Unit 9: Internet

Introduction

This learning unit provides information on Internet, email, web browsers and basic elements of Web page design and layout. Evolution history of Internet, advantages and way to access Internet are covered in Lesson 1. World Wide Web, Some common terminologies and Email communication system has been described in Lesson 2. In particular, Lesson 3 discussed about the web browser. Introduction to some basic design ideas and elements of web page design, text, colour, graphics and assembling them as layout are described in Lesson 4. Lessons 5 of this unit are devoted to the table and frame design. Lesson 6 explains a combination of theory and practical hands-on activities.

Lesson 1: Beginning with Internet

1.1. Learning Objectives

On completion of this lesson you will be able to learn:

♦   what is Internet?
♦   history of Internet
♦   advantage of Internet
♦   how to access Internet.

1.2. What is Internet?

The Internet is a vast network that connects many independent networks spanning over 170 countries in the World. It links computers of many different types, sizes, and operating systems, and, of course, the many people of those countries that use the Internet to communicate.

The one thing all these different computers have in common is the use of the Internet Protocol, abbreviated as IP, which allows computers of different types to communicate with each other. We will often see reference to the longer abbreviation, TCP/IP, which stands for Transmission Control Protocol/Internet Protocol. Your own computer uses TCP/IP software to enable it to link to this service.

No organization, corporation or government owns or runs the Internet. Instead, many people and organizations voluntarily participate in task force groups who meet to develop standards for the many various technical needs of running the Internet. Decisions are made by consensus

among all who choose to participate, and every point of view is heard in the long process of hashing out decisions and setting new standards.

1.3. History of Internet

The Internet was the result of some visionary thinking by people in the early 1960s who saw great potential value in allowing computers to share information on research and development in scientific and military fields. J.C.R. Licklider of MIT, first proposed a global network of computers in 1962, and moved over to the Defense Advanced Research Projects Agency (DARPA) in late 1962 to head the work to develop it.

In 1966 Lawrence Roberts of MIT developed his plan for ARPANET. These visionaries and many more left unnamed here are the real founders of the Internet. The Internet, then known as ARPANET, was brought online in 1969 under a contract let by the renamed Advanced Research Projects Agency (ARPA) which initially connected four major computers at universities in the southwestern US (UCLA, Stanford Research Institute, UCSB, and the University of Utah).

The Internet was designed in part to provide a communications network that would work even if some of the sites were destroyed by nuclear attack. If the most direct route was not available, routers would direct traffic around the network via alternate routes.

The early Internet was used by computer experts, engineers, scientists, and librarians. There was nothing friendly about it. There were no home or office personal computers in those days, and anyone who used it, whether a computer professional or an engineer or scientist or librarian, had to learn to use a very complex system.

The Internet matured in the 70's as a result of the TCP/IP architecture first proposed by Bob Kahn at BBN and further developed by Kahn and Vint Cerf at Stanford and others throughout the 70's. It was adopted by the Defense Department in 1980 replacing the earlier Network Control Protocol (NCP) and universally adopted by 1983.

1.4. Advantage of Internet

The Internet makes it possible for us to communicate in various ways and enables exchange of information and files. The most common things we can do are:

- Get information on almost any subject by searching the web. It takes some skill to search efficiently. Since anyone can publish just about anything, there is lots of misinformation on the web too.

- Send and receive email or chat or exchange messages with people all over the world. Almost as fast as the telephone, there is never a busy signal, and you never play phone tag.

- Join discussion groups about a common subject with message boards, Newsgroups and email discussion lists.

- Get or exchange software and files with the File Transfer Protocol (FTP)

- Explore the World Wide Web, which can use all of the above, and adds easy links to other resources and adds multimedia--graphics, sound, and video capabilities.

- Publish your own material on the web in blogs, message boards, or your own web pages.

1.5. How to Access Internet

Internet access refers to the means by which users connect to the Internet. Common methods of internet access include dial-up, landline (over coaxial cable, fiber optic or copper wires), T- lines, Wi-Fi, satellite and cell phones.

