Chapter 4
Web Technology

How is a website accessed?

The URL (Uniform Resource Locator) is sent to a Domain Name System (DNS) server to obtain its IP (Internet Protocol) address and then the browser connects to this server using the IP address. The web server processes this request and the web page to be displayed is then sent to the client.

How is data sent from a client to a server?

The data to be sent is broken down into small data packets along with the address of the recipient computer by the TCP protocol. The routers route and transport these data packets to their destination computers using Internet Protocol.

How is security ensured in client to server communication?

Instead of sending plain text, HTTPS (Hyper Text Transfer Protocol Secure) technology is used to encrypt the username and password to send to the server. Banking transactions also use HTTPS.

Example for web server to web server communication

Web server of an online shopping website needs to send confidential information to a bank web server and vice versa. In such cases the web servers of the merchant and the bank are to be authenticated using digital certificates. Once the servers are authenticated, the servers communicate using encrypted data. Payment gateway is a server that acts as a bridge between merchant server and bank server and transfers money in an encrypted format whenever an online payment/money transfer is made.

What is web server?

Web server is a powerful computer that hosts websites. It consists of a server computer that runs a server operating system and web server software. It is always switched on and connected to a high bandwidth Internet connection. Example for server operating systems – Linux (Redhat, Ubuntu), Microsoft Windows Server. Example for web server package – Apache Server.

How does DNS obtain the IP address of a website?

1. The browser first searches its local memory to see whether it has the IP address of the given domain. If found, the browser uses it.
2. If it is not found in the browser cache, it checks the operating system's local cache for the IP address.
3. If it is not found there, it searches the DNS server of the local ISP.
4. In the absence of the domain name in the ISP's DNS server, the ISP's DNS server initiates a recursive search starting from the root server till it receives the IP address.
5. The ISP's DNS server returns this IP address to the browser.

What is Software Port Number?

Port number is a 16-bit number, used for communicating with a particular service available on the server. Eg: Port Number of HTTP – 80, HTTPS – 443, DNS – 53.

Static web page V/s Dynamic web page

Static web page	Dynamic web page
The content and layout of a web page is fixed.	The content and layout may change during run time.
Static web pages never use databases.	Database is used to generate dynamic content through queries.
Static web pages directly run on the browser and do not require any server side application program.	Dynamic web page runs on the server side application program and displays the results.
Static web pages are easy to develop.	Dynamic web page development requires programming skills.

What is meant by scripts in web designing?

Scripts are program codes written inside HTML pages. Examples for scripting languages: JavaScript, VB script, PHP, Perl, etc.

Client side scripting V/s Server side scripting

Client side scripting	Server side scripting
Script is copied to the client browser	Script remains in the web server
Script is executed in the client browser	Script is executed in the web server and the web page produced is returned to the client browser
Client side scripts are mainly used for validation of data at the client.	Server side scripts are usually used to connect to databases and return data from the web server
Users can block client side scripting	Server side scripting cannot be blocked by a user
The type and version of the web browser affects the working of a client side script	The features of the web browser does not affect the working of server side script

Client side scripting languages: JavaScript, VB Script

Server side scripting languages: PHP, JSP, ASP, Pearl

What is Cascading Style Sheet?

Cascading Style Sheets (CSS) is a style sheet language used for describing the formatting of a document written in HTML. Using CSS, we can control the colour of the text, the style of fonts, the spacing between paragraphs, how columns are sized and laid out, borders and its colours, what background images or colours are used, as well as a variety of other effects in a web page.

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HTML document and Web page

HTML document is a text file, made up of tags and attributes which work together to decide how the contents of the web page should be displayed on the browser. When an HTML document is opened by a browser, what we get is a web page.

HTML tags

Tags are the commands used in the HTML document that tell web browsers how to format and organise web pages to show the contents. Most tags are used in pairs - an opening tag and a closing tag. Eg: <HTML> and </HTML>. Tags that require opening and closing tags are known as container tags. Tags that do not require closing tag are known as empty tags. Eg: <BR>, <IMG>

Attributes

Attributes are certain parameters frequently included within the opening tag to provide additional information. For example, BGCOLOR is an attribute of <BODY> tag which provides a specified colour to the background of the web page.

List of Structure Tags and their Attributes
The following are the structure tags that are essential in an html document. All of them are container tags.

