

VI-SEM –CSE(MODEL QUESTION PAPER-2)
CST-602-INTERNET & WEB TECHNOLOGY

FULL MARK : 80

Time: 3hrs

Answer any Five including Q.no.1 &2
 Figures in the right hand margin indicates marks

1.	Answer ALL questions.	(2X10)
(a)	Define visual Markup.	
(b)	What is WWW ?.	
(c)	What is the name of protocol to access the web.	
(d)	Define protocol?	
(e)	Define browser.	
(f)	What is a client.	
(g)	Define checksum?	
(h)	What is internet protocol.	
(i)	What is function of a TCP header.	
(j)	What is a network.	
2.	Answer any SIX questions	(5X6)
(a)	Explain the connectionless datagram delivery?	
(b)	What is IRC? Explain the functions of channel.	
(c)	What is timeout and retransmission? Explain with diagram.	
(d)	Explain FTP client server model with suitable diagram.	
(e)	Explain how the idea behind sliding window improves the system.	
(f)	Describe the functions of Telnet protocol.	
(g)	Write the properties of reliable delivery services	
(h)	Differentiate between VB-script and JAVA-script.	
3.	Define E-mail. Explain format of an E-mail message.	(10)
4.	Explain internet layering of TCP/IP with suitable diagram.	(10)
5.	Explain in details working of search engine	(10)
6.	What is a subnet ? Explain Routing in presence of internet.	(10)
7.	Write shot notes on any TWO	(5X2)
	a) IMAP. (c) POP3.	
	b)WWW (d) Browsers	

VI-SEM –CSE(MODEL ANSWER PAPER-2)
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1.

a. It means the markup used to store the text is a logical markup. This means that every convention used is aimed to represent the logical structure of the document, not the way it is rendered on a PDF or on an HTML page

b. The World Wide Web (WWW) is a network of online content that is formatted in HTML and accessed via HTTP. The term refers to all the interlinked HTML pages that can be accessed over the Internet.

c. Http protocol is used to access the web.

d. It is the set of rules or procedures for transmitting data between electronic devices, such as computers.

e. Browser," is an application used to access and view websites. Common web browsers include Microsoft Internet Explorer, Google Chrome, Mozilla Firefox, and Apple Safari.

f. A client is a computing device that initiates contact with a server in order to make use of a shareable resource.

g. TCP includes checksum field in the TCP header to detect the risk of errors being introduced into a TCP segment during its travel across the inter-network or in simple words TCP wants to check if the segment got corrupted(intentionally or unintentionally) while segment was on traveling in order to reach the destination.

h. IP stands for Internet Protocol, which is a set of standard predefined rules used to govern the way data packets are sent over the internet. For two devices to communicate, they must be able to find each other. For two devices to find each other, their locations must be known to each other.

i. The Transmission Control Protocol (TCP) header is the first 24 bytes of a TCP segment that contains the parameters and state of an end-to-end TCP socket. The TCP header is used to track the state of communication between two TCP endpoints.

j. A network is a group of computers linked to each other that enables the computer to communicate with another computer and share their resources, data, and applications.

2.

a. A Connectionless service is a data communication between two nodes where the sender sends data without ensuring whether the receiver is available to receive the data. Here, each data packet has the destination address and is routed independently irrespective of the other packets. Thus the data packets may follow different paths to reach the destination. There's no need to setup connection before sending a message and relinquish it after the message has been sent. The data packets in a connectionless service are usually called datagrams.

Protocols for connectionless services are –

- Internet Protocol (IP)
- User Datagram Protocol (UDP)
- Internet Control Message Protocol (ICMP)
-

Advantages of Connectionless Services

- It has low overhead.
- It enables to broadcast and multicast messages, where the sender sends messages to multiple recipients.
- It is simpler and has low overhead.
- It does not require any time for circuit setup.

- In case of router failures or network congestions, the data packets are routed through alternate paths. Hence, communication is not disrupted.