Typical home user connection

- Dial-up

- DSL

- Broadband wireless access

- Cable modem

- ISDN

Typical business connection

- DSL

- SHDSL

- Ethernet technologies

Dial-up modems are generally only capable of a maximum bit rate of 56 kbit/s (kilobits per second) and require the full use of a telephone line—whereas broadband technologies supply at least double this speed and generally without disrupting telephone use.

Broadband Internet access, often shortened to just "broadband", is high-speed Internet access—typically contrasted with dial-up access over a modem. Various minimum speeds have been used in definitions of broadband, ranging up from 64 kbit/s up to 1.0 Mbit/s.

An Internet service provider (abbr. ISP, also called Internet access provider or IAP) is a business or organization that provides consumers or businesses access to the Internet and related services. In the past, most ISPs were run by the phone companies. Now, ISPs can be started by just about any individual or group with sufficient money and expertise.

1.6.   Exercise

1.   Multiple choice questions

1.   IP stands for

a)   Information Protocol
b)   Internet Protocol
c)   Information Processing
d)   Internet Processing.

2.   Internet was the result of some visionary thinking in the early
       1960s by

a)   Lawrence Roberts
b)   Kahn
c)   Vint Cerf
d)   J.C.R. Licklider.

3.   Which of the following is not a typical home user connection to
       access Internet?

a)   Dial-up
b)   DSL
c)   Broadband wireless access
d)   Ethernet technologies.

4.   ISP Stands for

a)   Internet Service Provider
b)   Internet Service Protocol
c)   Information Service Provider
d)   Internet Server Provider.

2.   Short questions

1.   What is Internet?
2.   Who are the users of Internet?
3.   What do you mean by Broadband Internet access?

3.   Analytical questions

1.   Write down the history of Internet.
2.   State the advantages of using Internet.
3.   Discuss method of Accessing Internet.

Lesson 2: World Wide Web (WWW)

2.1. Learning Objectives

On completion of this lesson you will be able to learn:

♦ common terminologies
♦ email communication.

2.2. Common Terminologies

Computer Network: A network is an interconnection of different computing devices. These may include Desktop PC's, Servers, Routers, Switches and also non traditional devices such as Personal Digital Assistants (PDA), TV's, Mobiles etc. Computer networks may be classified according to the scale: Personal area network (PAN), Local Area Network (LAN), Campus Area Network (CAN), Metropolitan area network (MAN), or Wide area network (WAN).

LAN: A local area network (LAN) is a computer network covering a small geographic area, like a home, office, or group of buildings e.g. a school. The defining characteristics of LANs, in contrast to Wide Area Networks (WANs), include their much higher data transfer rates, smaller geographic range, and lack of a need for leased telecommunication lines.

A network card: A network card, network adapter or NIC (network interface card) is a piece of computer hardware designed to allow computers to communicate over a computer network. It provides physical access to a networking medium and often provides a low-level addressing system through the use of MAC addresses. It allows users to connect to each other either by using cables or wirelessly.

Repeater: A repeater is an electronic device that receives a signal and retransmits it at a higher level or higher power, or onto the other side of an obstruction, so that the signal can cover longer distances without degradation.

Hubs: A hub contains multiple ports. When a packet arrives at one port, it is copied to all the ports of the hub. When the packets are copied, the destination address in the frame does not change to a broadcast address. It simply copies the data to all of the Nodes connected to the hub.

Bridge: A network bridge connects multiple network segments at the data link layer (layer 2) of the OSI model. Bridges do not promiscuously copy traffic to all ports, as hubs do, but learn which MAC addresses are

reachable through specific ports. Once the bridge associates a port and an address, it will send traffic for that address only to that port.

Switch: Switches may distribute traffic on load or by application content (e.g., a Web URL identifier). Switches may operate at one or more OSI layers, including physical, data link, network, or transport (i.e., end-to-end). A device that operates simultaneously at more than one of these layers is called a multilayer switch.

Router: Routers are the networking device that forward data packets along networks by using headers and forwarding tables to determine the best path to forward the packets. Routers work at the network layer of the TCP/IP model or layer 3 of the OSI model. A router is connected to at least two networks, commonly two LANs or WANs or a LAN and its ISP's network.

Protocols: Technical specifications or protocols describe how to exchange data over the network.

