KARPAGAM ACADEMY OF HIGHER EDUCATION

(Deemed to be University)
(Established Under Section 3 of UGC Act 1956)
Eachanari (po), Coimbatore-21

Semester – II

18ITU203 COMPUTER NETWORKS AND INTERNET TECHNOLOGIES **4H – 4C**

Instruction Hours / week:L: 4 T: 0 P: 0 **Marks:**Internal :**40** External : **60** Total: **100**
End Semester Exam : 3 Hours

Course Objectives

- To study the basics of Computer Networks.
- To study and compare various Network architectures and fundamental protocols.
- To learn about networking protocol and OSI model.
- To learn various transmission media.
- To understand the topologies of networks, layered architecture (OSI and TCP/IP) and protocol suites.
- To understand the principles of creating an effective web page.
- To develop skills in analyzing the usability of a website.
- To learn the language of HTML, DHTML, XML and PHP.

Course Outcomes(COs)

1. Independently understand basic computer network technology.
2. Understand and explain Data Communications System and its components.
3. Identify the different types of network topologies and protocols.
4. Enumerate the layers of the OSI model and TCP/IP.
5. Employ fundamental computer theory to basic programming techniques.
6. Gain the skills and project-based experience needed for entry into web design and development careers.
7. Develop awareness and appreciation of the many ways that people access the web, and will be able to create standards-based websites that can be accessed by the full spectrum of web access technologies
8. Select and apply markup languages for processing, identifying, and presenting of information in web pages.
9. Create and manipulate web media objects using editing software.

UNITI - COMPUTER NETWORKS

Introduction to computer network, data communication, components of data communication, data transmission mode, data communication measurement, LAN, MAN, WAN, wireless LAN, internet, intranet, extranet.**Network Models**: Client/ server network and Peer-to-peer network, OSI, TCP/IP, 8L layers and functionalities.

UNITII - TRANSMISSION MEDIA AND LAN TOPOLOGIES

Introduction, Guided Media: Twisted pair, Coaxial cable, Optical fiber. Unguided media: Microwave, Radio frequency propagation, Satellite.**LAN Topologies**: Ring, bus, star, mesh and tree topologies. Network Devices: NIC, repeaters, hub, bridge, switch, gateway and router.

UNIT III - INTERNET TERMS AND APPLICATIONS

Internet Terms: Web page, Home page, website, internet browsers, URL, Hypertext, ISP, Web server, download and upload, online and offline. **Internet Applications:** www, telnet, ftp, e-mail, social networks, search engines, Video Conferencing, e-Commerce, m-Commerce, VOIP, blogs.

UNIT IV - INTRODUCTION TO WEB DESIGN

Introduction to hypertext markup language (html) Document type definition, creating web pages, lists, hyperlinks, tables, web forms, inserting images, frames, hosting options and domain name registration. **Customized Features**: Cascading style sheet (css) for text formatting and other manipulations.

UNIT V - JAVASCRIPT FUNDAMENTALS

Data types and variables, functions, methods and events, controlling program flow, JavaScript object model, built-in objects and operators.

SUGGESTED READINGS

S1. Larry L.Peterson& Bruce S.Davie (2011). Computer Networks A System Approach, Morgan Kaufmann Publishers.

S2. Andrew S. Tanenbaum, David J. Wetherall Computer Networks (5th Edition),PHI, 2010

S3. B. A. Forouzan, Data Communication and Networking , TMH,2003.

S4. D.R. Brooks, An Introduction to HTML and Javascript for Scientists and Engineers, Springer W. Willard,2009

S5. HTML A Beginner's Guide, Tata McGraw-Hill Education, 2009.

S6. J. A. Ramalho, Learn Advanced HTML 4.0 wit

WEBSITES

W1. https://developer.mozilla.org/en-US/docs/Web

W2. https://www.w3schools.com

W3. https://www.tutorialspoint.com/~/computer_network_topologies.htm

W4. https://www.geeksforgeeks.org/network-devices-

W5. http://en.wikipedia.org/

W6. https://css-tricks.com

ESE Pattern	
Part – A (Online)	20 * 1 = 20
Part – B	5 * 2 = 10
Part – C (Either or)	5 * 6 = 30
Total	60 marks

Faculty **HOD**

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DEPARTMENT OF CS, CA & IT

LECTURE PLAN

SUBJECT NAME: Computer Networks and Internet Technologies

SUBJECT CODE: 18ITU203 **SEMESTER: II**

BATCH: 2018-2021 **CLASS: I B.Sc.IT**

STAFF: Dr.D.SHANMUGA PRIYAA

S.No	Lecture Duration (Hr)	Topics	Support Materials
		UNIT -I	
1.	1	Introduction to computer network, data communication, components of data communication	S3:3-5
2.	1	Data transmission mode, data communication measurement,	S3:6-8
3.	1	LAN, MAN, WAN, wireless LAN,	S3:13-16
4.	1	internet, intranet, extranet	W2
5.	1	**Network Models**: Client/ server network and Peer-to-peer network,	S3:27-31
6.	1	OSI Layers and functionalities	S3:33-41
7.	1	TCP/IP Layers and functionalities	S3:42-44
8.	1	Recapitulation and Discussion of important questions	
	1	**Total No. of Periods allotted for Unit – I**	**8**
		UNIT-II	
1.	1	Introduction, Guided Media: Twisted pair, Coaxial cable	S3:192:198
2.	1	Optical fiber. Unguided media- Microwave	S3:198-205
3.	1	Radio frequency propagation, Satellite	S3:205-208
4.	1	**LAN Topologies**: Ring, bus, star	S3:8-13,W3
5.	1	Mesh and tree topologies	W3
6.	1	Network Devices: NIC, repeaters, hub	W4

7.	1	Bridge, switch, gateway and router	W4
8.	1	Recapitulation and Discussion of important questions	
		Total No. of Hours allotted for Unit – II	**8**
		UNIT-III	
1.	1	Internet Terms: Web page, Home page, ISP,	W5
2.	1	Web server, download and upload, online and offline.	W5
3.	1	**Internet Applications:** www, telnet, ftp,	W5
4.	1	e-mail, social networks, search engines,	W5
5.	1	Video Conferencing	W5
6.	1	e-Commerce, m-Commerce,	W5
7.	1	VOIP, blogs.	W5
8.	1	Recapitulation and Discussion of important questions	
		Total No. of Hours allotted for Unit – III	**8**
		UNIT-IV	
1.	1	Introduction to hypertext markup language (html)	S5:21-27
2.	1	Document type definition, creating web pages,	S5:27-32
3.	1	Lists, hyperlinks, tables	S5:171-177 S5:91-99 S5:197-226
4.	1	Web forms, inserting images, frames	S5:264-281 S5:120-127 S5:240-250
5.	1	Hosting options and domain name registration.	S5:415-420
6.	1	**Customized Features**: Cascading style sheet (css) for text	S5:36-43
7.	1	formatting and other manipulations	S5:55-89
8.	1	Recapitulation and Discussion of important questions	
		Total No. of Hours allotted for Unit – IV	**8**
		UNIT-V	
1.	1	Data types and variables, functions	S4:73-75 S4:128-139
2.	1	methods and events	S4:140-143
3.	1	controlling program flow	S4:90-99

4.	1	JavaScript object model	W2
5.	1	Built-in objects and operators.	S4:78-90
6.	1	Recapitulation and Discussion of important questions	
7.	1	Discussion of previous ESE Question papers	
8.	1	Discussion of previous ESE Question papers	
		Total No. of Hours allotted for Unit – V	**8**

Total No. of Hours: 40

Suggested Readings

S1. Larry L.Peterson& Bruce S.Davie (2011). Computer Networks A System Approach, Morgan Kaufmann Publishers.
S2. Andrew S. Tanenbaum, David J. Wetherall Computer Networks (5th Edition),PHI, 2010
S3. B. A. Forouzan, Data Communication and Networking , TMH,2003.
S4. D.R. Brooks, An Introduction to HTML and Javascript for Scientists and Engineers, Springer W. Willard,2009
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S6. J. A. Ramalho, Learn Advanced HTML 4.0 wit

Websites

W1. https://developer.mozilla.org/en-US/docs/Web
W2. https://www.w3schools.com
W3. https://www.tutorialspoint.com/~/computer_network_topologies.htm
W4. https://www.geeksforgeeks.org/network-devices-
W5. http://en.wikipedia.org/
W6. https://css-tricks.com

UNIT-I

Computer Networks: Introduction to computer network, data communication, components of data communication, data transmission mode, data communication measurement, LAN, MAN, WAN, wireless LAN, internet, intranet, extranet. Network Models: Client/ server network and Peer-to-peer network, OSI, TCP/IP, layers and functionalities.

Data: Data refers to information presented in whatever from is agreed upon by the parties creating and using the data.

Data Communication : Networks exist so that data may be sent from one place to another. It is the exchange of data between two devices via some form of transmission medium such as a wire cable. Data communication between remote parties can be achieved through a process called networking, involving the connection of computers, media and networking devices.

Networks: A network is a set of devices (often referred to as nodes) connected by communication links. A node can be a computer, printer, or any other device capable of sending and/or receiving data generated by other nodes on the network.

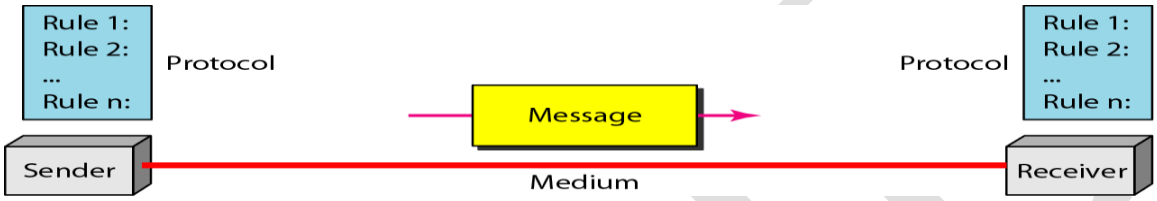
- For a communication to occur the communicating system must be made up of software and hardware
- Three fundamental characteristics for data communication system are
    1. Delivery- deliver data to correct destination
    2. Accuracy-must deliver the data accurately
    3. Timeliness- the system must deliver the data in a timely manner (eg: audio, video – real time transmission.
    4. Jitter- Jitter refers to the variation in the packet arrival time. It is the uneven delay in the delivery of audio or video packets. For example, let us assume that video packets are sent every 3D Ms. If some of the packets arrive with 3D-ms delay and others with 4D-ms delay, an uneven quality in the video is the result.

Components of data communication:

It has 5 components

1. Message: It is the information to be communicated. It consists of text, numbers, pictures, sound, or any combination of these.

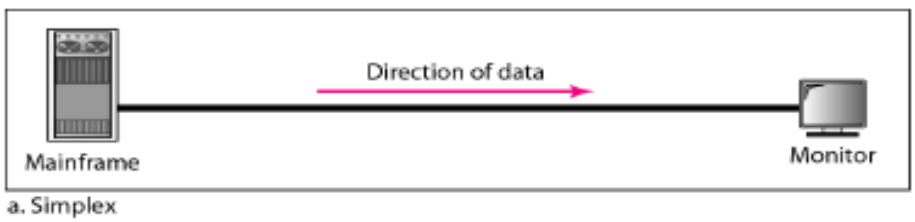
2. Sender: it is a device that sends the data message. It can be a computer, workstation, telephone handset, video camera etc.
3. Receiver: it is a device which receives the message. It can be a computer, workstation etc.
4. Medium: The transmission medium is the physical path by which a message travels from sender to receiver. It can be twisted pair wire, coaxial cable, fiber optic cable, or radio waves.
5. Protocols: It is a set of rules that governs data communication. It represents an agreement between the communicating devices



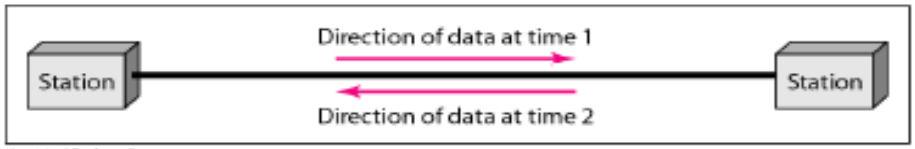
Data transmission mode: Direction of data flow

Transmission mode means transferring of data between two devices. It is also known as communication mode. Buses and networks are designed to allow communication to occur between individual devices that are interconnected. There are three types of transmission mode:-

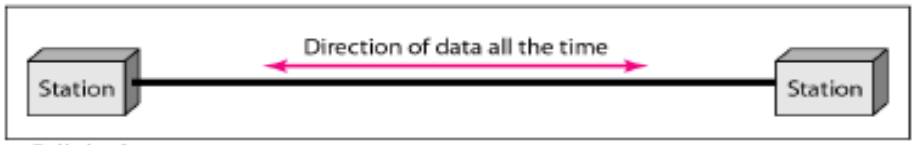
- Simplex Mode
- Half-Duplex Mode
- Full-Duplex Mode



a. Simplex



b. Half-duplex



c. Full-duplex

Simplex Mode

In Simplex mode, the communication is unidirectional, as on a one-way street. Only one of the two devices on a link can transmit, the other can only receive. The simplex mode can use the entire capacity of the channel to send data in one direction. Example: Keyboard and traditional monitors. The keyboard can only introduce input, the monitor can only give the output.

