password_err = "Please enter your password.";
   } else {
      $password = trim ($_POST ["password"]);
   }
      // validate credentials
   if (empty($username_err) && empty($password_err)){
      // prepare a select statement
 $sql = "SELECT id, username, password FROM users WHERE username
=?";
         if ($stmt = mysqli_prepare($link, $sql)){
         // Bind variables to the prepared statement as parameters
         mysqli_stmt_bind_param($stmt, "s", $param_username);
         // Set parameters
         $param_username = $username;
         // Attempt to execute the prepared statement
         if (mysqli_stmt_execute($stmt)){
            // Store result
            mysqli_stmt_store_result($stmt);
            // Check if username exists, if yes then verify password
            if (mysqli_stmt_num_rows($stmt) == 1){
               // Bind result variables
      mysqli_stmt_bind_result($stmt, $id, $username,
$hashed_password);
               if (mysqli_stmt_fetch($stmt)){
                  if (password_verify($password, $hashed_password)){
            // Password is correct, so start a new session
                  session_start();
            // Store data in session variables
                  $_SESSION ["loggedin"] = true;
                  $_SESSION ["id"] = $id;
                  $_SESSION ["username"] = $username;
                 // Redirect user to welcome page
```

```
                header ("location: welcome.php");
            } else {
                // Password is not valid, display a generic error message
                $login_err = "Invalid username or password.";
            }
        }
    } else {
        // Username doesn't exist, display a generic error message
        $login_err = "Invalid username or password.";
    }
} else {
    echo "Oops! Something went wrong. Please try again later.";
}
// Close statement
mysqli_stmt_close($stmt);
}
}
// Close connection
mysqli_close($link);
}
?>
<! DOCTYPE html>
<html lang="en">
<head>
    <meta charset="UTF-8">
    <title>Login</title>
    <link rel="stylesheet"
href="https://stackpath.bootstrapcdn.com/bootstrap/4.5.2/css/bootstrap.
min.css">
    <style>
        body{ font: 14px sans-serif; }
        .wrapper{ width: 360px; padding: 20px; }
    </style>
</head>
<body>
    <div class="wrapper">
        <h2>Login</h2>
        <p>Please fill in your credentials to login. </p>
        <?php
        if(!empty($login_err)){
            echo '<div class="alert alert-danger">' . $login_err . '</div>';
        }
        ?>
<form action="<?php echo htmlspecialchars($_SERVER["PHP_SELF"]); ?>"
method="post">
            <div class="form-group">
                <label>Username</label>
```

```
            <input type="text" name="username" class="form-control <?php
echo (!empty($username_err)) ? 'is-invalid': '' ;?>" value="<?php echo
$username; ?>">
            <span class="invalid-feedback"><?php echo $username_err;
?></span>
        </div>
        <div class="form-group">
            <label>Password</label>
            <input type="password" name="password" class="form-control
<?php echo (!empty($password_err)) ? 'is-invalid': '' ;?>">
            <span class="invalid-feedback"><?php echo $password_err;
?></span>
        </div>
        <div class="form-group">
            <input type="submit" class="btn btn-primary" value="Login">
        </div>
        <p>don't have an account? <a href="register.php">Sign up
now</a>.</p>
    </form>
  </div>
</body>
</html>
```

11. What are the rules for Well-formed xml document? Create a sample well-formed xml and validate it with DTD Schema.

Ans: The XML Syntax rules for Well-formed XML include:

- All XML elements must have a closing tag.
- XML tags are case-sensitive.
- All XML elements must be properly nested.
- All XML documents must have a root element.
- Attribute values must always be quoted.
- With XML, whitespace is preserved

The Namespace-well-formed rules include:

- All element and attribute names contain either zero or one colon.
- No entity names, processing instruction targets, or notation names contain any colons

Building XML Document

In HTML, we have to use predefined tags like <html></html> or <body></body> for interpreting our data on the web. But, when using XML, user-defined tags can be created easily, and we use them to transport information between webpages.

```
<?xml version="1.0"?>
<customer>
 <firstname>Sohan</firstname>
 <lastname>Bhatt</lastname>
 <companyname>Section</companyname>
 <email>sohan@section.io</email>
 <message>Welcome message</message>
</customer>
```

Validating using DTD

There are two types of DTD validations: Internal validation and External validation.