Tags	Use	Attributes	Values and Purpose
<HTML>	To start an HTML document	Dir	To specify the direction of the text. The value "ltr" for left-to-right and "rtl" for right to left
		Lang	To specify the language. "en" for English, "hi" for Hindi
<HEAD>	To specify the head section of an HTML document. Usually it contains <TITLE> tag and <SCRIPT> tag		
<TITLE>	This tag pair contains the text to be displayed in the title bar of browser.		
<BODY>	Defines the body section of the web page. It contains everything to be displayed in the browser window.	Bgcolor	To specify a colour for the background of a web page. Colour name or code is given.
		Background	To show an image as the background of a web page. The filename of the image is given as the value.
		Text	To specify the colour for the text matter in the web page.
		Link Alink Vlink	To specify the colour for the link unvisited. To specify the colour for the link on click. To specify the colour for the link visited.
		Leftmargin	To specify the blank area left from the left edge of the browser window.
		Topmargin	To specify the blank area left from the top edge of the browser window.

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Some common tags and their attributes

Tags	Use	Attributes	Values and Purpose
<H1> ….. ….. <H6>	To provide different levels of headings.	**Align**	To align the heading left, right or center of the browser window. **"left"**, **"right"** and **"center"** are the values.
** **	To break the current line of text and continues in the next line. No attributes.		
<P>	To create a paragraph leaving a blank line. There is a blank line between the preceding and succeeding text of the <P> tag. **Align** attribute can be used for **left**, **right**, **center** or **justify** alignment.		
<HR>	To draw a horizontal line across the width of the browser window	**Size**	To specify the thickness
		Width	To reduce the width of the line
		Color	To specify the colour for the line
		Noshade	To avoid shading to the line
<CENTER>	To bring the content to the centre of the browser window. No attribute.		

Text formatting tags

These tags are used to format text matter. They do not have any attribute. These are container tags.

Tags	Use
<B> and **<STRONG>**	To make the text **bold** face.
<I> and **<EM>**	To make the text *italics* or *emphasis*.
<U>	To <u>underline</u> the text
<S> and **<STRIKE>**	To ~~strike through~~ the text
<BIG>	To make the text big sized
<SMALL>	To make the text small sized
<SUB>	To make the text $_{subscripted}$
<SUP>	To make the text ^{superscripted}
<Q>	To enclose the text in "double quotes"
<BLOCKQUOTE>	To indent the text

<PRE> tag

It is used to turn off the automatic formatting of the text applied by the browser. It tells the browser that the enclosed text is preformatted and should be displayed in its original form.

<ADDRESS> tag

The content of this tag can include name, phone numbers, PIN numbers, e-mail addresses, etc. Most of the browsers display the texts in italics.

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Some other tags

Tags	Use	Attributes	Values and Purpose
<MARQUEE>	To scroll a text or image in the browser	**Height**	To set the height of the scroll area. Values are given in pixels or % of browser height
		Width	To set the width of the scroll area. Values are given in pixels or % of browser width
		Direction	To specify the direction of scrolling. **"left"**, **"right"**, **"up"**, **"down"** are the values. Default value is **"left"**
		Behavior	To specify the style of scrolling. **"scroll"** for normal scrolling **"slide"** for a scroll and stay **"alternate"** for bidirectional scrolling
		Scrolldelay	To slow down (delay) the scroll
		Scrollamount	To speed up the text scrolling
		Bgcolor	To specify a colour for the background of the scroll area.
<DIV>	To define a section in the document with separate alignment and style	**Align**	To align the text in the section. **"Left"**, **"Right"**, **"Center"** and **"Justify"** are the values
		Style	To indicate how to render the content in the section in terms of colour, font, etc.
<FONT>	To change the size, style and colour of the text enclosed	**Color**	To set the text colour using a ColorName or a colour code
		Face	It specifies the font face like Arial, Calibri, etc.
		Size	It specifies the font size
<IMG>	To insert image in a web page	**Src**	To specify the file name of the image
		Height Width	To specify the height and width to display the image. Value may be in pixels or % of height and width of the browser window
		Border	To put a border for the image. A numerical value specifies the thickness.
		Align	It specifies the alignment of the image with respect to the preceding text. **"Bottom"**, **"Middle"** and **"Top"** are the values.
		Alt	To specify the text to be displayed in the absence of the image.

Comments in HTML document

Any content placed within the tag <!--   --> will be treated as a comment and will be completely ignored by the browser.

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HTML entities for reserved characters

In HTML, the symbols like **<**, **>**, **&**, etc. have special meaning and cannot be used in the HTML documents as part of the text content. So, when we want to display these symbols as part of the text in the web page, we must use HTML entities. Table shows a list of a few special characters and their equivalent entities.