Half-Duplex Mode

In half-duplex mode, each station can both transmit and receive, but not at the same time. When one device is sending, the other can only receive, and vice versa. The half-duplex mode is used in cases where there is no need for communication in both direction at the same time. The entire capacity of the channel can be utilized for each direction. Example: Walkie- talkie in which message is sent one at a time and messages are sent in both the directions.

Full-Duplex Mode

In full-duplex mode, both stations can transmit and receive simultaneously. In full duplex mode, signals going in one direction share the capacity of the link with signals going in other direction, this sharing can occur in two ways:

- Either the link must contain two physically separate transmission paths, one for sending and other for receiving.
- Or the capacity is divided between signals traveling in both directions.

Full-duplex mode is used when communication in both directions is required all the time. The capacity of the channel however must be divided between the two directions. Example: Telephone Network in which there is communication between two persons by a telephone line, through which both can talk and listen at the same time.

Data communication measurements:

Performance is the defined as the rate of transferring error free data. It is measured by the Response Time. Response Time is the elasped time between the end of an inquiry and the

beginning of a response. Request a file transfer and start the file transfer. Factors that affect Response Time are:

- Number of Users: More users on a network - slower the network will run
- Transmission Speed: speed that data will be transmitted measured in bits per second (bps)
- Media Type: Type of physical connection used to connect nodes together
- Hardware Type: Slow computers such as XT or fast such as Pentiums
- Software Program: How well is the network operating system (NOS) written

Consistency

Consistency is the predictability of response time and accuracy of data. Users prefer to have consistent response times, they develop a feel for normal operating conditions. For example: if the "normal" response time is 3 sec. for printing to a Network Printer and a response time of over 30 sec happens, we know that there is a problem in the system! Accuracy of Data determines if the network is reliable! If a system loses data, then the users will not have confidence in the information and will often not use the system.

Reliability

Reliability is the measure of how often a network is useable. MTBF (Mean Time Between Failures) is a measure of the average time a component is expected to operate between failures. Normally provided by the manufacturer. A network failure can be: hardware, data carrying medium and Network Operating System.

Recovery

Recovery is the Network's ability to return to a prescribed level of operation after a network failure. This level is where the amount of lost data is nonexistent or at a minimum. Recovery is based on having Back-up Files.

Security

Security is the protection of Hardware, Software and Data from unauthorized access. Restricted physical access to computers, password protection, limiting user privileges and data encryption are common security methods. Anti-Virus monitoring programs to defend against computer viruses are a security measure.

Types of Communication Networks

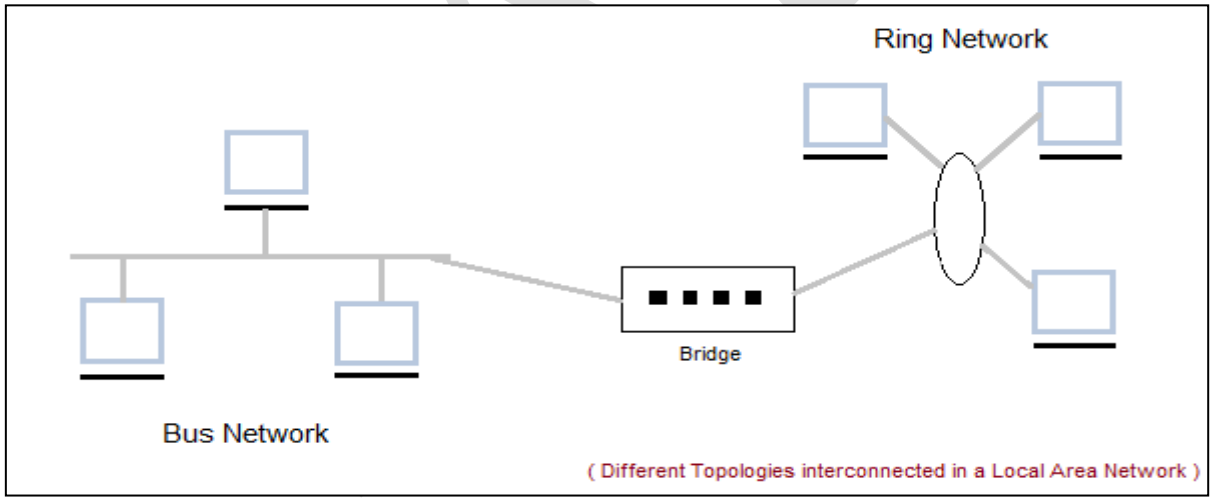
Communication Networks can be of following types:

1. Local Area Network (LAN)
2. Metropolitan Area Network (MAN)
3. Wide Area Network (WAN)
4. Wireless
5. Inter Network (Internet)
6. Intranet
7. Extranet

Local Area Network (LAN)

It is also called LAN and designed for small physical areas such as an office, group of buildings or a factory. LANs are used widely as it is easy to design and to troubleshoot. Personal computers and workstations are connected to each other through LANs. We can use different types of topologies through LAN, these are Star, Ring, Bus, Tree etc.

LAN can be a simple network like connecting two computers, to share files and network among each other while it can also be as complex as interconnecting an entire building. LAN networks are also widely used to share resources like printers, shared hard-drive etc.



(Different Topologies interconnected in a Local Area Network)

Characteristics of LAN

- LAN's are private networks, not subject to tariffs or other regulatory controls.
- LAN's operate at relatively high speed when compared to the typical WAN.
- There are different types of Media Access Control methods in a LAN, the prominent ones are Ethernet, Token ring.

- It connects computers in a single building, block or campus, i.e. they work in a restricted geographical area.

Applications of LAN

- One of the computer in a network can become a server serving all the remaining computers called clients. Software can be stored on the server and it can be used by the remaining clients.
- Connecting Locally all the workstations in a building to let them communicate with each other locally without any internet access.
- Sharing common resources like printers etc are some common applications of LAN.

Advantages of LAN

- **Resource Sharing:** Computer resources like printers, modems, DVD-ROM drives and hard disks can be shared with the help of local area networks. This reduces cost and hardware purchases.
- **Software Applications Sharing:** It is cheaper to use same software over network instead of purchasing separate licensed software for each client a network.
- **Easy and Cheap Communication:** Data and messages can easily be transferred over networked computers.
- **Centralized Data:** The data of all network users can be saved on hard disk of the server computer. This will help users to use any workstation in a network to access their data. Because data is not stored on workstations locally.
- **Data Security:** Since, data is stored on server computer centrally, it will be easy to manage data at only one place and the data will be more secure too.
- **Internet Sharing:** Local Area Network provides the facility to share a single internet connection among all the LAN users. In Net Cafes, single internet connection sharing system keeps the internet expenses cheaper.

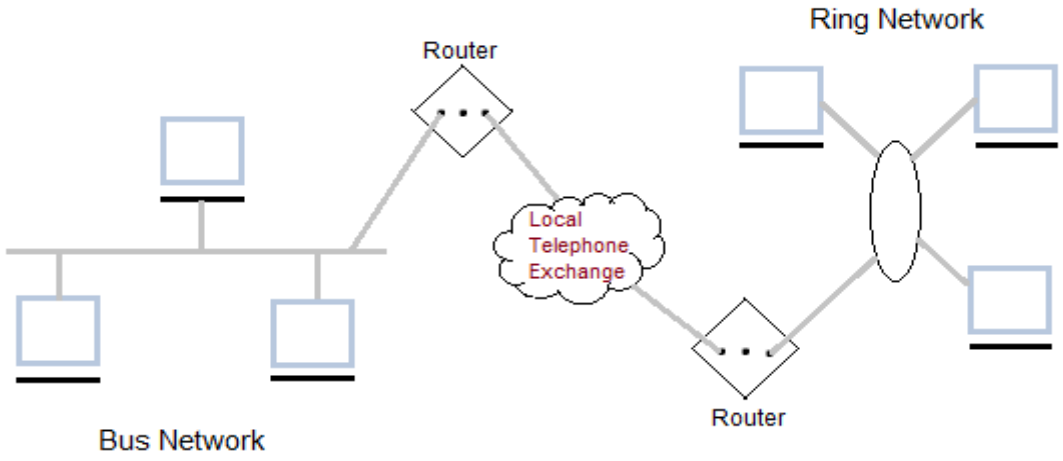
Disadvantages of LAN

- **High Setup Cost:** Although the LAN will save cost over time due to shared computer resources, but the initial setup costs of installing Local Area Networks is high.
- **Privacy Violations:** The LAN administrator has the rights to check personal data files of each and every LAN user. Moreover he can check the internet history and computer use history of the LAN user.

- **Data Security Threat:** Unauthorised users can access important data of an organization if centralized data repository is not secured properly by the LAN administrator.
- **LAN Maintenance Job:** Local Area Network requires a LAN Administrator because, there are problems of software installations or hardware failures or cable disturbances in Local Area Network. A LAN Administrator is needed at this full time job.
- **Covers Limited Area:** Local Area Network covers a small area like one office, one building or a group of nearby buildings.

Metropolitan Area Network (MAN)

It was developed in 1980s.It is basically a bigger version of LAN. It is also called MAN and uses the similar technology as LAN. It is designed to extend over the entire city. It can be means to connecting a number of LANs into a larger network or it can be a single cable. It is mainly hold and operated by single private company or a public company.



Characteristics of MAN

- It generally covers towns and cities (50 km)
- Communication medium used for MAN are optical fibers, cables etc.
- Data rates adequate for distributed computing applications.

Advantages of MAN

- Extremely efficient and provide fast communication via high-speed carriers, such as fibre optic cables.
- It provides a good back bone for large network and provides greater access to WANs.

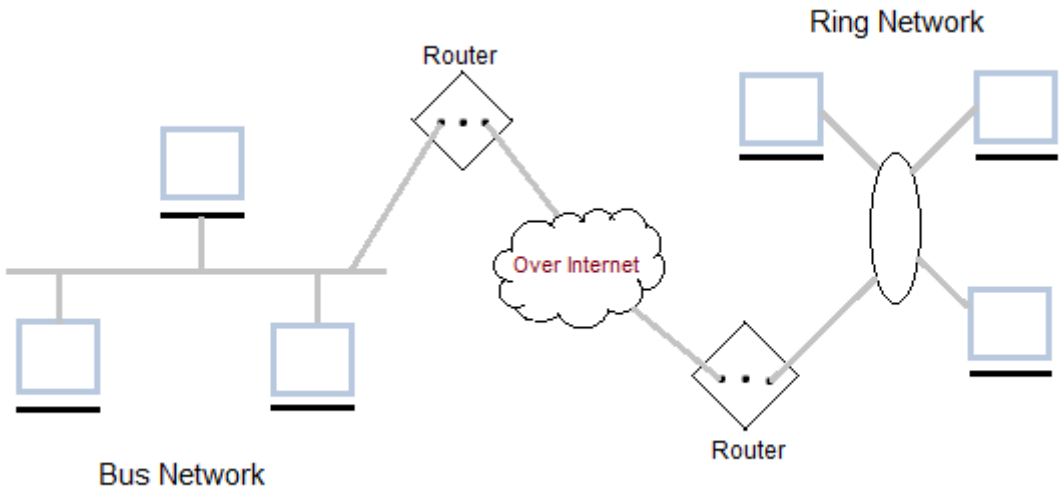
- The dual bus used in MAN helps the transmission of data in both directions simultaneously.
- A MAN usually encompasses several blocks of a city or an entire city.