For internal validations, we will write the whole DTD in the same file as the XML file, which can be used for validation.

Similarly, the external validation will validate the XML based on the DTD written in a separate file with the .dtd extension.

If it's an Internal DTD validation, it shows the whole XML code with its DTD validation below:

```
<?xml version="1.0" encoding="utf-8"?>
<!DOCTYPE customer [
<!ELEMENT customer (firstname, lastname, companyname, email, message)>
<!ELEMENT firstname (#PCDATA)>
<!ELEMENT lastname (#PCDATA)>
<!ELEMENT companyname (#PCDATA)>
<!ELEMENT email (#PCDATA)>
<!ELEMENT message (#PCDATA)>
]>
<customer>
  <firstname>Sohan</firstname>
  <lastname>Bhatt</lastname>
  <companyname>Section</companyname>
  <email>sohan@section.io</email>
  <message>Welcome message</message>
</customer>
```

If it's an External DTD validation, it can store the DTD code in a file called validation.dtd.

```
<!ELEMENT customer (firstname, lastname, companyname, email, message)>
<!ELEMENT firstname (#PCDATA)>
<!ELEMENT lastname (#PCDATA)>
<!ELEMENT companyname (#PCDATA)>
<!ELEMENT email (#PCDATA)>
<!ELEMENT message (#PCDATA)>
```

And now the DTD file can be referenced in XML as shown below:

```
<?xml version="1.0" encoding="utf-8"?>
<!DOCTYPE customer SYSTEM "validation.dtd">
<customer>
  <firstname>Sohan</firstname>
  <lastname>Bhatt</lastname>
  <companyname>Section</companyname>
  <email>sohan@section.io</email>
  <message>Welcome message</message>
</customer>
```

In both types of validations, DTD does the parsing based on the structure that defines the XML file.

MODEL QUESTIONS SETS FOR PRACTICE

MODEL SET 1

Bachelor in Computer Applications **Full Marks: 60**
Course Title: Web Technology **Pass Marks: 24**
Code No: CACS 205 **Time: 3 hours**
Semester: III

Candidates are required to answer the questions in their own words as far as possible.

Group A

Attempt all the questions. **[10x1 = 10]**

1. Circle (O) the correct answer.

i. HTML stands for?
   a) Hyper Text Markup Language b) High Text Markup Language
   c) Hyper Tabular Markup Language d) None of these

ii. attribute of <form> tag
   a) Method b) Action
   c) Both (a) & (b) d) None of these

iii. White spaces in XML includes
   a) Things like space characters, new lines and tabs
   b) Only spaces
   c) Space between two double quotes
   d) None of these

iv. XPATH used to.....
   a) Address your documents by specifying a location path
   b) Address the server
   c) Store the IP address of the server
   d) None of these

v. DTD's are.....
   a) Ways to create templates for out does type
   b) Document type declaration in XML
   c) Part of Name spaces
   d) None of these

vi. The words Document Node, Node list, Element Node, Named Node Map etc. are
   a) Interfaces b) Objects
   c) Attributes d) Elements

vii. Which of the following creates push button?
   a) CHECK BOX b) RADIO
   c) RESET d) INPUT

viii. Scheme is.....
   a) template written in XML and can be modified at runtime
   b) read only for all practical purposes
   c) a global name space
   d) None of these

ix. A much better approach to establish the base URL is to use.....

a) BASE element b) HEAD element
c) both (a) and (b) d) none of these

x. XSL is.....

a) an XML based language to create style sheets
b) a language which is not used in XML
c) extensible solution language
d) extended style sheet language

Group B

Attempt any SIX questions. **[6x5 = 30]**

2. *Create a DTD to display daily schedule of user.*
3. Write XML Schema for library information system.
4. Discuss the various terms related to Document Type Definition.
5. How the result set of MySQL is handled in PHP?
6. Describe different popup boxes supported by java script briefly. Write a sample program to show use these popup boxes.