OSI: Open Systems Interconnection, a joint ISO and ITU-T standard for computer networks and communication protocols. The OSI reference model was a major advance in the teaching of network concepts. It promoted the idea of a common model of protocol layers, defining interoperability between network devices and software.

Internet Protocol: The Internet Protocol (IP) is a data-oriented protocol used for communicating data across a packet-switched internetwork. IP is a network layer protocol in the Internet protocol suite. As a lower layer protocol, IP provides the service of communicable unique global addressing amongst computers.

Hyperlinks and URL: The World Wide Web is a huge set of interlinked documents, images and other resources, linked by hyperlinks and URLs. These hyperlinks and URLs allow the web-servers and other machines that store originals, and cached copies, of these resources to deliver them as required using HTTP.

HTTP: (Hypertext Transfer Protocol). HTTP is only one of the communication protocols used on the Internet.

Web services: Web services also use HTTP to allow software systems to communicate in order to share and exchange business logic and data.

User Agents: Software products that can access the resources of the Web are correctly termed user agents.

Web Browser: Web browsers, such as Internet Explorer and Firefox access web pages and allow users to navigate from one to another via

hyperlinks. Web documents may contain almost any combination of computer data including photographs, graphics, sounds, text, video, multimedia and interactive content including games, office applications and scientific demonstrations.

File sharing: A computer file can be e-mailed to customers, colleagues and friends as an attachment. It can be uploaded to a Web site or FTP server for easy download by others. It can be put into a "shared location" or onto a file server for instant use by colleagues. The load of bulk downloads to many users can be eased by the use of "mirror" servers or peer-to-peer networks.

Optical Fiber: An optical fiber (or fibre) is a glass or plastic fiber designed to guide light along its length. Optical fibers are widely used in fiber-optic communication, which permits transmission over longer distances and at higher data rates than other forms of communications.

Wireless LAN: Wireless LAN technology is built to connect devices without wiring. These devices use a radio frequency to connect.

Wiki: In the early days, web pages were usually created as sets of complete and isolated HTML text files stored on a web server. More recently, web sites are more often created using content management system (CMS) or wiki software with, initially, very little content.

2.3 Email Communication

First e-mail message was sent in 1971 by an engineer named Ray Tomlinson. Tomlinson's breakthrough was the ability to send messages to other machines on the Internet, using the @ sign to designate the receiving machine.

Email is one of the earliest standard Internet protocols which enable people with different computers and operating systems to communicate with each other. E-mail allows one-to-one or one-to-many mailings. Mail is received and held by a mail server within an organization or by an Internet service provider until the addressee logs on to collect the mail.

An e-mail message has always been nothing more than a simple text message sent to a recipient. In the beginning and even today, e-mail messages tend to be short pieces of text, although the ability to add attachments now makes many messages quite long.

<u>Two ways to access e-mail</u>

1. Through browser by subscribing to free e-mail services like Hotmail or Yahoo.

2. Through Stand-alone clients like Microsoft Outlook, Outlook Express, Eudora.

Characteristics of e-mail access through browser software are as follows,

- Can be accessed anywhere at any PC.

- It is secured as user login every time to check or send mail.

- This page can be speedily opened when server response time is high and internet is available.

Characteristics of e-mail access through stand-alone software are as follows,

- Only can be configured in personal computers. Should not be used in any PC.

- Once configured it checks mail in every few minutes and stores inbox in personal computer's hard disk. Therefore user can view them in convenient time.

- It alert for every incoming mail.

- If email server or internet traffic is slow it is a good alternative to check mails as it checks for new mails when internet traffic is free or server response time is high.

- As it keeps every copy of mails sent or received in local computer therefore, one safe to view any old mail if mail deleted or server is not responding or internet is down for some period.

- All incoming or outgoing mails are scanned with local antivirus application loaded hence mails become virus free.

- Any body other than the PC belongs to the person if uses computer can open outlook express and view sensitive mails. Therefore user must be more careful if he or she allowing someone else to use his or her pc for a while.

No matter which type of client you're using, it generally does four things:

- Shows a list of all of the messages in your mailbox by displaying the message headers. The header shows you who sent the mail, the subject of the mail and may also show the time and date of the message and the message size.

- Let's select a message header and read the body of the e-mail message.