Disadvantages of MAN

- More cable required for a MAN connection from one place to another.
- It is difficult to make the system secure from hackers and industrial espionage(spying) graphical regions.

Wide Area Network (WAN)

It is also called WAN. WAN can be private or it can be public leased network. It is used for the network that covers large distance such as cover states of a country. It is not easy to design and maintain. Communication medium used by WAN are PSTN or Satellite links. WAN operates on low data rates.



Characteristics of WAN

- It generally covers large distances(states, countries, continents).
- Communication medium used are satellite, public telephone networks which are connected by routers.

Advantages of WAN

- Covers a large geographical area so long distance business can connect on the one network.
- Shares software and resources with connecting workstations.
- Messages can be sent very quickly to anyone else on the network. These messages can have picture, sounds or data included with them(called attachments).
- Expensive things(such as printers or phone lines to the internet) can be shared by all the computers on the network without having to buy a different peripheral for each computer.
- Everyone on the network can use the same data. This avoids problems where some users may have older information than others.

Disadvantages of WAN

- Need a good firewall to restrict outsiders from entering and disrupting the network.
- Setting up a network can be an expensive, slow and complicated. The bigger the network the more expensive it is.
- Once set up, maintaining a network is a full-time job which requires network supervisors and technicians to be employed.
- Security is a real issue when many different people have the ability to use information from other computers. Protection against hackers and viruses adds more complexity and expense.

Wireless LANs

WLAN Stands for "Wireless Local Area Network." A WLAN, or wireless LAN, is a network that allows devices to connect and communicate wirelessly. Unlike a traditional wired LAN, in which devices communicate over Ethernet cables, devices on a WLAN communicate via Wi-Fi.

While a WLAN may look different than a traditional LAN, it functions the same way. New devices are typically added and configured using DHCP. They can communicate with other devices on the network the same way they would on a wired network. The primary difference is how the data is transmitted. In a LAN, data is transmitted over physical cables in a series of Ethernet packets containing. In a WLAN, data is transmitted over the air using one of Wi-Fi 802.11 protocols.

As wireless devices have grown in popularity, so have WLANs. In fact, most routers sold are now wireless routers. A wireless router serves as a base station, providing wireless connections to any Wi-Fi-enabled devices within range of the router's wireless signal. This includes laptops, tablets, smartphones, and other wireless devices, such as smart appliances and smart home controllers. Wireless routers often connect to a cable modem or other Internet-connected device to provide Internet access to connected devices.

LANs and WLANs can be merged together using a bridge that connects the two networks. Many wireless routers also include Ethernet ports, providing connections for a limited number of wireless devices. In most cases, wireless routers act as a bridge, merging the Ethernet and Wi-Fi-connected devices into the same network. This allows wired and wireless devices to communicate with each other through a single router.

Advantages of WLANs

- The most obvious advantage of a WLAN is that devices can connect wirelessly, eliminating the need for cables. This allows homes and businesses to create local networks without wiring the building with Ethernet.
- It also provides a way for small devices, such as smartphones and tablets, to connect to the network.
- WLANs are not limited by the number of physical ports on the router and therefore can support dozens or even hundreds of devices. The range of a WLAN can easily be extended by adding one or more repeaters.
- Finally, a WLAN can be easily upgraded by replacing routers with new versions — a much easier and cheaper solution than upgrading old Ethernet cables.

Disadvantages of WLANs

- Wireless networks are naturally less secure than wired networks. Any wireless device can attempt to connect to a WLAN, so it is important to limit access to the network if security is a concern. This is typically done using wireless authentication such as WEP or WPA, which encrypts the communication.

- Additionally, wireless networks are more susceptible to interference from other signals or physical barriers, such as concrete walls. Since LANs offer the highest performance and security, they are still used for many corporate and government networks.

Inter Network

Inter Network or Internet is a combination of two or more networks. Inter network can be formed by joining two or more individual networks by means of various devices such as routers, gateways and bridges.

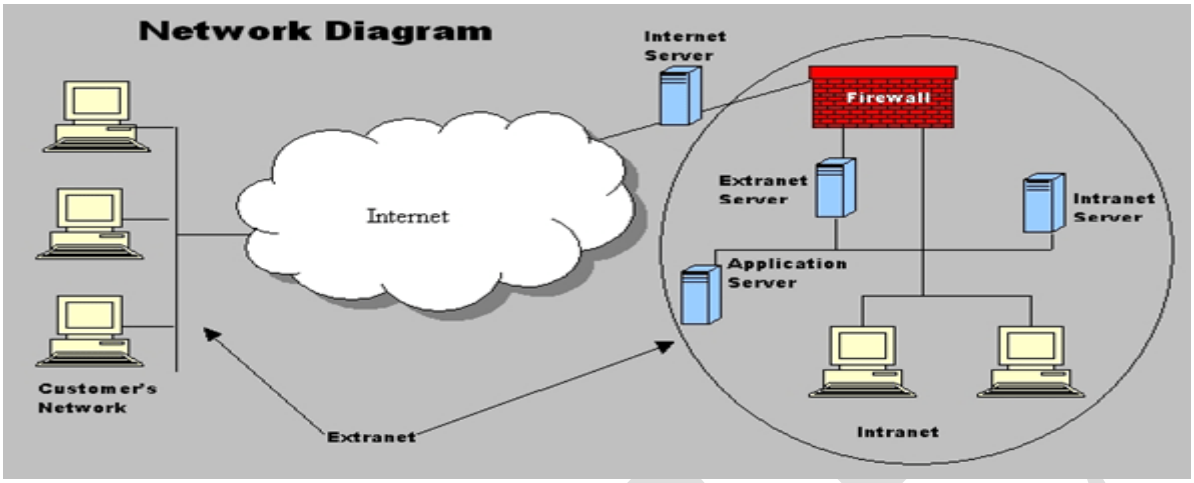
The Internet functions via several major hubs throughout the world, where they connect and are able to connect to other major hubs. Because servers are physically located throughout the world, this is why some websites are able to return information faster than others - a server in a nearby city does not have to send data as far as a server thousands of miles away.

Intranet

Intranet is a restricted version of the internet that typically does not allow access to anyone outside of its network. An intranet is typically a local only network, meaning only people who are directly wired to the intranet can access the information stored on its servers. Intranets may be used for organizations or networks that do not want their information to be able to be accessed by outside sources, and is especially important for organizations that require a high amount of secrecy - such as a server that holds military secrets or a database for the CIA. Intranets are basically mini versions of the internet that connect just a few servers, instead of the countless number of servers that the internet holds and connects with one another.

Extranet

Internet and an intranet are not always separate and clear cut, and anything that is a blend of the two is considered an extranet. An extranet is a private intranet (or local network) that is connected to the Internet, but only allows access to certain information or access by certain groups of people. The extranet is a blend of the secrecy and control allowed to an intranet, but also the convenience and sheer amount of information enjoyed by using the internet. Extranets, however, are not perfect, and almost any network connected to the internet can be accessed inappropriately given enough time, motivation, and resources by an interested party. If a hacker with the right skill set decides to access an extranet, the question is more a matter of when they will be able to get past security measures and access it, rather than if they will be able to.



Internet	Intranet	Extranet
It is a **Global system** of interconnected computer network.	It is a **Private network** specific to an organisation.	It is a **Private network** that uses public network to share information with suppliers and vendors.
Not regulated by any authority.	It is regulated by an organization.	It is regulated by multiple organization.
Thus content in the network is **accessible to everyone** connected.	Thus content in the network is accessible **only to members** of organization.	The content in the network is accessible to members of organization & **external members** with access to network.
It is largest in terms of number of connected devices.	It is small network with minimal number of connected devices.	The number of devices connected is comparable with Intranet.
It is owned by no one.	It is owned by single organization.	It is owned by single/multiple organization.
It is means of **sharing information** throughout the world.	It is means of **sharing sensitive information** throughout organization.	It is means of sharing information **between members and external** members.
Security is dependent of the user of device connected to network.	Security is enforced via a firewall.	Security is enforced via a firewall that separates internet & extranet.

Example: What we are normally using is internet.	**Example:** TCS using internal network for its business operations.	**Example:** HP and Intel using network for business related operations.
Users can access Internet anonymously.	Users should have valid username/password to access Intranet.	Users should have valid username/password to access Extranet.
Internet is **unregulated and uncensored**.	But Intranet is regulated by the **organization policies**.	Extranet is also **regulated by contractual** agreements between organizations.

NETWORK MODELS

CLIENT SERVER NETWORK

This is a network model that offers centralized access to services and devices. One computer plays the role of a server.

What is a Client? A computer which is seeking any resource from another computer is a Client Computer. You can think a client as a computer in your network, where a network user is performing some network activity. For Example: Downloading a file from a File Server, Browsing Intranet/Internet etc. The network user normally uses a client computer to perform his day to day work.

What is a Server? If a computer has a resource which is served to another computer, it is a Server computer. The client establishes a connection to a Server and accesses the services installed on the Server. A Server is not meant for a network user to browse in internet or do spreadsheet work. A Server computer is installed with appropriate Operating System and related Software to serve the network clients with one or more services, continuously without a break.

In a Client-Server network, high-end servers, installed with the Network Operating System (Server Operating System) and the related software, serve the clients continuously on a network, by providing them with specific services upon request.

Disadvantages

- **Cost: –** More expensive in terms of hardware and network operating system.
- **Complexity: –** Experienced system administrators are required to manage the systems.
- **Dependence: –** When server goes down, operations will cease across the network.

Advantages

1. They are best suited for **10 or more users.**
2. **Security: –** All major server based systems provides sophisticated security.
3. **Administration: –** Servers are centralized making them easier to manage.
4. **Stability: –** Server based systems are designed to support a wide range of organization sizes. Additional servers are added to increase capacity.
5. Client server networks offer **centralized backup** where data can be stored in one server.
6. **Flexibility** – New technology can be easily integrated into the system.
7. **Accessibility** – Server can be accessed remotely and across multiple platforms.

Peer-to-Peer

In a peer-to-peer networking environment, each computer can act as both a server and a client. Therefore, each computer can process the requests of another computer or send requests to another computer.

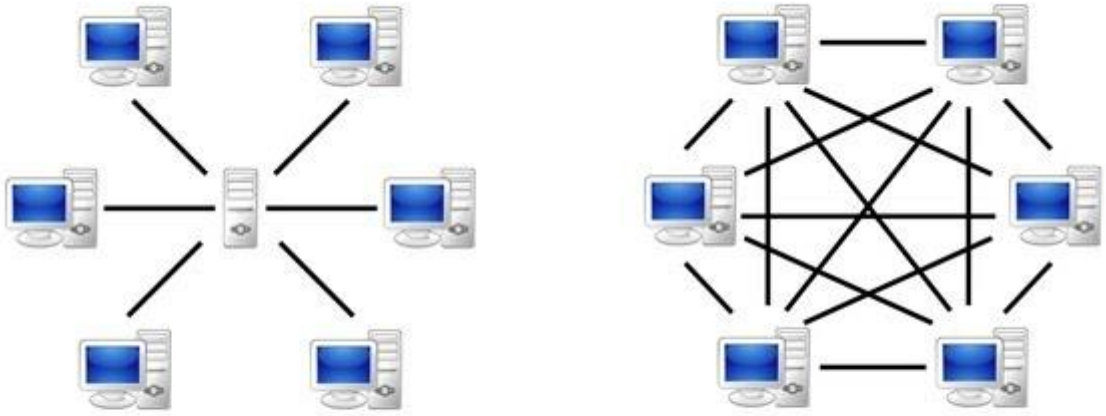
Advantages

- Peer-to-peer gains its largest advantage from cost, as it does not require a centralized server, a network operating system, or an administrator.
- Peer-to-peer networks are much easier to set-up than a client/server network and they do not rely upon a server for operation.