7. Create
8. Define frame. Create a HTML page that displays multiple frames in a window.

Group C

Attempt any TWO questions. **[2x10 = 20]**

9. 'JavaScript is referred to as Object based programming language'. Justify with an example.
10. Which java script operator calculates the remainder by dividing two integers? Explain with example
11. What is client/server technology? Differentiate between web client and web server.

MODEL SET 2

Group A

Attempt all the questions. **[10x1 = 10]**

1. Circle (O) the correct answer.

i. How DOM differs from SAX?

a) DOM is not event driven and builds up the whole memory
b) SAX is event driven and requires less space
c) DOM and SAX are packages
d) None of these

ii. Namespace.....

a) distinguishes one XML vocabulary from another
b) provides the spaces in the names
c) is a querying language
d) none of these

iii. Document type declaration and document type definition are

a) different terms b) same
c) uncertain d) can't say

iv. Correct HTML tag for the largest heading is

a) <head> b) <h6>
c) <heading> d) <h1>

v. Markup tags tell the web browser
   a) How to organize the page
   b) How to display the page
   c) How to display message box on page
   d) None of these

vi. www is based on which model?
   a) Local-server b) Client-server
   c) 3-tier d) None of these

vii. What are Empty elements and is it valid?
   a) No, there is no such term as Empty Element
   b) Empty elements are element with no data
   c) No, it is not valid to use Empty Element
   d) None of these

viii. Which of the following is a container?
   a) <SELECT> b) <BODY>
   c) <INPUT> d) Both (a) and (b)

ix. The attribute, which define the relationship between current document and HREF'ed URL is.....
   a) REL b) URL
   c) REV d) all of these

x. Character encoding is.....
   a) method used to represent numbers in a character
   b) method used to represent character in a number
   c) a system that consists of a code which pairs each character with a pattern, sequence of natural numbers or electrical pulse in order to transmit the data
   d) none of these

Group B

Attempt any SIX questions. **[6x5 = 30]**

2. Describe the scoping rules for the Java script.
3. Create a HTML which uses CSS that gives all H1 and H2 elements a padding of 0.5 ems; a grooved border style and a margin of 0.5 ems.
4. Write a short note on creating tables in HTML.
5. Write a short note on JavaScript DOM.
6. Differentiate between SMTP and POP.
7. Why CSS are important in web designing? Describe the use of id and class selectors with suitable example.
8. Write the JAVA script to print "Good-Day" using IF-ELSE condition.

Group C

Attempt any TWO questions. **[2x10 = 20]**

9. Why XSD is used? How it is different from DTD? Write XSD and DTD for Book, where book contains author, publication, Title, price and pages. Further Author contains First Name, Last Name, and Education in order and can occur 4 times maximum and 1 times minimum. Define root element of your own interest
10. What are two methods of validating the forms? Highlight their good and bad points. Prepare a form containing the controls Name, Phone, and Email. Validate the form such that Name field contains only text, Phone field contains only digits, and Email field contains valid email id.
11. Explain 2-tier, 3-tier and n-tier client server architecture.

MODEL SET 3

Group A

Attempt all the questions. **[10x1 = 10]**

1. Circle (O) the correct answer.

i. From which tag the descriptive list starts?
a) <LL> b) <DD>
c) <DL> d) <DS>

ii. Correct HTML to left align the content inside a table cell is
a) <tdleft> b) <td raligh = "left" >
c) <td align = "left"> d) <td leftalign>

iii. How can you open a link in a new browser window?
a) < a href = "url" target = "new"> b) <a href = "url" target= "_blank">
c) <a href = "url".new> d) <a href = "url" target ="open">

iv. Who is making the Web standards?
a) Mozilla b) Microsoft
c) The World Wide Web consortium d) Nvdia

v. Can the element <First> be replaced with <first>
a) No, they represent different elements altogether
b) Both are same
c) First is correct only
d) First is only correct

vi. Which of the tag is used to create a number list?
a) <LI> b. <OL>
c) <LI> and <OL> d. None of these

vii. Document type declaration and document type definition are
a) different terms b) same
c) uncertain d) can't say

viii. XSLT is.....