- Let's create new messages and send them. You type in the e-mail address of the recipient and the subject for the message, and then type the body of the message.

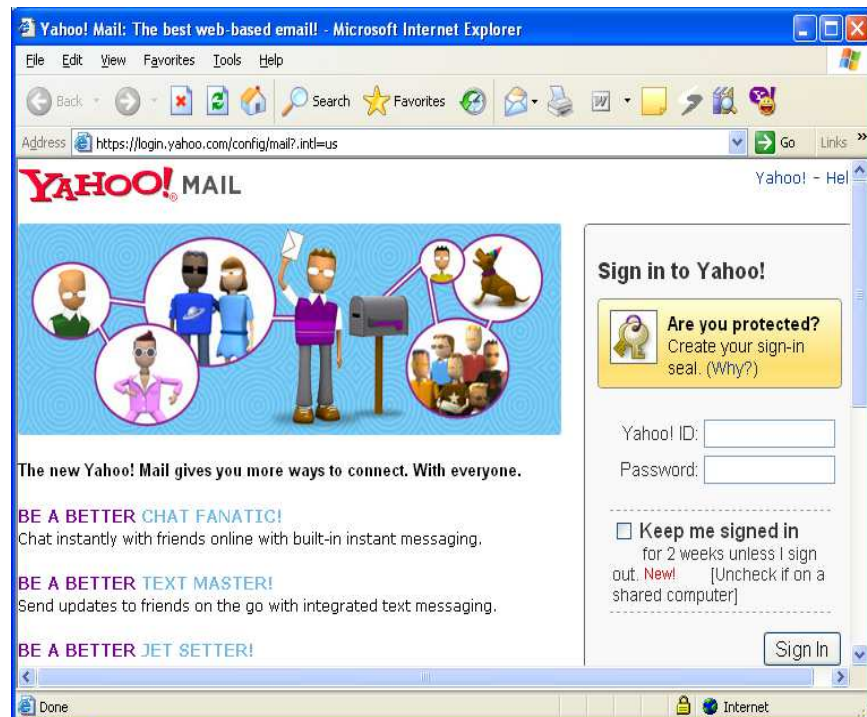- Let's add attachments to messages you send and save the attachments from messages you receive.

The real e-mail system consists of two different servers running on a server machine. One is called the **SMTP server**, where SMTP stands for Simple Mail Transfer Protocol. The SMTP server handles outgoing mail. The other is either a **POP3 server** or an **IMAP server**, both of which handle incoming mail. POP stands for Post Office Protocol, and IMAP stands for Internet Mail Access Protocol.

Email Operation

Here we will see how to access your web mail account. Web mail allows you to open your email at home or at work or from any computer connected to the internet.

For web-based email first you type the URL (https://login.yahoo.com) in your browser window. The screenshot below shows the Yahoo mail web site.

Fig: Yahoo mail web site.

You have to provide **Yahoo ID** and **password** information to access your Yahoo email account. Then press **Sign In** button.

Your Inbox is automatically opened when you log-in. You will have access to all your e-mail messages and folders that exist on the mail server at the time of log-in. If you have created folders, they will be listed on the left hand side. To access those folders, simply click the folder name.
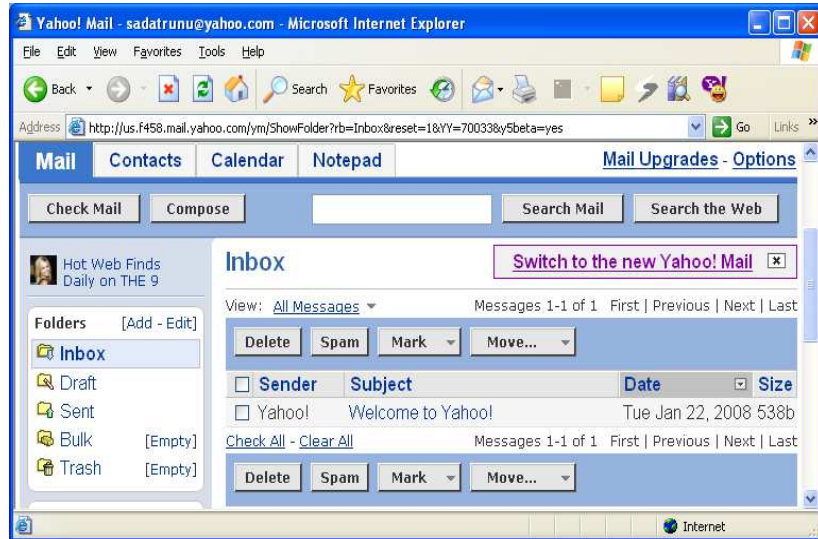

Fig: Yahoo mail Inbox window.