Disadvantages

- There are several disadvantages for peer-to-peer networks. They are slower than client/server networks and they are difficult to manage since each user becomes a network administrator.

- Peer-to-peer networks are not capable of supporting as many users as a client/server model nor do they have a central location for file storage. As a result, file management and backups can be difficult.
- Most peer-to-peer networks only allow specification of a separate password for each device, rather than defining access by account and assigning the account a single password.
- Furthermore, peer-to-peer networks typically only allow security on a specific drive or directory. Peer-to-peer networks are also incapable of supporting as many connections as a client/server configuration allows.

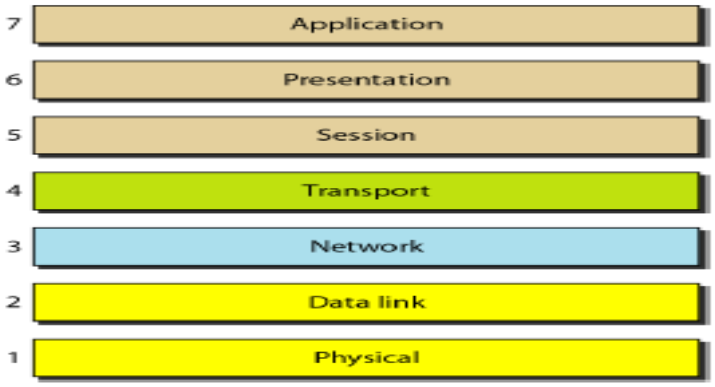


THE OSI MODEL

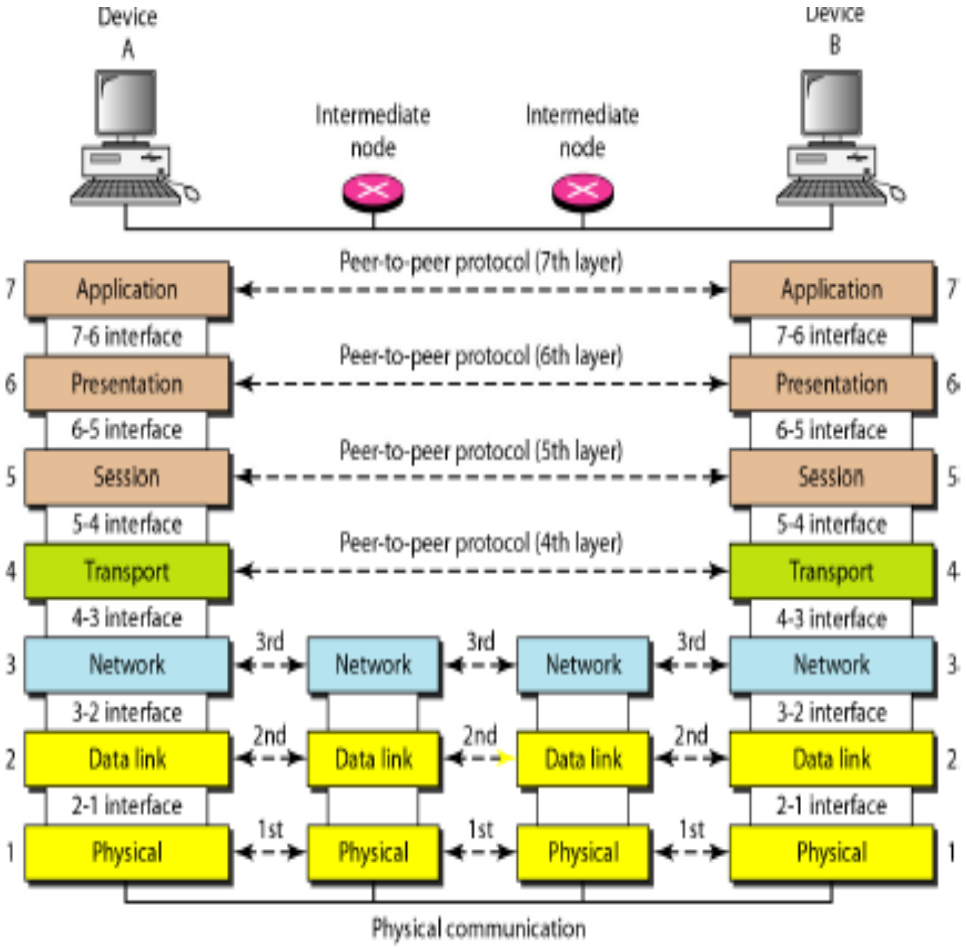
Established in 1947, the International Standards Organization (ISO) is a multinational body dedicated to world wide agreement on international standards.

An ISO standard that covers all aspects of network communications is the Open Systems Interconnection (OSI) model. It was first introduced in the late 1970s.

Seven layers of the OSI model



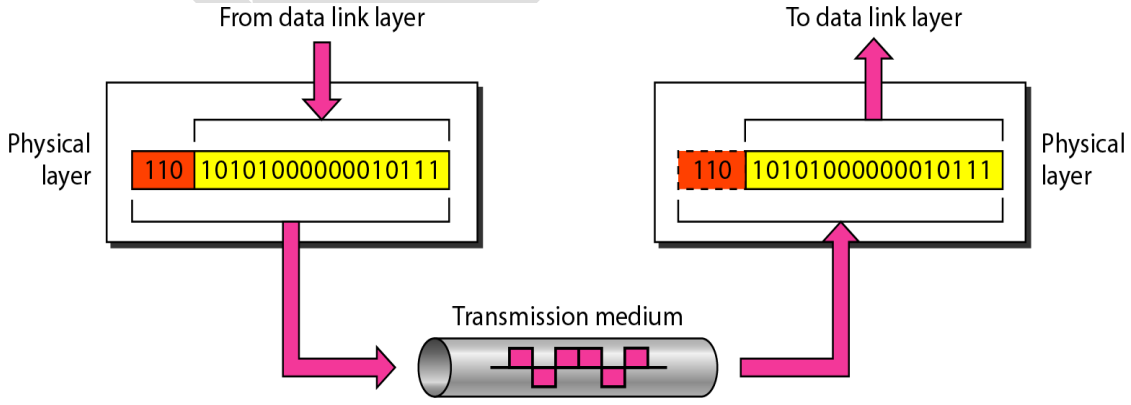
Peer-to-peer processes



THE OSI MODEL AND LAYERS

In this section we briefly describe the functions of each layer in the OSI model.

Physical Layer



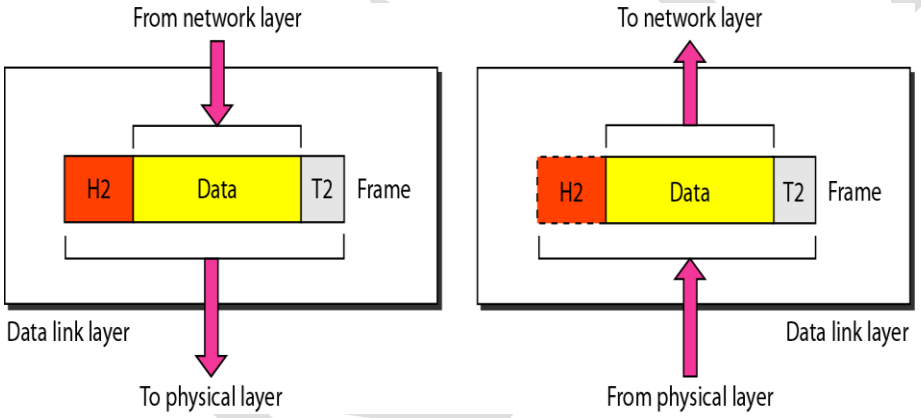
- The physical layer is responsible for movements of individual bits from one hop (node) to the next
- Mechanical and electrical specification, the procedures and functions

Duties:

- Physical characteristics of interfaces and media
- Representation of bits
- Data rate
- Synchronization of bits
- Line configuration
- Physical topology
- Transmission mode

Data link layer

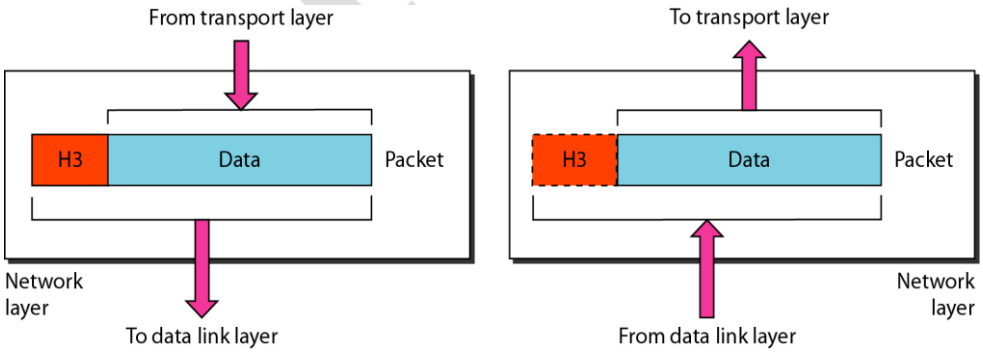
- The data link layer is responsible for moving frames from one hop (node) to the next
- Transform the physical layer to a reliable (error-free) link



Duties:

- Framing
- Physical addressing
- Flow control
- Error control
- Access control

Network layer

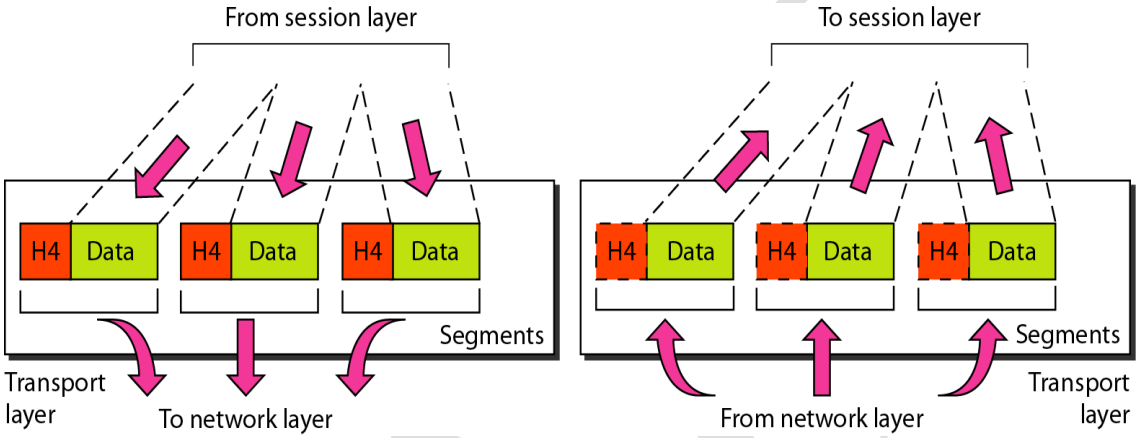


The network layer is responsible for the delivery of individual packets from the source host to the destination host.