Disadvantages of Connectionless Services

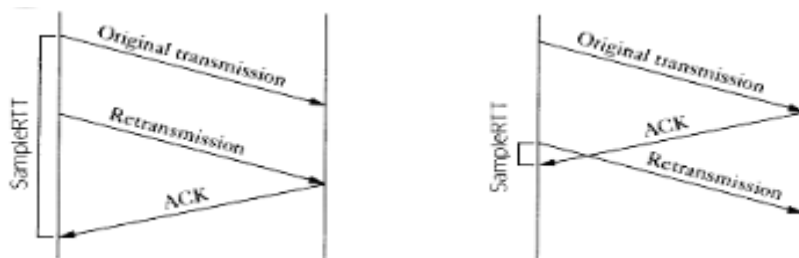
- It is not a reliable connection. It does not guarantee that there will not be a loss of packets, wrong delivery, out of sequence delivery or duplication of packets.
- Each data packet requires longer data fields since it should hold all the destination address and the routing information.
- They are prone to network congestions.

b. IRC stands for Internet Relay Chat which is one of the main communication channels for open source projects. It operates on a client/server model where individuals use a client program to connect to an IRC server. A channel is a specific chat group within an IRC network where users can talk to each other.

The basic means of communicating to a group of users in an established IRC session is through a Channels on a network can be displayed using the IRC command which lists all currently available channels. IRC has a line-based structure. Clients send single-line messages to the server receive replies to those messages and receive copies of some messages sent by other clients. In most clients, users can enter commands by prefixing them with Depending on the command, these may either be handled entirely by the client, or (generally for commands the client does not recognize) passed directly to the server, possibly with some modification.

c. TCP handles this by setting a timeout when it sends data, and if the data isn't acknowledged when the timeout expires, it retransmits the data. A critical element of any implementation is the timeout and retransmission strategy. TCP manages four different timers for each connection.

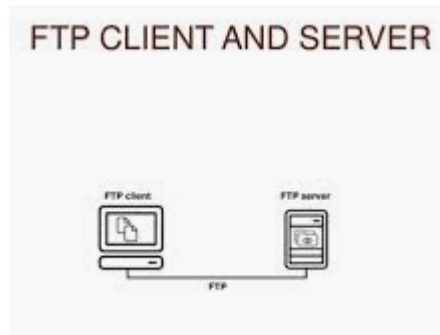
1. A retransmission timer is used when expecting an acknowledgment from the other end. This chapter looks at this timer in detail, along with related issues such as congestion avoidance.
2. A persist timer keeps window size information flowing even if the other end closes its receive window describes this timer.
3. A keepalive timer detects when the other end on an otherwise idle connection crashes or reboots describes this timer.
4. A 2MSL timer measures the time a connection has been in the TIME_WAIT state.



TCP (the Transmission Control Protocol) connects network devices to the internet. When an outbound segment is handed down to an IP and there's no acknowledgment for the data before TCP's automatic timer expires, the segment is retransmitted.

d. FTP stands for File Transfer Protocol and, as the name implies, it is a way of transferring files between computers.

A File Transfer Protocol client (FTP client) is a software utility that establishes a connection between a host computer and a remote server, typically an FTP server. An FTP client provides the dual-direction transfer of data and files between two computers over a TCP network or an Internet connection. An FTP client works on a client/server architecture, where the host computer is the client and the remote FTP server is the central server.



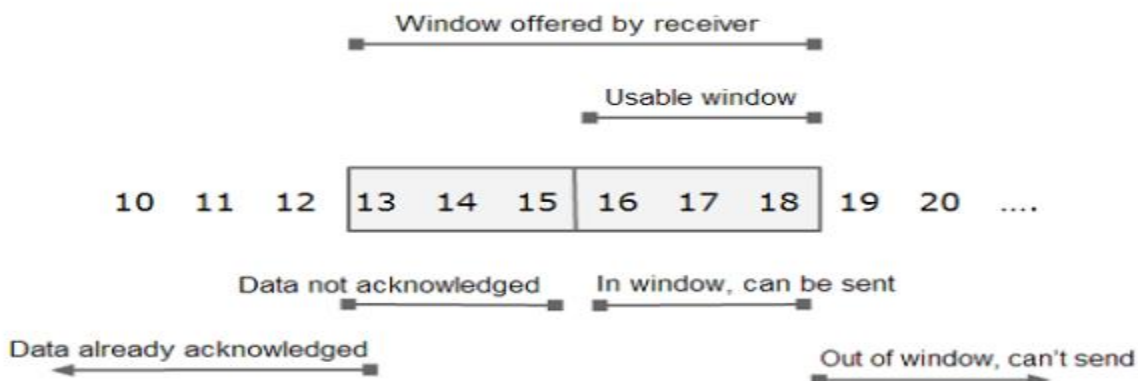
An FTP client primarily provides a reliable means to transfer data between a local and remote host. It works when the host computer connects to the FTP server by specifying the domain, IP address, username and password of that server. After the user authentication, a connection is established between both systems, and the host computer can upload data onto the FTP server. An FTP client generally supports one or multiple simultaneous file transfers. Moreover, most FTP clients have the ability to connect to multiple FTP servers simultaneously, providing status updates of the uploading process, and notifications about successful and failed transfers. Besides uploading, the host computer can also download files from the FTP server using the FTP client. An FTP server is a computer which has a file transfer protocol (FTP) address and is dedicated to receiving an FTP connection.