Character	Entity	Description
		Non Breaking Space
"	"	Double quotation mark
'	'	Single quotation mark
&	&	Ampersand
<	<	Less than
>	>	Greater than
©	©	Copyright Symbol
™	™	Trademark Symbol
®	®	Registered Symbol

Questions from Previous Years' Question Papers (Computer Applications)

1. The default port number of http is
   (a) 20   (b) 80   (c) 110   (d) 53   (1) (March 2016)
2. Write HTML tag to set the colour of hyperlink to red.
   (a) <A colour = "red">   (b) <A colour = "#FF0000">
   (c) <BODY LINK = "Red">   (d) <BODY ALINK = "Red">   (1) (March 2016)
3. A web page is created to display the result of engineering entrance examination.
   (a) What type of web page it is?
   (b) Mention any two features of it.   (2) (March 2016)
4. _____ tag is used to make the size of the text smaller than current text in HTML.
   (a) <b>   (b) <small>   (c) <sub>   (d) <sup>   (1) (SAY 2016)
5. Compare client side scripting and server side scripting.   (2) (SAY 2016)
6. Nila wanted to set the picture "sky.jpg" as the background of his web page. Choose the correct tag for doing this.
   (a) <IMG SRC = "sky.jpg">
   (b) <BODY SRC = "sky.jpg">
   (c) <IMG BACKGROUND = "sky.jpg">
   (d) <BODY BACKGROUND = "sky.jpg">   (1) (SAY 2016)
7. Compare static and dynamic web pages.   (3) (March 2017)
8. Compare client side scripting and server side scripting.   (3) (March 2017)
9. _____ is server that act as a bridge between merchant server and bank server.
                                                                 (1) (March 2017)
10. Every web server has default colours to display text and hyperlink. How can we change these default colour?   (2) (March 2017)
11. The port number for HTTP is _____.
    (a) 20   (b) 80   (c) 110   (d) 53   (1) (SAY 2017)
12. Differentiate static and dynamic web pages.   (2) (SAY 2017)
13. Pick the odd one out:
    (a) BODY   (b) HTML   (c) HEAD   (d) ALIGN   (1) (SAY 2017)

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Questions from Previous Years' Question Papers (Computer Science)

1. HTTPS stands for _____.   (1) (March 2016)

2. How will you distinguish a static web page from a dynamic web page?   (2) (March 2016)

3. Write HTML code for a web page of an institution with the following features. It should have a marquee welcoming users, a heading in different fonts and a picture and address of the institution.   (3) (March 2016)

4. (a) Classify the following scripting languages into client side and server side:
   ASP, PHP, JavaScript, VBScript   (2)

   (b) Write any one use of client side scripting.   (1) (SAY 2016)

5. Fill the following table with appropriate points to distinguish <P> tag and <BR> tag:

<P> tag	 tag
1.	1. Breaks the current line and continues to the next line.
2. Container tag	2.
3. Align attribute sets the alignment of the text in the paragraph	3.

                                                            (3) (SAY 2016)

6. Default port number for HTTPS is _____.   (1) (March 2017)

7. What are the various types of client side scripting languages?   (2) (March 2017)

8. Develop a web page of an organization with the following features:
   (a) Has an image as background
   (b) Welcomes users with a marquee in attractive fonts.
   (c) Display address of the organization.   (3) (March 2017)

9. Expand the name of the language which is used to develop webpage.   (1) (SAY 2017)

10. Write an HTML code for web page for your supermarket "HELPLINE SUPERMARKET" with the following details and features:
    (1) A heading followed by a paragraph of 2 sentences about the district using text formatting tags and attributes.
    (2) Give postal address of the supermarket with phone number and e-mail id.
    (3) Include a marquee that "Hurry up, 50% off for all purchase".   (5) (SAY 2017)

11. Explain and compare the features of any four scripting languages.   (5) (SAY 2017)

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Chapter 5
Web Designing using HTML

Different types of Lists in HTML

There are three kinds of lists in HTML - unordered lists, ordered lists and definition lists.

Unordered list displays a bullet in front of each item in the list. Ordered list presents the items in some numerical or alphabetical order. A definition list is a list of terms and the corresponding definitions.