Duties:

- Logical addressing
- Routing

Transport layer

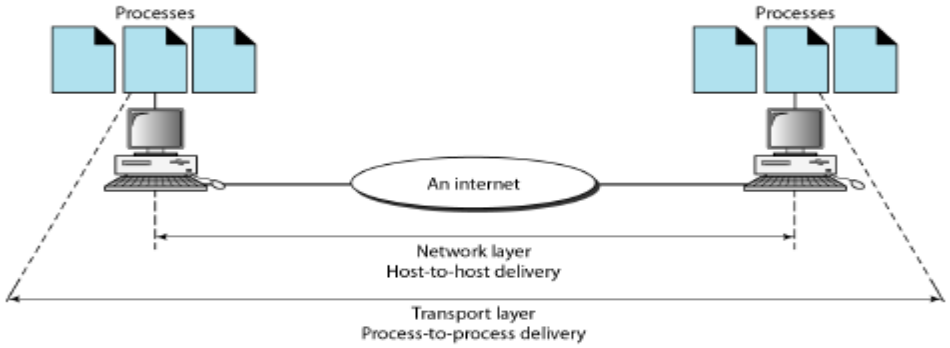


The transport layer is responsible for the delivery of a message from one process to another.

Duties:

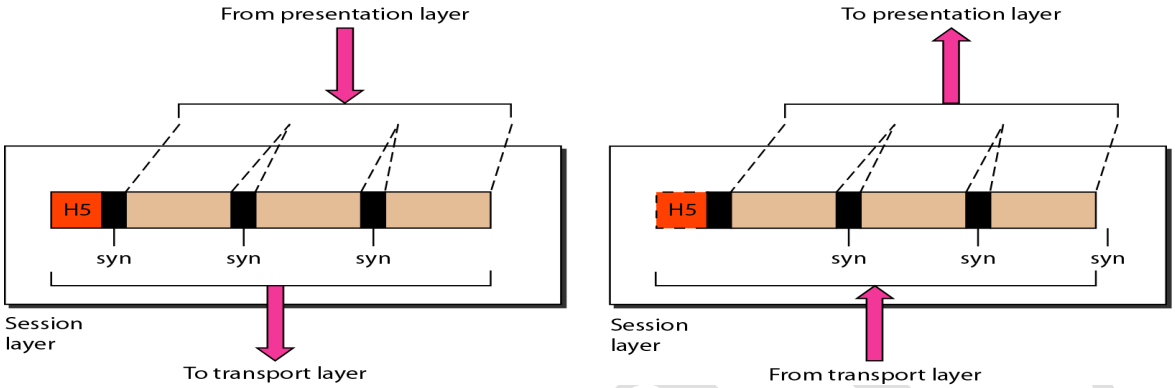
- Service-point (port) addressing
- Segmentation and reassembly
- Connection control
- Flow control
- Error control

Reliable process-to-process delivery



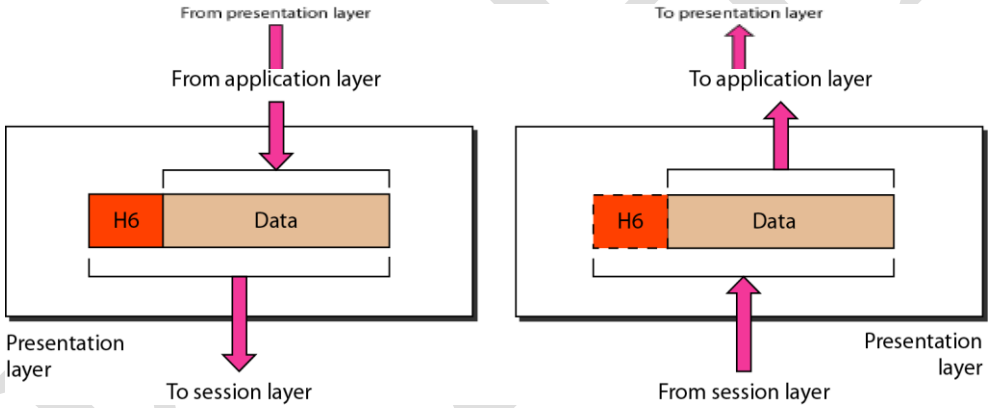
Session layer

The session layer is responsible for dialog control and synchronization.

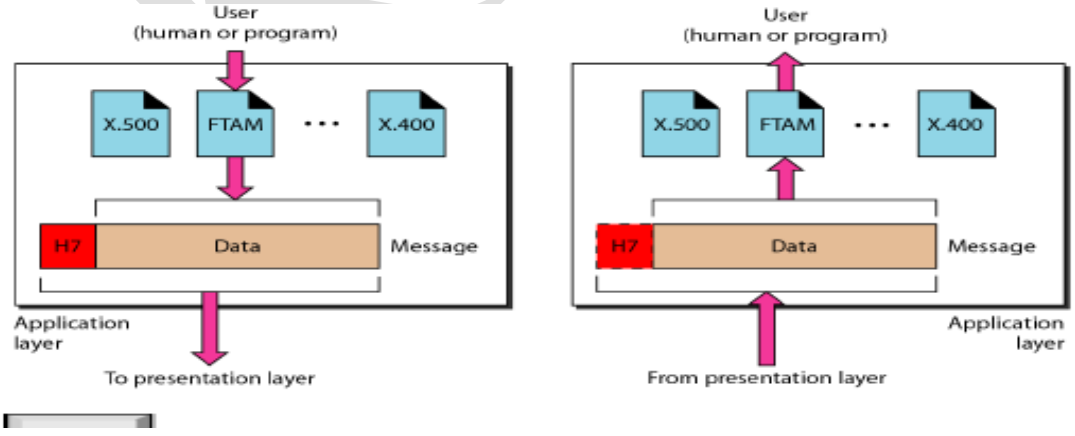


Presentation layer

The presentation layer is responsible for translation, compression, and encryption.



Application layer



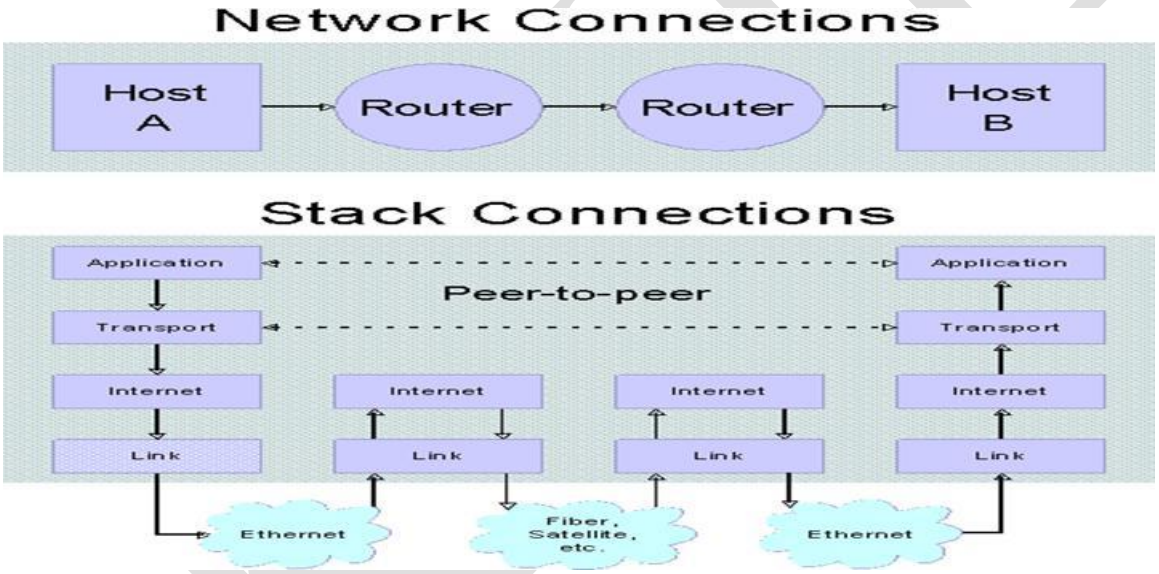
The application layer is responsible for providing services to the user.

Services:

- Network virtual terminal
- Mail services
- File transfer, access, and management
- Directory services

TCP/IP PROTOCOL SUITE

The layers in the TCP/IP protocol suite do not exactly match those in the OSI model. The original TCP//IP protocol suite was defined as having four layers:: host-to-network, internet, transport, and application. However, when TCP/IP is compared to OSI, we can say that the TCP/IP protocol suite is made of five layers: physical, data link, network, transport, and application.



TCP/IP Model Layers

Each layer of the TCP/IP has a particular function to perform and each layer is completely separate from the layer(s) next to it. The communication process that takes place, at its simplest between two computers, is that the data moves from layer 4 to 3 to 2 then to 1 and the information sent arrives at the second system and moves from 1 to 2 to 3 and then finally to layer 4.

Application Layer

The application layer is concerned with providing network services to applications. There are many application network processes and protocols that work at this layer, including HyperText

Transfer Protocol (HTTP), Simple Mail Transport Protocol (SMTP) and File Transfer Protocol (FTP).

At this layer sockets and port numbers are used to differentiate the path and sessions which applications operate. Most application layer protocols, especially on the server side, have specially allocated port numbers, e.g. HTTP = 80 and SMTP = 25, and FTP = 20 (Control), 21 (Data).

Transport Layer

This layer is concerned with the transmission of the data. The two main protocols that operate at this layer are Transmission Control Protocol (TCP) and User Datagram Protocol (UDP). TCP is regarded as being the reliable transmission protocol and it guarantees that the proper data transfer will take place. UDP is not as complex as TCP and as such is not designed to be reliable or guarantee data delivery. UDP is generally thought of as being a best effort data delivery, i.e. once the data is sent, UDP will not carry out any checks to see that it has safely arrived.

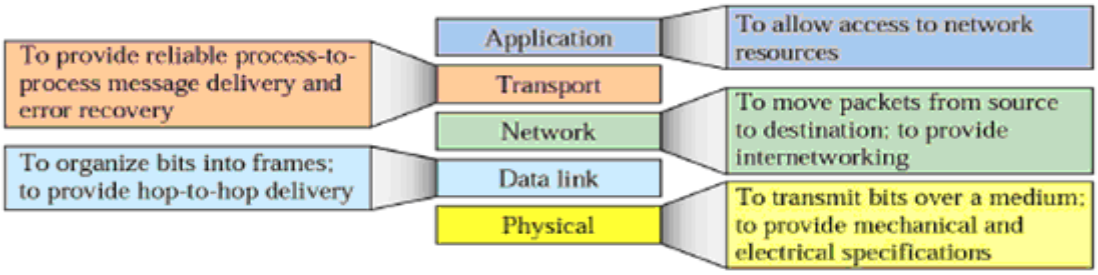
The Internet Layer

This is the layer that contains the packet construct that will be transmitted. This takes the form of the Internet Protocol (IP) which describes a packet that contains a source IP Address, destination IP Address and the actual data to be delivered.

Network Access Layer

This is the lowest level of the TCP/IP protocol stack and functions carried out here include encapsulation of IP packets into frames for transmission, mapping IP addresses to physical hardware addresses (MAC Addresses) and the use of protocols for the physical transmission of data.