An FTP server needs a TCP/IP network for functioning and is dependent on usage of dedicated servers with one or more FTP clients. In order to ensure that connections can be established at all times from the clients, an FTP server is usually switched on. An FTP server is an important component in FTP architecture and helps in exchanging of files over internet.

e. The sliding window method ensures that traffic congestion on the network is avoided. The application layer will still be offering data for transmission to TCP without worrying about the network traffic congestion issues as the TCP on sender and receiver side implement sliding windows of packet buffer.

This window covers unacknowledged data and the data it can send keeping in mind the window size advertised by the receiver.

Following figure should give you an idea about how a sliding window looks like :



In the figure shown above :

- The available window advertised by the receiver is 6. This means that receiver can accept 6 bytes as of now.
- The window at sender side covers bytes ranging from 13 to 18 (I.e. 6 bytes in total).
- Out of this range, 13-15 are the bytes which have been sent but no acknowledgement is yet received for them.
- Bytes 16-18 are the bytes that sender can send as soon as possible.
- If sender starts receiving acknowledgement for bytes 13 to 15, the left end of the window starts closing in.

f. Telnet is a client-server protocol, based on a reliable connection-oriented transport. Typically, this protocol is used to establish a connection to Transmission Control Protocol (TCP) port number 23.

It has the following features:

- TELNET is a general protocol, meant to support logging in from almost any type of terminal to almost any type of computer.
- It allows a user at one site to establish a TCP connection to a login server or terminal server at another site.
- A TELNET server generally listens on TCP Port 23.

The TELNET client is started on the local machine (if it isn't already running). That client establishes a TCP connection with the TELNET server on the destination system. Once the connection has been established, the client program accepts keystrokes from the user and relays them, generally one character at a time, to the TELNET server. The server on the destination machine accepts the characters sent to it by the client, and passes them to a terminal server. A "terminal server" is just some facility provided by the operating system for entering keystrokes from a user's keyboard. The terminal server treats the remote user as it would any other user logged in to the system, including relaying commands to other applications. The terminal server passes outputs back to the TELNET server, which relays them to the client, which displays them on the user's screen.

g. Properties of Reliable Delivery Service

1. Stream Orientation: Stream delivery service on destination passes to the receiver exact same sequence of bytes that the sender passes it to the source.
2. Virtual Circuit Connection: Protocol software on both the ends communicate by verifying that the transfer is authorized and both sides are ready. Once all details have been settled, the protocol modules inform the application programs that the connection has been established and that transfer can begin.
3. Buffered transfer : When transferring data, each application uses whatever size pieces it finds convenient, which can be as small as a single octet.
4. Unstructured stream : Application programs using the stream service must understand stream content and agree on stream format before they initiate a connection.
5. Full duplex connection : A full duplex connection consists of two independent streams flowing in opposite directions, with no apparent interaction. The advantage of a full duplex connection is that the underlying protocol software can send control information for one stream back to the source in datagrams carrying data in the opposite direction. Such piggybacking reduces network traffic.

h. JavaScript is used as a client-side scripting language whereas VBScript can be used as both server-side and client-side scripting language. JavaScript uses the same operator for different operations whereas VBScript uses different operators for different operations.