Inbox is automatically opened when you log-in. You will have access to all your e-mail messages and folders that exist on the mail server at the time of log-in. If you have created folders, they will be listed on the left hand side. To access those folders, simply click the folder name. Note: If you are using IMAP, you will have access to all your folders and e-mail messages that you have stored on our e-mail server via this method. The same folders and e-mail messages will be visible to you in your e-mail program.

Yahoo mail saves incoming messages in the **Inbox** and outgoing messages in the **Sent** box. You will need to create a folder by clicking **Add.**

To write a new e-mail, click **Compose.**

To forward a message, open the message first and then click the **Forward** button.
To delete a message(s), put a checkmark next to the message(s) and click **Delete**.

When you click the **Compose** button, you will see following screen in your browser window.
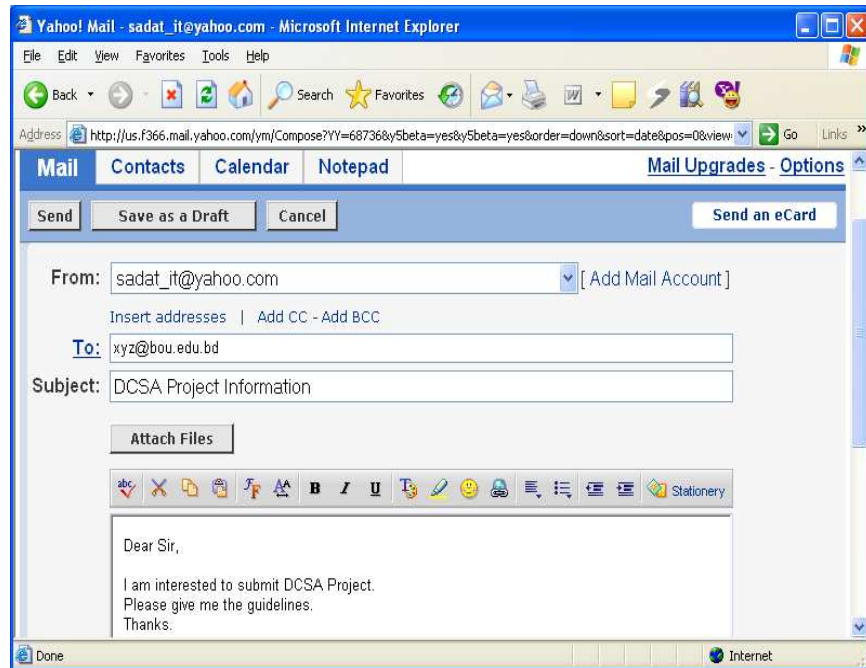

Fig: Yahoo mail Compose window.

Enter the recipients full e-mail address in the 'To:', 'cc', or 'Bcc' field.

- Enter a Subject (optional).
- Type your message.
- Click to check for any misspelled words.
- Attach a file(s) (optional).
- Click the **Send** button to send the message.