a) an extended style sheet language is used for formatting
b) an extensible style sheet language and is used for formatting
c) used for session tracking in XML
d) none of these

ix. What is XML?
a) Subset of SGML, Extensible Markup Language
b) Superset of SGML, Extendable Markup Language
c) Like SGML, Extended Markup Language
d) None of these

x. A document has how many DTD's?
a) Two b) None
c) Three d) All of these

Group B

Attempt any SIX questions. **[6x5 = 30]**

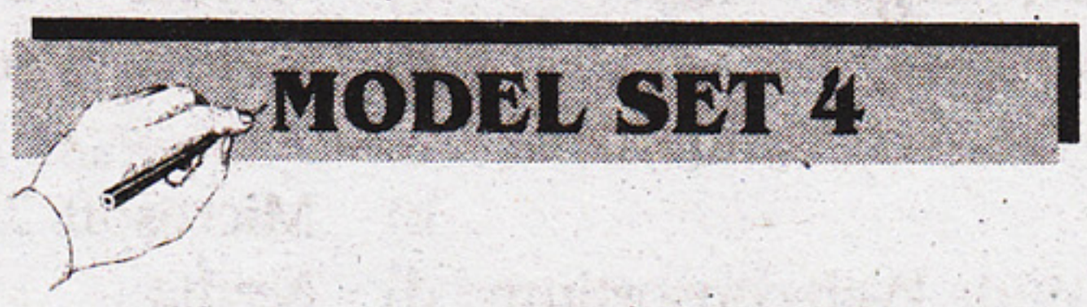
2. When the namespace is called in XML? Why?
3. Differentiate between 'Get' and 'Post' methods in PHP.
4. What is JavaScript? How it is different from server side scripting languages? Discuss uses of JavaScript briefly.

5. What are the drawbacks of HTML? How are they addressed in XML?
6. Elaborate Internet addressing and types of Internet connections.
7. Explain the concept of Exception Handing. How will you create your own exception?
8. What is the use of XML namespaces? Explain with suitable example.

Group C

Attempt any TWO questions. **[2x10 = 20]**

9. What is cookie? Explain the methods of setting and reading cookies using java script.
10. Explain 2-tier, 3-tier and n-tier client server architecture.
11. Write a XML document for storing records of 5 employees with ID, Name, Salary and Age. Create a XSLT file to display the record of employees having salary more than 20000.



Group A

Attempt all the questions. **[10x1 = 10]**

1. Circle (O) the correct answer.

i. Which of these is a client server application?
   a) Web browsing b) E-mail
   c) Internet chat d) All of the above

ii. <INPUT> is.....
   a) format tag b) empty tag
   c) both (a) and (b) d) none of these

iii. What is the correct HTML for adding a background color?
   a) <background>yellow<Background>
   b) <body color = "yellow">
   c) <body bg color = "yellow">
   d) <body bg ="yellow">

iv. Main container for <TR>, <TD> and <TH> is
   a) <TABLE> b) <GROUP>
   c) <DATA> d) All of these

v. Which of the following selector selects the elements that are checked?
   a) E ~ F b) ::after
   c) :checked d) none of the mentioned

vi. Document Object Model (DOM) is a
   a) a parser b) specification
   c) coding style d) none of these

vii. Node in XML is.....
   a) any part of the document whether it is elements, attribute or otherwise
   b) referred only to the attributes
   c) referred to the top element in the document
   d) none of these

viii. Well formed XML
   a) meets certain grammatical rules outlined in the XML 1.0 specification
   b) doesn't contain DTD's
   c) is full of formula's
   d) none of these

ix. XPATH used to
   a) Address your documents by specifying a location path
   b) Address the server
   c) Store the IP address of the server
   d) None of these

x. Which of the following statements are true?