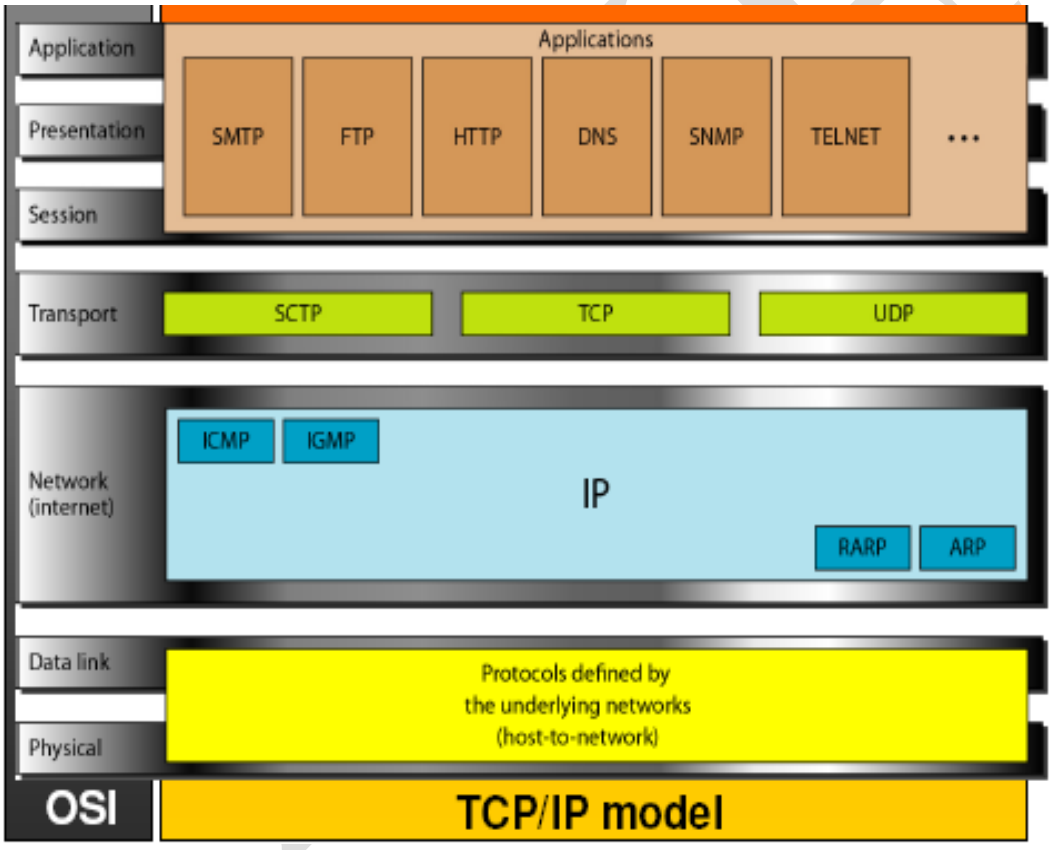
Note: TCP/IP is actually a suite of protocols sometimes referred to as the Internet Protocol Suite.



TCP/IP	OSI

TCP refers to Transmission Control Protocol.	OSI refers to Open Systems Interconnection.
TCP/IP has 4 layers.	OSI has 7 layers.
TCP/IP is more reliable	OSI is less reliable
TCP/IP does not have very strict boundaries.	OSI has strict boundaries
TCP/IP follow a horizontal approach.	OSI follows a vertical approach.
TCP/IP uses both session and presentation layer in the application layer itself.	OSI uses different session and presentation layers.
TCP/IP developed protocols then model.	OSI developed model then protocol.

TCP/IP and OSI model



CLASS: I B.Sc IT COURSE CODE: 18ITU203 BATCH-2018-2021
COURSE NAME: COMPUTER NETWORKS AND INTERNET TECHNOLOGIES
UNIT: I (Computer Networks)

POSSIBLE QUESTIONS

Part-B (2 marks)

1. Define networks.
2. What are the components of the data communication?
3. List the types of transmission modes
4. Differentiate simplex and full duplex transmission mode.
5. How to measure the response time in networks?
6. List out the factors that affect the performance of networks
7. What is LAN?
8. Compare and contrast MAN and WAN
9. What is Extranet
10. What is WLAN?
11. What are the advantages of client/server model over peer-to-peer network?
12. List out the layers in OSI model.
13. What are the layers in which error control is done in OSI model?
14. What is an IP address?
15. Give the layers of networks in TCP/IP model.

Part-C (8 Marks)

1. Define data, data communication and explain the components of data communication with a neat diagram.
2. Illustrate the various transmission modes with a neat diagram.
3. What are the performance measures of a network and how are they measured?
4. Write in detail about LAN, MAN and WAN
5. Compare and contrast Internet, Intranet and Extranet with a neat diagram
6. Describe the client/server network model and peer-to-peer network model with a neat sketch.
7. Elucidate the different layers and their functionalities of OSI model
8. Elucidate the different layers and their functionalities of TCP/IP model
9. Write short notes on (i) WLAN (ii) Internet

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DEPARTMENT OF CS,CA & IT

BATCH : 2018-2021

Unit -1 Part -A Multiple Choice Questions

Subject: Computer Network **Subject Code:18ITU203**

S.NO	Questions	OPT1	OPT2	OPT3	OPT4	ANSWER
1	MAN stands for _____	metropolitician area network	metropolitan area network	metropolitical area network	macro area network	metropolitan area network
2	In physical layer we can transfer data into _____	frame	packet	bit	sp du	bit
3	Hop to hop delivery is done by the _____	session layer	datalink layer	network layer	transport layer	datalink layer
4	The _____layer is responsible for process to process delivery.	physical	presentation	networks	transport	transport
5	The _____layer is responsible for dialog control and synchronization.	transport	session	application	presentation	session
6	Tcp/Ip is a _____protocol.	hyper text	transfer	internet	hierarchical	hierarchical
7	Ip is a_____protocol.	hop to hop	node to node	process to process	host to host	host to host
8	A set of devices connected by a _____links	data	networks	communication	application	communication
9	Bit length is _____	propagation speed/period	propagation speed * frequency	bit	propagation speed*bit duration	propagation speed*bit duration
10	OSI stands for_____	open systems interconnection	open system internetworking	open symantic interconnection	open system internet	open systems interconnection
11	Net work layer delivers data in the form of_____	frame	bits	data	packet	packet

12	Session layer provides_____ services.	one	two	three	four	two
13	UDP _____	user data protocol	user datagram protocol	user defined protocol	user dataframe protocol	user datagram protocol
14	FTP_____	file transmit protocol	file transmission protocol	file transfer protocol	flip transfer protocol	file transfer protocol
15	SMTP_____	single mail transfer protocol	simple mail transfer protocol	simple mail transmission protocol	single mail transmit protocol	simple mail transfer protocol
16	Jitter is a form of_____	frames	bits	packets	dp tu	packets
17	Full duplex also called as_____	simple duplex	single duplex	multiple duplex	duplex	duplex
18	_____can be measured in transmit time and response time.	performance	frequency	period	non period	performance
19	A MAN is a network with a size between a _____ and _____.	WAN and LAN	WAN or LAN	LAN	WAN	WAN and LAN
20	When Two or more networks are connected they become an _____	network	inter network	internet connection	interconnection	inter network
21	The_____layer is responsible for providing services to the user.	presentation	datalink	application	network	application
22	The _____ layer is responsible for translation, compression encryption.	transport	data link	presentation	application	presentation
23	The_____layer is responsible for the delivery of a message from one process to another.	data link	transport	presentation	network	transport
24	A _____layer is responsible for the delivery of packets from the source to destination.	physical	data link	network	session	network

25	The _____layer is responsible for moving frames from one hop to the next.	data link	physical	network	presentation	data link
26	The _____layer is responsible for movements of bits from one hop to next.	data link	physical	transport	session	physical
27	RARP _____	reverse address resolution protocol	reverse address result protocol	reverse addess revolutinized protocol	reverse addess research protocol	reverse address resolution protocol
28	_____does not define any specific protocol.	TCP	HTTP	TCP/IP	SMTP	TCP/IP
29	The TCP/IP protocol suite was developed prior to the_____model.	OSI	ISO	TCP	IP	OSI
30	The _____layer is responsible for flow control.	session	presentation	application	transport	transport
31	Transmission errors are usually detected at the……..layer of OSI model	physical	datalink	network	transport	physical
32	Transmission errors are usually corrected at the……..layer of OSI model	network	transport	datalink	physical	transport
33	Datalink layer imposes a ……mechanism to avoid overwhelming the receiver	flow control	error control	access control	none of the above	flow control
34	Error control mechanism of datalink layer is achieved through a ……..added to the end of frame.	header	trailer	adress	frames	trailer
35	The datalink layer is responsible for moving……from one hop to next	packets	frames	signals	message	frames

36	_____ is the protocol used mainly to access data on the world wide web	communication	network	WWW	HTTP	HTTP
37	_____ Layer is responsible for delivery of a message from one process to another	Transport layer	Data Link layer	Physical layer	Network layer	Transport layer
38	_____ provides services to the user	Application Layer	Transport Layer	Session Layer	Presentation Layer	Application Layer
39	In TCP/IP application layer is the combination of ____,_____ and ___	Application , Network, Data Link	Application , Network, Physical	Application , Network, Session	Application Layer	Application Layer
40	Communication between a computer and a keyboard involves _____ transmission	Automatic	Half-duplex	Full-duplex	Simplex	Simplex
41	The _____ is the physical path over which a message travels	Path	Medium	Protocol	Route	Medium
42	The first Network	CNNET	NSFNET	ASAPNET	ARPANET	ARPANET
43	TCP/IP model does not have _____ layer but OSI model have this layer.	session layer	transport layer	application layer	network layer	session layer
44	Which layer is responsible for process to process delivery?	session layer	transport layer	application layer	network layer	transport layer
45	Which address identifies a process on a host?	physical address	logical address	port address	specific address	port address
46	Transmission data rate is decided by	Physical layer	transport layer	application layer	network layer	Physical layer
47	Which address identifies a host on the network?	MAC address	IP address	port address	Socket address	IP address
48	Delimiting and synchronization of data exchange is provided by	session layer	transport layer	application layer	network layer	session layer

49	In OSI model, when data is sent from device A to device B, the 5th layer to recieve data at B is	Application layer	network layer	transport layer	session layer	session layer
50	In TCP IP Model, when data is sent from device A to device B, the 5th layer to receive data at B is	Application layer	network layer	transport layer	session layer	Application layer
51	Combination of two or more networks are called	Internetwork	LAN	WAN	MAN	Internetwork
52	Elapsed time between an inquiry and a response is called ___.	Transit Time	Delay Time	Processing Time	Response Time	Response Time
53	Cable TV and DSL are examples of __	Internetwork	LAN	WAN	MAN	MAN
54	Newest evolution in LAN technology is __	Wireless	Internet	DSL	TV network	Wireless
55	Network that is usually owned privately and links devices in single office is called ___	Internetwork	LAN	WAN	MAN	LAN

UNIT-II

Transmission Media and LAN Topologies: Introduction, Guided Media: Twisted pair, Coaxial cable, 4L Optical fiber. Unguided media: Microwave, Radio frequency propagation, Satellite. **LAN Topologies**: Ring, bus, star, mesh and tree topologies. Network Devices: NIC, repeaters, hub, bridge, switch, gateway and router.

TRANSMISSION MEDIA

The transmission media is nothing but the physical media over which communication takes place in computer networks. In telecommunications, transmission media can be divided into two broad categories: guided and unguided. Guided media include twisted-pair cable, coaxial cable, and fiber-optic cable. Unguided medium is free space.

GUIDED MEDIA

A signal traveling along any of these media is directed and contained by the physical limits of the medium.

Twisted Pair Cable

A twisted pair cable is made of two plastic insulated copper wires twisted togethertoform a single media. Out of these two wires, only one carries actual signal andanother is used for ground reference. The twists between wires are helpful in reducingnoise (electro-magnetic interference) and crosstalk.

There are two types of twisted pair cables:
- Shielded Twisted Pair (STP) Cable
- Unshielded Twisted Pair (UTP) Cable

STP cables comes with twisted wire pair covered in metal foil. This makes it more indifferent to noise and crosstalk.
UTP has seven categories, each suitable for specific use. In computer networks, Cat-5, Cat-5e, and Cat-6 cables are mostly used. UTP cables are connected by RJ45 connectors.

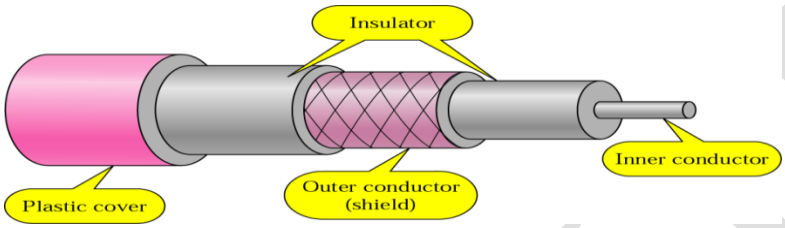
Applications

Twisted-pair cables are used in telephone lines to provide voice and data channels. The local loop-the line that connects subscribers to the central telephone officecommonly consists of unshielded

twisted-pair cables. The DSL lines that are used by the telephone companies to provide high-data-rate connections also use the high-bandwidth capability of unshielded twisted-pair cables.