Tags	Use	Attributes	Values and Purpose
<UL>	To create bulleted list	**Type**	To specify the type of bullet. **"Disc"**, **"Circle"** and **"Square"** are the values for ●, ○ and ■
<OL>	To create numbered list	**Type**	To specify the type of numeral. The values are **"1"**, **"I"**, **"i"**, **"a"** and **"A"**.
		Start	To specify the starting number. The value should be an integer.
<LI>	To specify an item in the unordered or ordered list. Used inside the pairs **<UL>**…**</UL>** and **<OL>** … **</OL>**		
<DL>	To create a definition list		
<DT>	Used inside **<DL>**… **</DL>** to specify each data item (or term) in the list		
<DD>	Used after each **<DT>** to describe the term		

Nested List: A list inside another list is called nested list. Usually unordered and ordered lists are nested.

Links in HTML

A hyperlink (or simply link) is a text or an image in a web page that we can click on, and move to another document or another section of the same document. The **<A>** tag, called anchor tag is used to give hyperlinks. Anything given between the tag pair **<A>** and **</A>** will be a link. **Href** is the main attribute of **<A>** tag. The URL (address of the web page/site) is given as its value.

There are two types of linking – internal linking and external linking.

A link to a particular section of the same document is known as internal linking. The attribute **Name** of **<A>** tag is used to specify the *name* of a section of the web page. This *name* should be prefixed with **#** symbol to create the link using **Href** attribute.

The link from one web page to another web page is known as external linking. The URL (address of the web page/site) is given as the value for **Href** attribute.

The following is an example for e-mail linking:

<A Href= mailto: "scertkerala@gmail.com"> SCERT</A>

Inserting Music and Video in Web pages

To add music or video to the web page, **<EMBED>** tag is used. There is another tag **<NOEMBED>** which can be used to display a text if the **<EMBED>** tag is not supported by the browser. The main attribute of the **<EMBED>** tag is **Src**, which specifies the URL of the music or video files to be included. The other attributes are **Height**, **Width**, **Align**, etc.

There is another tag **<BGSOUND>** with which music can be played in the background while the page is viewed.

Creating Table in Web page

Tags	Use	Attributes	Values and Purpose
<TABLE>	To create table	**Border**	To specify the thickness of the border line around the table.
		Bordercolor	To set the colour to the border
		Align	To specify the position of the table inside the browser window.
		Bgcolor	To set the background colour of the table.
		Background	To set an image as the background of the table.
		Cellspacing	To specify the space to be left between cells.
		Cellpadding	To specify the space in between the cell border and cell content.
<TR>	To specify a row in a table	**Align**	To specify the horizontal alignment of the text in a cell in that particular row.
		Valign	To specify the vertical alignment of the content in a cell of a row. **Top**, **Middle**, **Bottom** or **Baseline** are the values.
		Bgcolor	To give background colour to a particular row.
<TH>	To specify the heading cell. Data will be bold and central aligned.	**Align** **Valign** **Bgcolor**	Same as in the case of <TR>, but applicable only in a particular cell.
		Colspan	To span a cell over 2 or more columns in a row. It is a kind of merging 2 or more columns in a row.
<TD>	To specify the data in a cell within a row.	**Rowspan**	To span a cell over 2 or more rows in a column. It is a kind of merging 2 or more rows in a column.
<CAPTION>	To add descriptive text to a table as its caption.		

Dividing the Browser window

The browser window can be divided into two or more panes to accommodate different pages simultaneously. HTML provides a tag **<FRAMESET>** to partition the browser window into different sections. Each individual section is called a frame. Such a frame can contain a web page.

Tags	Use	Attributes	Values and Purpose
<FRAMESET>	To partition the browser window into different frame sections.	**Cols**	To specify the number of vertical frames in the frameset.
		Rows	To specify the number of horizontal frames.
		Border	To specify the thickness of border for the frames
<FRAME>	To define the frame for including the web page	**Src**	To specify the html file to be loaded in the frame.
		Name	To give a name to target the frame
<NOFRAME>	Used to display some text content in the window if the browser is unable to support frames.		

Nesting of Frameset

When we want to divide a horizontal frame into 2 or more vertical frame or vice versa nesting of frameset is used.

Forms in Web pages

HTML Forms are used to collect data from the webpage viewer for processing. A Form consists of two elements: a **<FORM>** container tag and Form controls like text boxes, textarea fields, drop-down menus, radio buttons, checkboxes, etc.