Difference between VBScript and JavaScript

S.No	VBScript	JavaScript
1	Definition: VBScript is an Active Scripting language, which uses the Component Object Model to access elements of the environment within which it is running.	Definition: JavaScript is an object-oriented scripting language used to enable programmatic access to objects within both the client application and other applications.
2	Who developed ? VBScript is developed by Microsoft.	Who developed ? JavaScript is developed by Netscape.
3	Client-side / Server-side scripting language: It is both Client and server side scripting language.	Client-side / Server-side scripting language: It is client side scripting language.
4	Case sensitive or not: It is not case sensitive.	Case sensitive or not: It is case sensitive.
5	Runs on which browser ? VBScript runs only on IE	Runs on which browser ? Javascript runs on any browser

3. It is defined as the transmission of messages over communications networks. Some electronic mail systems are confined to a single computer system or network, but others have gateways to other computer systems, enabling users to send electronic mail anywhere in the world. Email is now one of the most commonly used forms of communication, along with text messages, phone calls, and instant-messaging applications. Corresponding with email has been so common that many people have forgotten how to properly create one. A well-composed email reflects professionalism and sincerity in the message it conveys, so it is absolutely necessary that one should know how to format an email message. Before sending your email, make sure that your purpose is made clear. The purpose of your email should be expressed in the body, and the context of which must be reflected in the subject line. Otherwise, your recipient might interpret your email message differently.

Next, double check the email address of your recipient. Accidentally adding characters to the original address may cause the email to bounce back to you, or worse, be sent to another person. Finally, secure a good email signature. Although you may have already mentioned your personal details on the body, this can still be emphasized through your signature. This usually contains your job title and contact details. There are four key elements of a formal email that you must take note of, namely the subject line, the salutation, the body, and the signature.

Subject line: This section provides a glimpse of the email's content. It's best to keep this line short and specific.

Salutation: The greeting should address your recipient properly. It would be best to include the name of your recipient in this section.

Body: You have to be straight to the point with your message. Try not to lose focus of the email's purpose.

Signature: Although this is optional, most people include a signature to provide the sender's personal information.

4.

TCP/IP that is Transmission Control Protocol and Internet Protocol was developed by Department of Defence's Project Research Agency (ARPA, later DARPA) as a part of a research project of network interconnection to connect remote machines.

The features that stood out during the research, which led to making the TCP/IP reference model were:

- Support for a flexible architecture. Adding more machines to a network was easy.
- The network was robust, and connections remained intact until the source and destination machines were functioning.

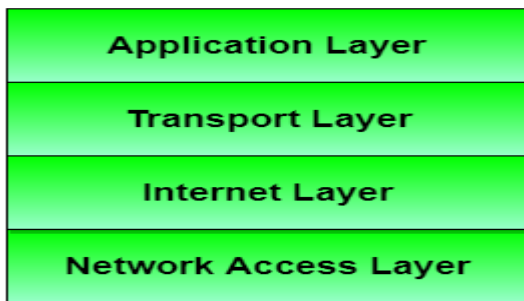
The overall idea was to allow one application on one computer to talk to (send data packets) another application running on different computer.

Layer 1: Host-to-network Layer

1. Lowest layer of the all.
2. Protocol is used to connect to the host, so that the packets can be sent over it.
3. Varies from host to host and network to network

Layer 2: Internet layer

1. Selection of a packet switching network which is based on a connectionless internetwork layer is called a internet layer.
2. It is the layer which holds the whole architecture together.
3. It helps the packet to travel independently to the destination.
4. Order in which packets are received is different from the way they are sent.
5. IP (Internet Protocol) is used in this layer.
6. The various functions performed by the Internet Layer are:
 - Delivering IP packets
 - Performing routing
 - Avoiding congestion



Layer 3: Transport Layer

1. It decides if data transmission should be on parallel path or single path.
2. Functions such as multiplexing, segmenting or splitting on the data is done by transport layer.

3. The applications can read and write to the transport layer.
4. Transport layer adds header information to the data.
5. Transport layer breaks the message (data) into small units so that they are handled more efficiently by the network layer.
6. Transport layer also arrange the packets to be sent, in sequence.

Layer 4: Application Layer

The TCP/IP specifications described a lot of applications that were at the top of the protocol stack. Some of them were TELNET, FTP, SMTP etc.