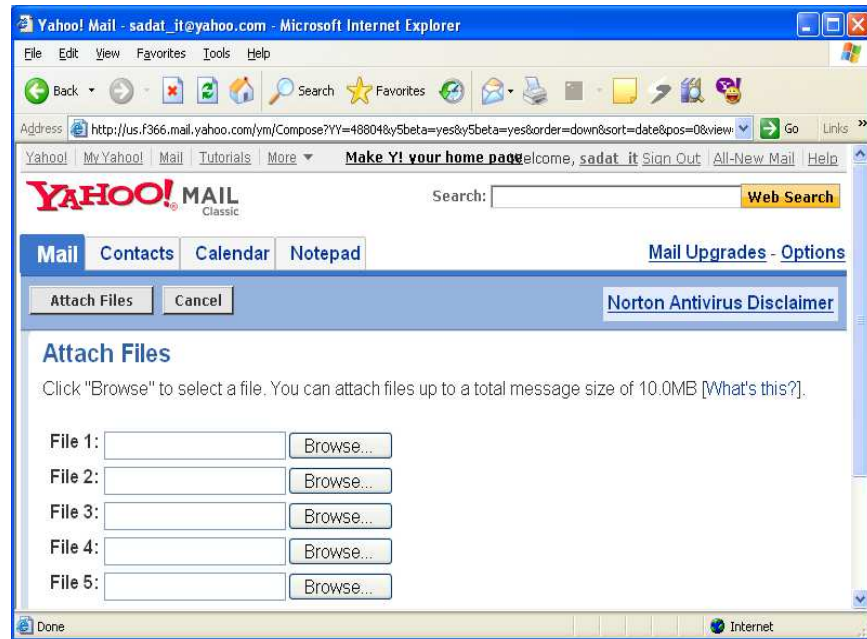When you click the **Attach files** button, you will seed following window,

Fig: Yahoo mail attach File window.

By clicking the **Browse** button, select the file(s) you want to attach and then select **Attach files** button.

To read an e-mail, simply click on the message. The message will open in the browser window. From the Read Message window, you can reply, forward, delete, print, go to previous/next message in the current folder, or save senders/recipients e-mail addresses in the Webmail Address Book. Simply click the appropriate button.

To **Add New Contacts** just select a new contact in the address book, enter the person's information.

Logging Out: When you are ready to log out of Webmail, click on **Sign Out** button, located on the top of the web page.

2.4.   Exercise

1.   Multiple choice questions

1.   A local area network (LAN) is a computer network covering

a)   campus area
b)   metropolitan area
c)   a small geographic area
d)   wide area.

2.   A network bridge connects multiple network segments at

a)   the network layer
b)   the data link layer
c)   the physical layer
d)   the session layer.

3.   Which of the following sign is used to designate email address?

a)   //
b) $
c)   &
d)   @.

4.   Which of the following server handles outgoing mail?

a)   IMAP server
b)   POP3 server
c)   Samba server
d)   SMTP server.

2.   Short questions

1.   What is the function of a network card?
2.   What are the functions of repeaters and hub?
3.   Write down the characteristics of Bridge, Switch and router.

3.   Analytical questions

1.   State the characteristics of accessing Email through browser software.
2.   State the characteristics of accessing Email through stand-alone software.
3.   Write down process of sending mail from your web mail account.

Lesson 3: Web Browsers

3.1. Learning Objectives

On completion of this lesson you will be able to learn:

- web browser
- how do browsers work
- features of browsers
- microsoft Internet Explorer.

3.2. Web Browser

A **web browser** is a software application that enables a user to display and interact with text, images, videos, music and other information typically located on a Web page at a website on the World Wide Web or a local area network. Most commonly used web browsers are,

- Internet Explorer
- Firefox
- Safari
- Opera
- Netscape
- Mozilla

3.3. How do Browsers Work?

Web browsers communicate with Web servers primarily using HTTP (hypertext transfer protocol) to fetch WebPages. HTTP allows Web browsers to submit information to Web servers as well as fetch Web pages from them. The text document contains special instructions (usually written in HTML) that tell the browser how to display the document on the user's screen. The instructions may include references (hyperlinks) to other web pages, information about text formatting and color, and position information for images contained in the document. The most commonly used HTTP is HTTP/1.1.

Pages are located by means of a URL (uniform resource locator), which is treated as an address, beginning with *http:* for HTTP access. Many browsers also support a variety of other URL types and their corresponding protocols, such as *gopher:* for Gopher (a hierarchical hyperlinking protocol), *ftp:* for FTP (file transfer protocol), *rtsp:* for RTSP (real-time streaming protocol), and *https:* for HTTPS (an SSL encrypted version of HTTP).