   a) Http runs over TCP
   b) Http allows information to be stored in a URL
   c) Http can be used to test the validity of a hypertext link
   d) All of the above

Group B

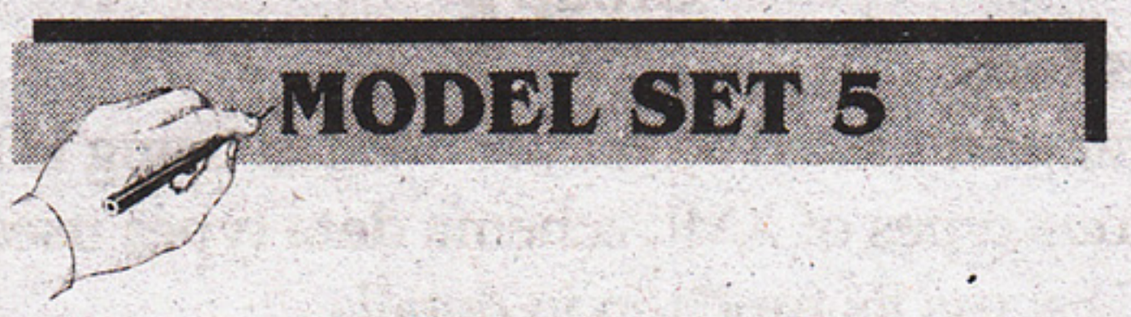
Attempt any SIX questions. **[6x5 = 30]**

2. Write XML Schema for library information system.
3. Discuss the various terms related to Document Type Definition.
4. How the result set of MySQL is handled in PHP?
5. Describe different popup boxes supported by java script briefly. Write a sample program to show use these popup boxes.
6. Create a HTML form with five basic features.
7. Write about the various Objects used in Java script.
8. Define frame. Create a HTML page that displays multiple frames in a window.

Group C

Attempt any TWO questions. **[2x10 = 20]**

9. What is Document object model? Discuss the various DOM methods used with java script.
10. What are the benefits of using styles compared with placing formatting directly into the text of the Web page?
11. Write a script that reads an integer and determines whether it is PRIME Number or Not.



Group A

Attempt all the questions. **[10x1 = 10]**

1. Circle (O) the correct answer.

i. HTML is what type of language?
   a) Scripting Language b) Markup Language
   c) Programming Language d) Network Protocol

ii. Fundamental HTML Block is known as _____.
   a) HTML Body b) HTML Tag
   c) HTML Attribute d) HTML Element

iii. What should be the first tag in any HTML document?
   a) <head> b) <title>
   c) <html> d) <document>

iv. What tag is used to display a picture in a HTML page?
   a) picture b) image
   c) img d) src

v. Which of the following is true about Web services?
   a) Web services are open standard (xml, soap, http etc.) based web applications.
   b) Web services interact with other web applications for the purpose of exchanging data.
   c) Web services can convert your existing applications into web-applications.
   d) All of the above.

vi. How request is sent in XML-RPC?
   a) Requests are encoded in xml and sent via http post.
   b) Requests are encoded in xml and sent via http get.
   c) Both of the above.
   d) None of the above.

vii. Which of the following is correct about SOAP?
   a) Soap is an xml-based protocol for exchanging information between computers.
   b) Soap is a communication protocol.
   c) Soap is for communication between applications.
   d) All of the above.

viii. The attribute, which define the relationship between current document and HREF'ed URL is.....
   a) Rel b) Url
   c) Rev d) None of the above

ix. HTML web pages can be read and rendered by _____.
   a) Compiler b) Server
   c) Web Browser d) Interpreter

x. XPATH used to.....
   a) Address your documents by specifying a location path
   b) Address the server
   c) Store the IP address of the server
   d) None of these

Group B

Attempt any SIX questions. **[6x5 = 30]**

2. Explain how basic and nested tables are created using HTML
3. Explain the various types of XML schema data types used.
4. What is HTTP? Discuss its function in detail.
5. Explain the four possible keywords in a DTD declaration with suitable examples.
6. Describe the use of id and class selectors with suitable example.
7. What is FTP? Explain their working mechanism.
8. What are the benefits of using styles compared with placing formatting directly into the text of the Web page?

Group C

Attempt any TWO questions. **[2x10 = 20]**

9. Compare XML schema with DTD. Why do we need XSLT? Explain XSL element.
10. Discuss SMTP. What is HTTP? Discuss its function in detail.
11. Develop a simple website that asks the users to register using user name, password and email address. Store these information's in a database. Use client side script to validate the user input during registrations.