1. **TELNET** is a two-way communication protocol which allows connecting to a remote machine and run applications on it.
2. **FTP**(File Transfer Protocol) is a protocol, that allows File transfer amongst computer users connected over a network. It is reliable, simple and efficient.
3. **SMTP**(Simple Mail Transport Protocol) is a protocol, which is used to transport electronic mail between a source and destination, directed via a route.

5.

Search Engines are now part of our daily life, whether it be carrying out research . People are now becoming more and more dependent on search engines to get the answer for their everyday queries. At Inspire we monitor our search traffic using a variety of analytics. Most of our queries returned are related to what we do and some are simply bizarre. Those we're interested in relate to the services of what we do e.g improving search ranking, web design, web development, and many more.

List of Top 6 Best Search Engines in The World:

1. Google: Google Search Engine is the best search engine in the world and it is also one of most popular products from Google. Almost 70 percent of the Search Engine market has been acquired by Google.
2. Bing: It is Microsoft's answer to Google and it was launched in 2009. Bing is the default search engine in Microsoft's web browser. At Bing, they are always striving to make it a better search engine but it's got a long way to go to give Google competition.
3. Yahoo: Yahoo & Bing compete more with each other than with Google. A recent report on netmarketshare.com tells us that Yahoo have a market share of 7.68 percent. Although a leader as a free email provider, this is declining significantly though with their recent acknowledgement that User Details & Passwords were hacked last year.
4. Baidu: It is the most used search engine in China and was founded in Jan, 2000 by Chinese Entrepreneur, Eric Xu. This web search is made to deliver results for website, audio files and images. It provides some other services including maps, news, cloud storage and much more.
5. AOL: Aol.com is also among the top search engines. These are the guys that used to send out CD's which you'd load onto your PC to install their browser and modem software.
6. Ask.com: Founded in 1995, Ask.com, previously known as Ask Jeeves. Their key concept was to have search results based on a simple question and answer web format. It is a question & answer

community where you can get the answers for your question and it integrates a large amount of archive data to answer your question.

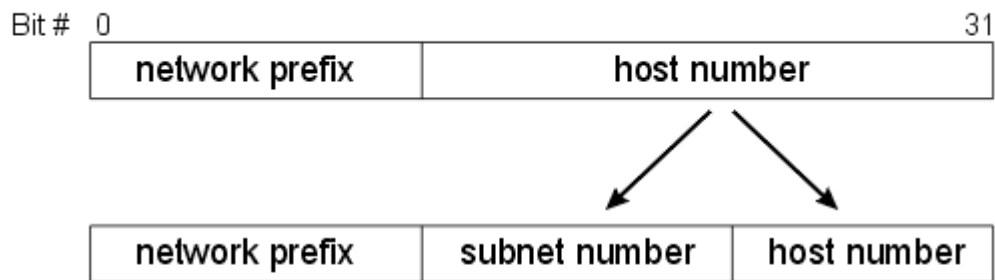
Now that you know a bit more about the best and most popular web search engines in the world, is it time for you time to capitalize on these online opportunities? Among them Google, Bing and Yahoo are dominating the search engine mark and are used daily by most people in the world.

6. A subnet is a logical partition of an IP network into multiple, smaller network segments. It is typically used to subdivide large networks into smaller, more efficient subnetworks. The internet is composed of many networks that are run by many organizations.

Subnet Addressing:

In 1985 a standard procedure to support the subnetting, or division, of a single Class A, B, or C network number into smaller pieces. Subnetting was introduced to overcome some of the problems that parts of the Internet were beginning to experience with the classful two-level addressing hierarchy:

- Internet routing tables were beginning to grow.
- Local administrators had to request another network number from the Internet before a new network could be installed at their site.



3-level Internet Address Structure

Both of these problems were attacked by adding another level of hierarchy to the IP addressing structure. Instead of the classful two-level hierarchy, subnetting supports a three-level hierarchy. The basic idea of subnetting is to divide the standard classful host-number field into two parts - the subnet-number and the hostnumber on that subnet. Subnetting attacked the expanding routing table problem by ensuring that the subnet structure of a network is never visible outside of the organization's private network. The route from the Internet to any subnet of a given IP address is the same, no matter which subnet the destination host is on. This is because all subnets of a given network number use the same network-prefix but different subnet numbers. The routers within the private organization need to differentiate between the individual subnets, but as far as the Internet routers are concerned, all of the subnets in the organization are collected into a single routing table entry. This allows the local administrator to introduce arbitrary complexity into the private network without affecting the size of the Internet's routing tables. Subnetting overcame the registered number issue by assigning each organization one (or at most a few) network number(s) from the IPv4 address space. The organization was then free to assign a distinct subnetwork number for each of its internal networks. This allows the organization to deploy additional subnets without needing to obtain a new network number from the Internet. The