Coaxial Cable

Coaxial cable has two wires of copper. The core wire lies in the center and it is made of solid conductor. The core is enclosed in an insulating sheath. The second wire is wrapped around over the sheath and that too in turn encased by insulator sheath. This all is covered by plastic cover.



Categories of Coaxial Cables

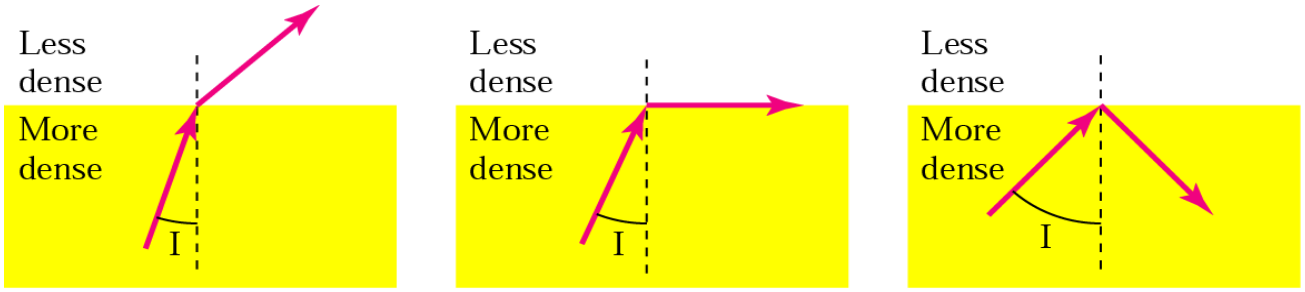
Category	*Impedance*	*Use*
RG-59	75 Ω	Cable TV
RG-58	50 Ω	Thin Ethernet
RG-11	50 Ω	Thick Ethernet

Because of its structure, the coax cable is capable of carrying high frequency signals than that of twisted pair cable. The wrapped structure provides it a good shield against noise and cross talk. Coaxial cables provide high bandwidth rates of up to 450 mbps. There are three categories of coax cables namely, RG-59 (Cable TV), RG-58 (Thin Ethernet), and RG-11 (Thick Ethernet). RG stands for Radio Government. Cables are connected using BNC connector and BNC-T. BNC terminator is used to terminate the wire at the far ends.

Fiber-Optic Cable

A fiber-optic cable is made of glass or plastic and transmits signals in the form of light. Fiber Optic works on the properties of light. Light travels in a straight line as long as it is moving through a single uniform substance. If a ray of light traveling through one substance suddenly it enters another substance (of a different density), the ray changes direction.. Figure below shows how a ray of light changes direction when going from a denser to a less dense

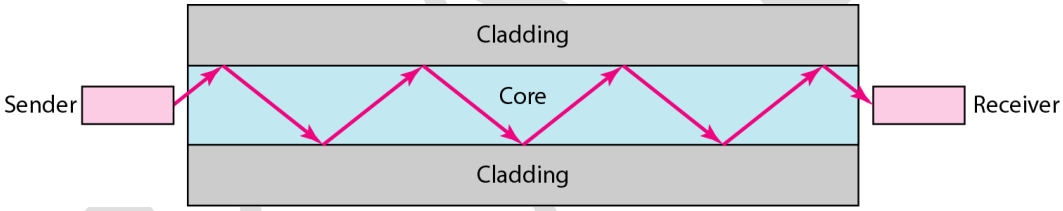
substance.



I < critical angle, refraction | I = critical angle, refraction | I > critical angle, reflection

Fiber Optic provides the highest mode of speed. It comes in two modes; one is single mode fiber and second is multimode fiber. Single mode fiber can carry a single ray of light whereas multimode is capable of carrying multiple beams of light.Fiber Optic also comes in unidirectional and bidirectional capabilities. To connect andaccess fiber optic special type of connectors are used. These can be SubscriberChannel (SC), Straight Tip (ST).

Optical fibers use reflection to guide light through a channel. A glass or plastic core is surrounded by a cladding of less dense glass or plastic. The difference in density of the two materials must be such that a beam of light moving through the core is reflected off the cladding instead of being refracted into it.

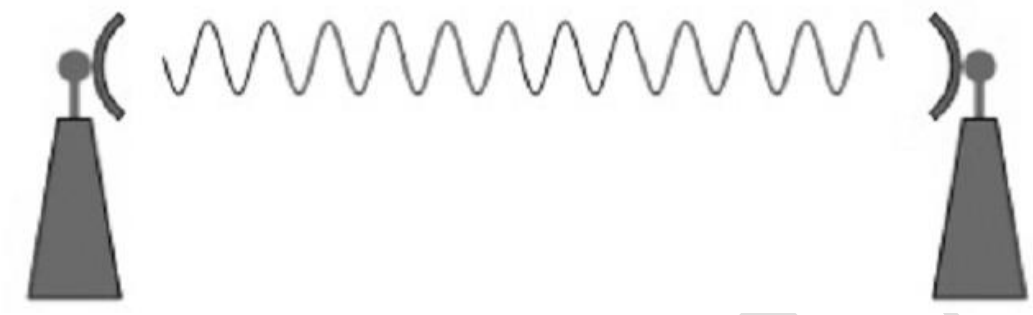


UNGUIDED MEDIA

Wireless transmission is a form of unguided media. Wireless communication involves no physical link established between two or more devices. Wireless signals are spread over in the air and are received and interpreted byappropriate antennas. When an antenna is attached to electrical circuit of a computer or wireless device, it converts the digital data into wireless signals and spread all over within its frequency range. The receptor on the other end receives these signals and converts them back to digital data.A little part of electromagnetic spectrum can be used for wireless transmission.

Microwave

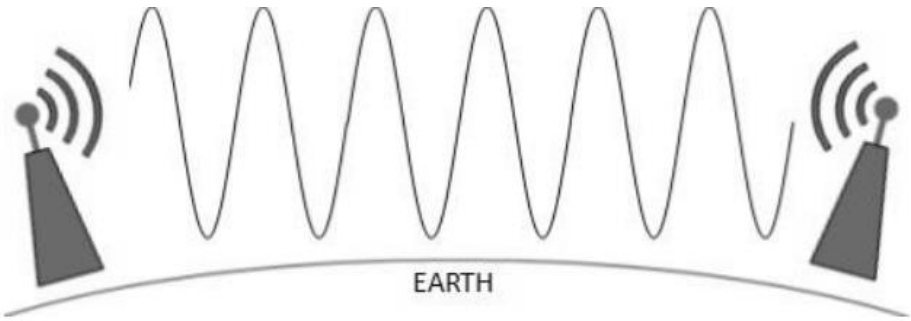
Electromagnetic waves above 100MHz tend to travel in a straight line and signals over them can be sent by beaming those waves towards one particular station. Because Microwaves travels in straight lines, both sender and receiver must be aligned to be strictly in line-of-sight. Microwaves can have wavelength ranging from 1mm – 1meter and frequency ranging from 300MHz to 300GHz.



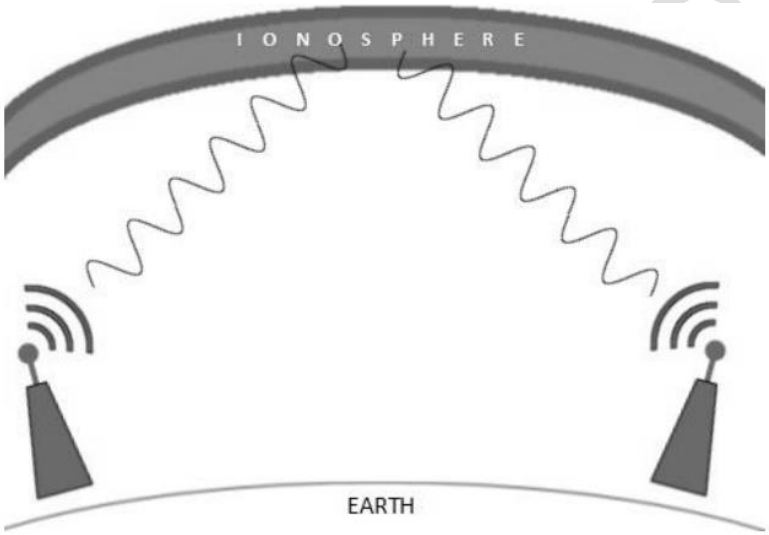
Microwave antennas concentrate the waves making a beam of it. As shown in picture above, multiple antennas can be aligned to reach farther. Microwaves have higher frequencies and do not penetrate wall like obstacles. Microwave transmission depends highly upon the weather conditions and thefrequency it is using.

Radio frequency propagation

- Radio frequency (RF) waves are easy to generate, can travel long distances, and can penetrate buildings easily, so they are widely used for communication, both indoors and outdoors.
- Radio waves also are omnidirectional, meaning that they travel in all directions from the source. Radio waves can have wavelength from 1mm – 100,000km and have frequency ranging from 3Hz (Extremely Low Frequency) to 300 GHz (Extremely High Frequency).
- Radio frequencies are sub-divided into six bands. Radio waves at lower frequencies can travel through walls whereas higher RF can travel in straight line and bounce back. The power of low frequency waves decreases sharply as they cover long distance.
- High frequency radio waves have more power. Lower frequencies such as VLF, LF, MF bands can travel on the ground up to 1000 kilometers, over the earth's surface.



Radio waves of high frequencies are prone to be absorbed by rain and other obstacles. They use Ionosphere of earth atmosphere. High frequency radio waves such as HF and VHF bands are spread upwards. When they reach Ionosphere, they are refracted back to the earth.

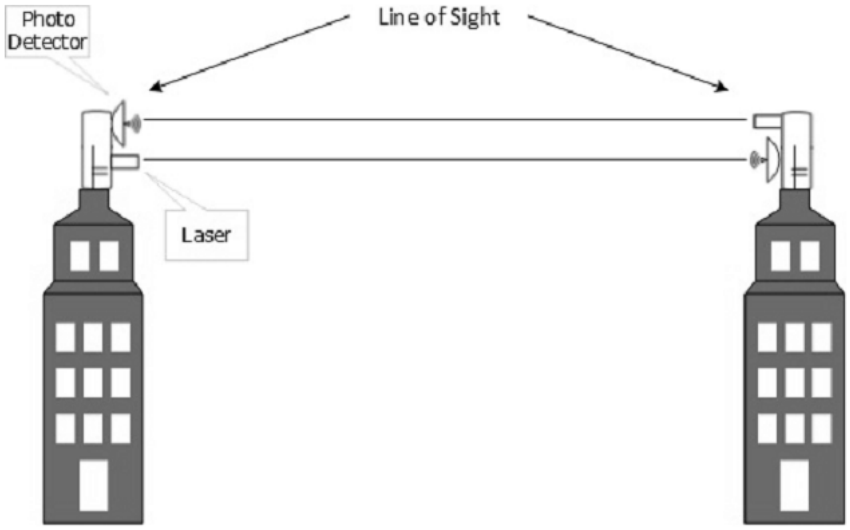


Infrared Transmission

Infrared wave lies in between visible light spectrum and microwaves. It has wavelength of 700nm to 1mm and frequency ranges from 300GHz to 430THz. Infrared wave is used for very short range communication purposes such as television and its remote. Infrared travels in a straight line hence it is directional by nature. Because of high frequency range, Infrared cannot cross wall-like obstacles.

Light Transmission

Highest most electromagnetic spectrum which can be used for data transmission is light or optical signaling. This is achieved by means of LASER. Because of frequency light uses, it tends to travel strictly in straight line. Hence the sender and receiver must be in the line-of-sight. Because laser transmission is unidirectional, at both ends of communication the laser and the photo-detector needs to be installed. Laser beam is generally 1mm wide hence it is a work of precision to align two far receptors each pointing to lasers source.