Tags	Use	Attributes	Values and Purpose
<FORM>	To provide a container for Form controls.	**Action**	To specify the URL of the Form handler to process the data collected.
		Method	To specify the method to upload the data. **Get** and **Post** are the values.
<INPUT>	To make different types of controls such as Text Box, Radio Button, Submit Button etc.	**Type**	To specify the control type. The values: **Text** creates textbox, **Password** creates textbox in which typed characters are displayed as asterisks (*), **Radio** creates radio buttons for selection, **Submit** creates submit button to upload data, **Reset** clears the entries in the Form.
		Name	To give a name to an input control.
		Value	To give an initial value to a control.
		Size	To specify the size of the text box and password box.
		Maxlength	To specify the maximum length of characters in text box and password box.

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		Name	To give a name to the control
\<TEXTAREA\>	To provide space to give text in more than one line.	**Rows**	To specify the number of rows in the area.
		Cols	To specify the number of characters in a row.
\<SELECT\>	To create drop down list box	**Name**	To identify the control
		Size	To specify whether it is a list box or combo box.
		Multiple	To allow selection of multiple items.
\<OPTION\>	To specify the items in the SELECT list	**Selected**	To indicate the item for default selection.
\<FIELDSET\>	To group related controls in the Form.		
\<LEGEND\>	To set a caption for FIELDSET group		

Overview of HTML 5

HTML5 was developed jointly by World Wide Web Consortium (W3C) and the Web Hypertext Application Technology Working Group (WHATWG). The new standard incorporates features like video playback, drag-and-drop etc. Mobile web browsers that are pre-installed in iPhones, iPads, Android phones, etc. support HTML5.

Questions from Previous Years' Question Papers (Computer Applications)

1. Consider the following list created using HTML.
   D. Laptop
   E. Desktop
   F. Printer

   What will be the value of START and TYPE attribute of <OL> tag?
   (a) START = "D" TYPE = "A"
   (b) START = "4" TYPE = "A"
   (c) START = "4" TYPE = "I"
   (d) START = "D" TYPE = "I"   (1) (March 2016)

2. Explain the HTML tag <table> and its attributes.   (3) (March 2016)

3. _____ attribute of <frame> tag is used to prevent users from resizing the border of a specific frame by dragging it.   (1) (SAY 2016)

4. Explain <OL> tag with suitable example.   (3) (SAY 2016)

5. Write the complete HTML tag that links the text "PSC" to the website www.keralapsc.org.   (1) (March 2017)

6. Explain nesting of frameset with an example.   (3) (March 2017)

7. Write the HTML code to create the following table:

No. of Students	
Science	55
Commerce	60
Humanities	58

   (2) (March 2017)

8. _____ tag in HTML is used to create drop-down list.
   (a) SELECT   (b) OPTION   (c) INPUT   (d) LIST   (1) (SAY 2017)

9. Write an HTML code to create the following table:

PAY ROLL		
EMPNO	NAME	SALARY
101	ABIN	15,000
102	SINI	25,000
103	ANU	20,000

   (3) (SAY 2017)

Questions from Previous Years' Question Papers (Computer Science)

1. The <DD> tag gives _____.   (1) (March 2016)

2. Create a table with 5 types of fruit names, use headings as serial number, name and cost.   (5) (March 2016)

3. Create an ordered list of five fruits using small Roman numerals.   (5) (March 2016)

4. Write an HTML code to display a list of hardware and software of a company in the following format:
   I.   Hardware
        1. Cables
             (i)   UTP
             (ii)   Coaxial
             (iii)   Fiberoptic

      2. Storage Devices
        (i)   USB
        (ii)   HardDisk
        (iii)   Tape
  II.   Software
      1. Application Software
        (i)   MS Office
        (ii)   Inventory Management System
      2. System Software
        (i)   Compilers
        (ii)   Assemblers   (5) (SAY 2016)

5. Write an HTML code to display a user registration form as shown below:

                                                (5) (SAY 2016)

6. A link to a particular section of the same document is called _____.   (1) (March 2017)

7. Create a web page using frames for Tourism department showing list of tourist places in Kerala. When a place is selected a detailed description should be available in a separate window.   (5) (March 2017)

8. Create a form that accepts information regarding a student. Fields necessary are name, age, class, sex, roll number, hobbies and date of birth. Use appropriate form controls.   (5) (March 2017)

9. Which HTML tag is used to create ordered list?   (1) (SAY 2017)

10. Write an HTML code for a web page to show the following details in blue background:

    Components of a Computer
- Hardware
  1. RAM
  2. ROM
  3. Hard Disk
- Software
  1. System Program
  2. Application Program   (3) (SAY 2017)

11. <FORM> tag contains some other tags to facilitate interaction between user and web page. Write any two control tags and explain their mode of interaction. (2) (SAY 2017)