The file format for a Web page is usually HTML (hyper-text markup language) and is identified in the HTTP protocol using a MIME *content type*. Most browsers natively support a variety of formats in addition to HTML, such as the JPEG, PNG and GIF image formats, and can be extended to support more through the use of plug-in. The combination of HTTP *content type* and URL protocol specification allows Web page designers to embed images, animations, video, sound, and streaming media into a Web page, or to make them accessible through the Web page.

Text and images on a Web page can contain hyperlinks to other Web pages at the same or different website. Web browsers allow a user to quickly and easily access information provided on many Web pages at many websites by traversing these links. Web browsers format HTML information for display, so the appearance of a Web page may differ between browsers.

3.4. Features of Browsers

Browsers are the software that allows you to access the World Wide Web. Most browsers contain the following features. Some of these may be presented as buttons (or icons) in a toolbar. If you don't find a button, you will find a menu item in one of the menus provided. You can usually customize the toolbar to include any or all of these features:

Address Field

This area is where the URL (web page address) for the web page is displayed or entered. In many browsers, there's a little downward facing arrow next to this field. When you click on the arrow you will see a list of recently visited websites. Clicking one of these URLs will take you to that website. You can also enter a URL into this field and then press enter or return to go to the website. In some browsers there is a "Go" button next to this field that initiates a server request after typing in a URL. By the way, you don't usually have to type in the "http://" part of the URL. Most browsers will add that information in for you when you press enter or return.

Back Button

Use this button to go back to the previous page opened in this particular browser window. In some browsers, holding the mouse down on this button produces a menu of previous pages that you can then choose from. In other browsers, there's a little arrow next to the Back button that produces this menu.

Bookmarks or Favorites

You can easily create a shortcut to your favorite web pages by using the Bookmark (or Favorites) menu or button. This is a very important feature and it works a little differently in each browser. In Internet Explorer, use the Favorites Menu to Add to Favorites. You can then use the Organize Favorites menu item to place your bookmark in a folder or particular place in the list. In Netscape, FireFox and Safari, choose Add Bookmark from the Bookmark menu. You can then choose Show All or Manage Bookmarks to create folders and/or rearrange your bookmarks. In most browsers you can also place favorite websites to an area just above the main browser window.

Close Box

This button in the upper right corner of the window will close the browser window. If there is only one browser window open, the program will exit. One way to tell if you have more than one browser window open is to look at the button bar at the bottom of the screen. If you see more than one button with the icon of the browser you are using, you can switch between the open windows by clicking on these buttons. Another way to deal with multiple windows is to minimize or Restore the window to its pre-maximized size. On the Macintosh, there's a similar button, but separate windows are more obvious and closing the last one does not quit the browser.

Fonts or Larger or Smaller

In Internet Explorer a button called Fonts gives you a menu to choose the size of the text displayed in the browser window. Some browsers offer two buttons, Larger and Smaller to change the size of the text.

Forward Button

Like the Back button, the Forward button takes you to pages that you have previously seen in a particular browser window. The Forward button is only available if you have used the Back button and want to go forward to where you were before. In some browsers, holding the mouse down on this button produces a menu of previous pages, which you can then choose from. In other browsers, there's a little arrow next to the Forward button that produces this menu.

History Button

Most browsers offers a History button or menu item which allows you to look at the last several hundred web pages you've been to, and select one of them for an easy return path.

Home Button

This button takes you to the page that has been designated as your "home" page. You can select your "home page" in the browser's Preferences (or Internet Options) section.

Favorites, Links or Personal Toolbar

You can add your own buttons to this toolbar. In Explorer it is called Favorites or Links Toolbar and in Netscape it is called the Personal Toolbar. These toolbars can be hidden or shown by using the View menu.

Maximize Button

In Windows you can use this button to make the browser's window enlarge to full screen. When the window is already maximized this button is replaced by the Restore button.

Menubar

In Windows the Menubar is a part of each browser window. Choices include File, Edit, View, History, Favorites or Bookmarks and Help. On the Macintosh, these Menus are always at the top of the screen.

Minimize Button

In Windows you can use this button to make the browser's window disappear from the screen. You can restore the window by clicking its button on the bottom of the screen.

Print Button

You can print any web page by clicking this button.

Reload or Refresh Button

If you suspect the contents of a browser's window may have changed since the last time you viewed it, you should click the Reload or Refresh button to update the page.