extended-network-prefix has traditionally been identified by the subnet mask. For example, if you have a Class B address of 130.5.0.0 and you want to use the entire third octet to represent the subnet-number, you need to specify a subnet mask of 255.255.255.0. The bits in the subnet mask and the Internet address have a one-to-one correspondence. The bits of the subnet mask are set to 1 if the system examining the address should treat the corresponding bit in the IP address as part of the extended-network-prefix. The bits in the mask are set to 0 if the system should treat the bit as part of the host-number.

7.

a. IMAP allows you to access your email wherever you are, from any device. When you read an email message using IMAP, you aren't actually downloading or storing it on your computer; instead, you're reading it from the email service. As a result, you can check your email from different devices, anywhere in the world: your phone, a computer, a friend's computer. IMAP only downloads a message when you click on it, and attachments aren't automatically downloaded. This way you're able to check your messages a lot more quickly than POP. The easiest way to understand how IMAP works is by thinking of it as an intermediary between your email client and your email server. Email servers are always used when sending and receiving email messages. With IMAP, though, they remain on the server unless you explicitly delete them from it. When you sign into an email client like Microsoft Outlook, it contacts the email server using IMAP. The headers of all of your email messages are then displayed.

b. The World Wide Web (WWW) is a network of online content that is formatted in HTML and accessed via HTTP. The term refers to all the interlinked HTML pages that can be accessed over the Internet. The Web, as it's commonly known, is often confused with the internet. Although the two are intricately connected, they are different things. The internet is, as its name implies, a network -- a vast, global network that incorporates a multitude of lesser networks. As such, the internet consists of supporting infrastructure and other technologies. In contrast, the Web is a communications model that, through HTTP, enables the exchange of information over the internet. Tim-Berners-Lee is the inventor of the Web and the director of the W3C, the organization that oversees its development. Berners-Lee developed hypertext, the method of instant cross-referencing that supports communications on the Web, making it easy to link content on one web page to content located elsewhere. The introduction of hypertext revolutionized the way people used the internet.

c.

Post Office Protocol version 3 (POP3) is a standard mail protocol used to receive emails from a remote server to a local email client. POP3 allows you to download email messages on your local computer and read them even when you are offline. The Post Office Protocol (POP3) is an Internet standard protocol used by local email software clients to retrieve emails from a remote mail server over a TCP/IP connection. Since the first version was created in 1984, the Post Office Protocol (currently at Version 3) has since become one of the most popular protocols and is used by virtually every email client to date. Its popularity lies in the protocol's simplicity to configure, operate and maintain.

Email servers hosted by Internet service providers also use POP3 to receive and hold emails intended for their subscribers. Periodically, these subscribers will use email client software to check their mailbox on the remote server and download any emails addressed to them. Once the email client has downloaded the emails, they are usually deleted from the server, although some email clients allow users to specify that mails be copied or saved on the server

for a period of time. Email clients generally use the well-known TCP port 110 to connect to a POP3 server. If encrypted communication is supported on the POP3 server.

d.

A web browser takes you anywhere on the internet, letting you see text, images and video from anywhere in the world. The web is a vast and powerful tool. Over the course of a few decades the internet has changed the way we work, the way we play and the way we interact with one another. Depending on how it's used, it bridges nations, drives commerce, nurtures relationships, drives the innovation engine of the future and is responsible for more memes than we know what to do with. It's important that everyone has access to the web, but it's also vital that we all understand the tools we use to access it. We use web browsers like Mozilla Firefox, Google Chrome, Microsoft Edge and Apple Safari every day, but do we understand what they are and how they work? In a short period of time we've gone from being amazed by the ability to send an email to someone around the world, to a change in how we think of information. It's not a question of how much you know anymore, but simply a question of what browser or app can get you to that information fastest. A web browser takes you anywhere on the internet. It retrieves information from other parts of the web and displays it on your desktop or mobile device.