MODEL SET 6

Group A

Attempt all the questions. **[10x1 = 10]**

1. Circle (O) the correct answer.

i. How can you make a numbered list?
   a) <dl> b) <ol>
   c) <list> d) <ul>

ii. A script is a.....
   a) Program or sequence of instructions that is interpreted or carried out by processor directly
   b) Program or sequence of instruction that is interpreted or carried out by another program
   c) Program or sequence of instruction that is interpreted or carried out by web server only
   d) None of above

iii. When compared to the compiled program, scripts run
   a) Faster b) Slower
   c) The execution speed is similar d) Depend on the script

iv. Which component of JDOM Parser represents DOM tree?
   a) Document b) Element
   c) Attribute d) Text

v. Which of the following is the correct syntax to print a page using JavaScript?
   a) Window.print(); b) Browser.print();
   c) Navigator.print(); d) Document.print();

vi. Which of the following type of variable is visible only within a function where it is defined?
   a) Global variable b) Local variable
   c) Both of the above. d) None of the above.

vii. A piece of icon or image on a web page associated with another webpage is called
   a) Url b) Hyperlink
   c) Plugin d) None of the mentioned

viii. What is a web browser?
   a) A program that can display a web page
   b) A program used to view html documents
   c) It enables user to access the resources of internet
   d) All of the mentioned

ix. Common gateway interface is used to
   a) Generate executable files from web content by web server
   b) Generate web pages
   c) Stream videos
   d) None of the mentioned

x. URL stands for.....
   a) Unique reference label b. Uniform reference label
   c) Uniform resource locator d. Unique resource locator

Group B

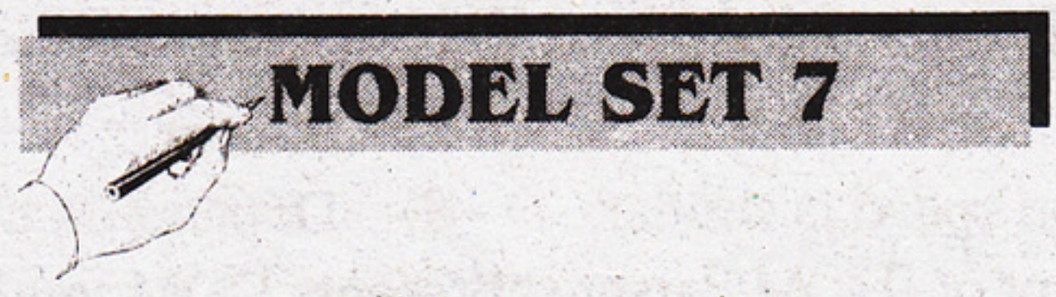
Attempt any SIX questions. **[6x5 = 30]**

2. What is the structure of HTML file? Explain with example.
3. Define CSS? How can you use an external CSS? Explain.
4. Discuss the use of Cookies with suitable example.
5. What is web server software? Discuss its role on the internet.
6. Write server-side code to select data stored in the database.
7. Discuss integrated window authentication.
8. How can you define event handler? Write a java script to demonstrate event handling.

Group C

Attempt any TWO questions. **[2x10 = 20]**

9. Explain the use of XML in web development. Write internal and external DTD to describe "mail" as a root element and "to", "From", and "Subject" and "Message" as child elements.
10. Explain the architectural issues of web layer with example.
11. Develop a simple web site that takes first name, last name, and address from the user and store this information in the database. Use java script to validate form data.



Group A

Attempt all the questions. **[10x1 = 10]**

1. Circle (O) the correct answer.

i. Which of the following options is correct with regard to HTML?
   a) It is a modeling language
   b) It is a dtp language
   c) It is a partial programming language
   d) It is used to structure documents

ii. HTML is considered as _____ language.
   a) Higher level language b) Markup language
   c) OOP language d) Programming language

iii. HTML markup language is a set of Markup _____.
   a) Tags b) Attributes
   c) Groups d) Sets

iv. Which attribute is used to name an element uniquely?
   a) Class b) Id
   c) Dot d) All of above

v. What DOM stands for?
   a) Direct object model b) Document object modeling
   c) Document object model d) Document output model

vi. Which of the following is true about XPath?
   a) Xpath is an official recommendation of the World Wide Web consortium (w3c).
   b) It defines a language to find information in an xml file.
   c) Both of the above.
   d) None of the above.