Restore Button

If the browser's window is maximized you can use this button to restore the size of the window so that it no longer fills the entire screen. This is very useful if you want to see more than one window at the same time.

Search Button or Field

In some older browsers there is a button to go to the page you have designated as your "search" page. You can select your "search page" in the browser's preferences section or by clicking the "Choose a Search Engine" button in the Search window. Most browsers now have a search field, at the right end of the main button bar, which you can type into to perform Internet searches.

Security Indicators

Most browsers show a padlock icon in the lower left corner of the window to indicate a secure connection. This means that data being sent or received from that server is encrypted and would be extremely difficulty for a third party to access. If this padlock is in the locked position, you know you have a secure server connection. If the padlock is unlocked, then you do not. Another way to tell is by the URL or web site address. If the URL begins with https:// then the server connection is secure.

Status Bar

The bar along the bottom of the browser's window shows you what is being loaded into the browser window at the moment or the URL of the link your mouse is over. There is usually also a progress indicator that shows how much of a file has already been downloaded.

Stop Button

Use this button if you want to stop loading the contents of a page.

Window Title

The title of the web page appears in the browser window's title. Sometimes pages don't have titles. When you bookmark a page, the window's title is used to identify the bookmark.

3.5. Microsoft Internet Explorer
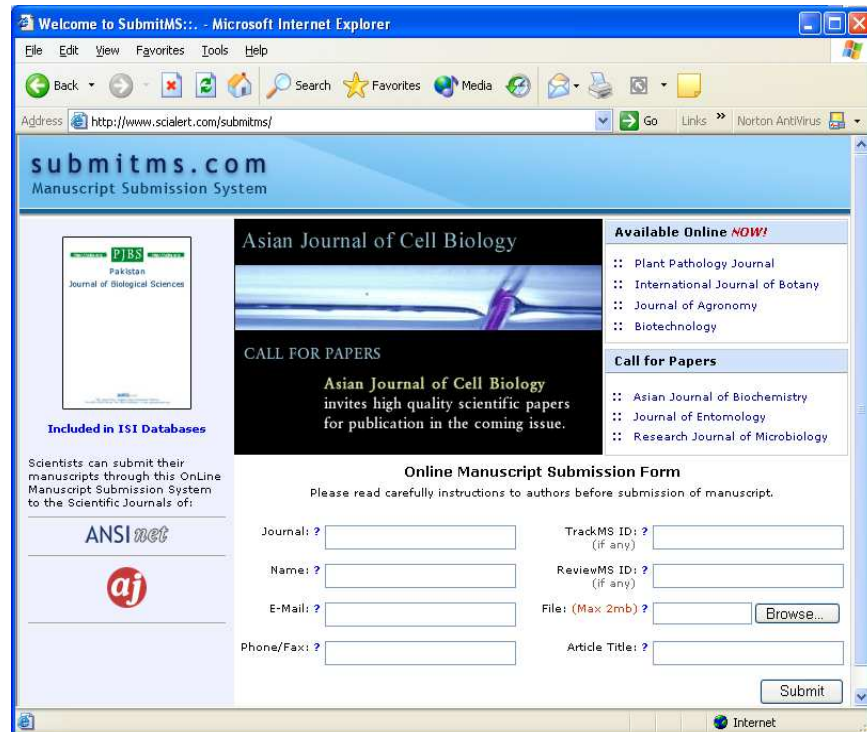
Here is a screenshot of the Microsoft Internet Explorer.

Fig: An Online Journal webpage.

3.6.   Exercise

1.   Multiple choice questions

1.   Which of the following is not a web browser?

a)   Firefox
b)   Safari
c)   Gopher
d)   Opera.

2.   FTP stands for

a)   File Transmission Protocol
b)   File Transfer Protocol
c)   File Transmission Process
d)   File Transfer Process.

3.   You can easily create a shortcut to your favorite web pages by using

a)   home Button
b)   history Button
c)   refresh Button
d)   bookmark Button.

2.   Short questions

1.   What is the function of a Web Browser?
2.   What types of information are contained in Web pages?

3.   Analytical questions

1.   State how browser works.
2.   Write down the features of a browser.