vii. Which of the following statements is not true about XML Schemas:
a) They are used to define the content and structure of data.
b) They define a set of symbols and the relationships of those symbols.
c) They are themselves xml documents.
d) They have their own syntax.

viii. In HTTP, a _____ server is a computer that keeps copies of responses to recent requests.
a) Regular
b) Proxy
c) Both a and b
d) None of the above

ix. Which of the following is the correct syntax to redirect a url using JavaScript?
a) document.location='http://www.newlocation.com';
b) browser.location='http://www.newlocation.com';
c) navigator.location='http://www.newlocation.com';
d) window.location='http://www.newlocation.com';

x. Web-applications were developed in order to interact _____ .
a) Different platforms
b) Server
c) Browsers
d) None of these

Group B

Attempt any SIX questions. **[6x5 = 30]**

2. Create a DTD to display daily schedule of user.
3. Write XML Schema for library information system.
4. Discuss the various terms related to Document Type Definition.
5. How the result set of MySQL is handled in PHP?
6. Describe different popup boxes supported by java script briefly. Write a sample program to show use these popup boxes.
7. What types of primary data structures are supported in Perl? Discuss
8. Define frame. Create a HTML page that displays multiple frames in a window.

Group C

Attempt any TWO questions. **[2x10 = 20]**

9. What is Document object model? Discuss the various DOM methods used with java script.
10. What are the benefits of using styles compared with placing formatting directly into the text of the Web page?
11. Write a script that reads an integer and determines whether it is PRIME Number or Not.

MODEL SET 8

Group A

Attempt all the questions. **[10x1 = 10]**

1. Circle (O) the correct answer.

i. Which of the following layer in Web Service Protocol Stack is responsible for describing the public interface to a specific web service?
a) Service transport
b) Xml messaging
c) Service description
d) Service discovery

ii. HTTP uses the services of _____ on well-known port 80.
a) UDP b) IP
c) TCP d) none of the above

iii. Which of the following is true about variable naming conventions in JavaScript?
a) You should not use any of the JavaScript reserved keyword as variable name.
b) JavaScript variable names should not start with a numeral (0-9).
c) Both of the above.
d) None of the above.

iv. A web cookie is a small piece of data
a) sent from a website and stored in user's web browser while a user is browsing a website
b) sent from user and stored in the server while a user is browsing a website
c) sent from root server to all servers
d) none of the mentioned

v. An alternative of JavaScript on windows platform is.....
a) Vbscript b) Asp.net
c) Jsp d) None of the mentioned

vi. Which element contains the Head and Body elements inside it?
a) <!Doctype> b) <html>
c) <living being> d) None of above

vii. Which of the following is not an element in HTML document?
a) <!Doctype> b) <html>
c) <head> d) <body>

viii. Head and Body elements are nested inside which element?
a) DOCTYPE b) HTML
c) HEAD d) ALL OF ABOVE

ix. Which of the following creates push button?
a) CHECK BOX b) RADIO
c) RESET d) INPUT

Group B

Attempt any SIX questions. **[6x5 = 30]**

2. Explain how basic and nested tables are created using HTML
3. Explain the various types of XML schema data types used.
4. Show how SAX is an alternative method for parsing XML documents. Write its advantages.
5. Explain the four possible keywords in a DTD declaration with suitable examples.
6. Discuss how the XMLHttpRequest can be cancelled in AJAX.
7. Explain with an example program how to connect to a SQL Server database from a PHP script.
8. Describe the use of id and class selectors with suitable example.

Group C

Attempt any TWO questions. **[2x10 = 20]**

9. Develop a simple website that asks the users to register using username, password, and email address. Store these information's in a database. Use client side script to validate the user input during registration.
10. What is XML? Discuss the structure of XML file with example. Write an XML schema to describe "address" as an element and "city, state, street and house-no" as its attributes.
11. What is HTTP? Discuss its function in detail.

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