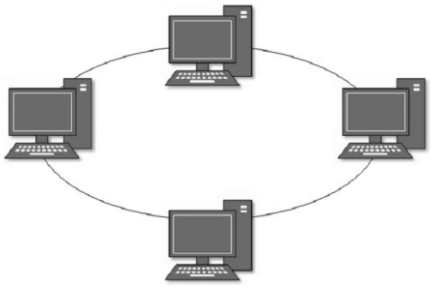


Laser works as Tx (transmitter) and photo-detectors works as Rx (receiver).Lasers cannot penetrate obstacles such as walls, rain, and thick fog. Additionally, laser beam is distorted by wind, atmosphere temperature, or variation in temperature in the path. Laser is safe for data transmission as it is very difficult to tap 1mm wide laser without interrupting the communication channel.

LAN TOPOLOGIES

Ring Topology

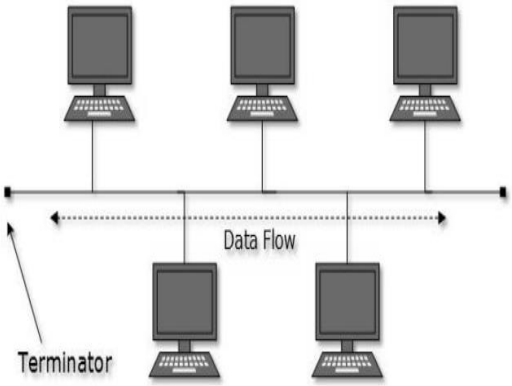
In ring topology, each host machine connects to exactly two other machines, creating a circular network structure. When one host tries to communicate or send message to a host which is not adjacent to it, the data travels through all intermediate hosts. To connect one more host in the existing structure, the administrator may need only one more extra cable.



Bus Topology

In case of Bus topology, all devices share single communication line or cable. Bus topology may have problem while multiple hosts sending data at the same time. Therefore, Bus topology either uses CSMA/CD technology or recognizes one host as Bus Master to solve the issue. It is one

of the simple forms of networking where a failure of a device does not affect the other devices. But failure of the shared communication line can make all other devices stop functioning.

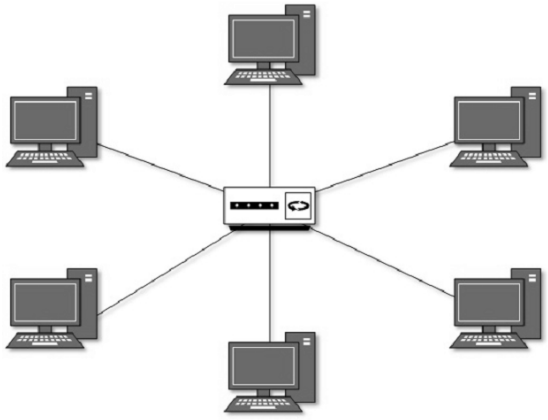


Both ends of the shared channel have line terminator. The data is sent in only one direction and as soon as it reaches the extreme end, the terminator removes the data from the line.

Star Topology

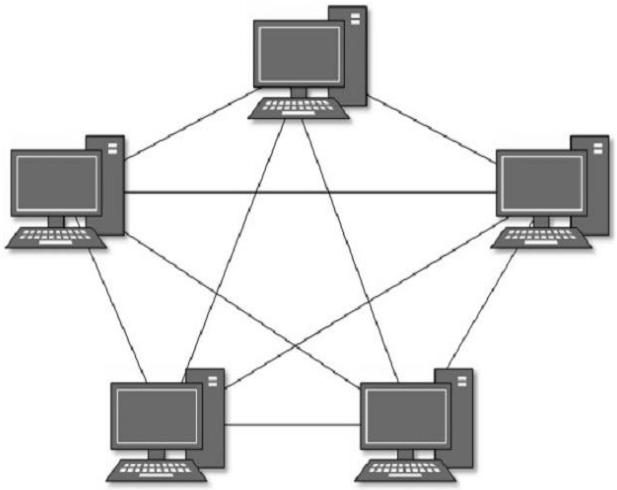
All hosts in Star topology are connected to a central device, known as hub device, using a point-to-point connection. That is, there exists a point to point connection between hosts and hub. The hub device can be any of the following:

- Layer-1 device such as hub or repeater
- Layer-2 device such as switch or bridge
- Layer-3 device such as router or gateway



Mesh Topology

In this type of topology, a host is connected to one or multiple hosts. This topology has hosts in point-to-point connection with every other host or may also have hosts which are in point-to-point connection with few hosts only.

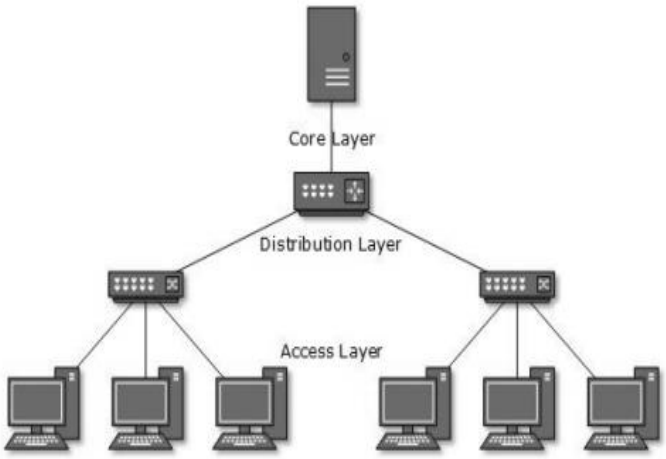


Hosts in Mesh topology also work as relay for other hosts which do not have directpoint-to-point links. Mesh technology comes into two types:

- Full Mesh: All hosts have a point-to-point connection to every other host in the network. Thus for every new host n(n-1)/2 connections are required. It provides the most reliable network structure among all network topologies.
- Partially Mesh: Not all hosts have point-to-point connection to every other host. Hosts connect to each other in some arbitrarily fashion. This topology exists where we need to provide reliability to some hosts out of all.

Tree Topology

Also known as Hierarchical Topology, this is the most common form of network topology in use presently. This topology imitates as extended Star topology and inherits properties of Bus topology. This topology divides the network into multiple levels/layers of network. Mainly in LANs, a network is bifurcated into three types of network devices. The lowermost is access-layer where computers are attached. The middle layer is known as distribution layer, which works as mediator between upper layerand lower layer. The highest layer is known as core layer, and is central point of the network, i.e. root of the tree from which all nodes fork.



NETWORK DEVICES

NIC

A network interface card is a computer hardware component designed to allow computers to communicate over a computer network. It is both an OSI layer 1 (physical layer) and layer 2 (data link layer) device, as it provides physical access to a networking medium and 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. Most motherboards today come equipped with a network interface card in the form of a controller, with the hardware built into the board itself, eliminating the need for a standalone card.

Repeater

A repeater operates at the physical layer. Its job is to regenerate the signal over the same network before the signal becomes too weak or corrupted so as to extend the length to which the signal can be transmitted over the same network. An important point to be noted about repeaters is that they do not amplify the signal. When the signal becomes weak, they copy the signal bit by bit and regenerate it at the original strength. It is a 2 port device.

Hub

A hub is basically a multiport repeater. A hub connects multiple wires coming from different branches, for example, the connector in star topology which connects different stations. Hubs cannot filter data, so data packets are sent to all connected devices. In other words, collision domain of all hosts connected through Hub remains one. Also, they do not have intelligence to find out best path for data packets which leads to inefficiencies and wastage.

Types of Hub

Active Hub: - These are the hubs which have their own power supply and can clean , boost and relay the signal along the network. It serves both as a repeater as well as wiring center. These are used to extend maximum distance between nodes.

Passive Hub: - These are the hubs which collect wiring from nodes and power supply from active hub. These hubs relay signals onto the network without cleaning and boosting them and can't be used to extend distance between nodes.

Bridge

A bridge operates at data link layer. A bridge is a repeater, with add on functionality of filtering content by reading the MAC addresses of source and destination. It is also used for interconnecting two LANs working on the same protocol. It has a single input and single output port, thus making it a 2 port device.

Types of Bridges

Transparent Bridge: As the name signifies, it appears to be transparent for the other devices on the network. The other devices are ignorant of its existence. It only blocks or forwards the data as per the MAC address.

Source Route Bridge: It derives its name from the fact that the path which packet takes through the network is implanted within the packet. It is mainly used in Token ring networks.

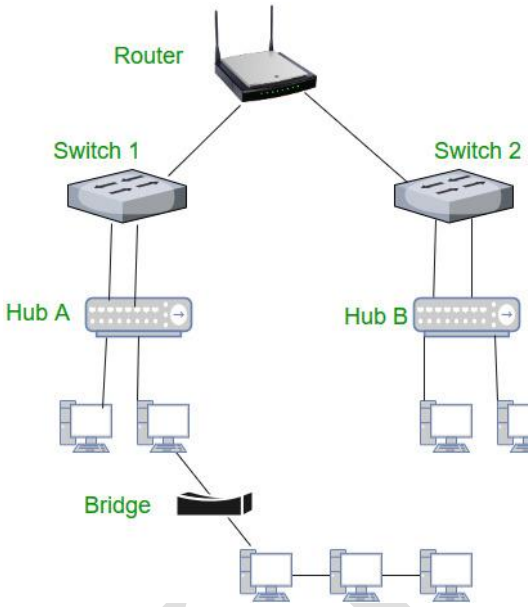
Translational Bridge: The process of conversion takes place via Translational Bridge. It converts the data format of one networking to another. For instance Token ring to Ethernet and vice versa.

Switch

A switch is a multi port bridge with a buffer and a design that can boost its efficiency (large number of ports imply less traffic) and performance. Switch is data link layer device. Switch can perform error checking before forwarding data, that makes it very efficient as it does not forward packets that have errors and forward good packets selectively to correct port only. In other words, switch divides collision domain of hosts, but broadcast domain remains same.

Routers

A router is a device like a switch that routes data packets based on their IP addresses. Router is mainly a Network Layer device. Routers normally connect LANs and WANs together and have a dynamically updating routing table based on which they make decisions on routing the data packets. Router divide broadcast domains of hosts connected through it.



Gateway

A gateway, as the name suggests, is a passage to connect two networks together that may work upon different networking models. They basically works as the messenger agents that take data from one system, interpret it, and transfer it to another system. Gateways are also called protocol converters and can operate at any network layer. Gateways are generally more complex than switch or router.

CLASS: I B.Sc IT COURSE CODE: 18ITU203 BATCH-2018-2021
COURSE NAME: COMPUTER NETWORKS AND INTERNET TECHNOLOGIES
UNIT: II (Transmission Media and LAN Topologies)

POSSIBLE QUESTIONS

Part-B (2 marks)

1. Define guided media
2. Define unguided media
3. What is ring topology?
4. What is bus topology?
5. What is star topology?
6. What is mesh topology?
7. Define hub
8. List the types of bridges
9. Write the use of repeater.

Part-C (8 marks)

1. Explain twisted pair and coaxial cable with neat diagram
2. Discuss on optical fibre cable
3. Write note on Microwave, Radio frequency propagation, Satellite
4. Explain any three network topologies in detail
5. Elaborate on the following network devices NIC, repeaters, hub, bridge, switch, gateway and router

Questions	Option1	Option2	Option3	Option4	Answer
Transmission media are directly controlled by the	physical layer	data link layer	network layer	session layer	physical layer
frequencies between 3 kHz and 1 GHz are called	High frequency	Infrared	Microwaves	radio waves	radio waves
Ray of light refracts and moves closer to surface then angle of incidence is	equal to the critical angle	not equal to the critical angel	less than the critical angle	greater than the critical angle	less than the critical angle
Guided media provides a conduit from one device to another, includes	twisted pair cable	fiber optic cable	coaxial cable	All	All
RG-59 is used in	radio	thick Ethernet	thin Ethernet	cable TV	cable TV
Twisted pair cable in which metal casing improves penetration of noise or crosstalk is called	insulated twisted pair cable	Shielded twisted pair cable	Unshielded twisted pair cable	Both A & B	Shielded twisted pair cable
Line-of-sight propagation lies above	3 KHz	30 MHz	15 MHz	2 KHz	30 MHz
In single mode, decrease in density results in a critical angle that is close enough to	180 degree	360 degree	0 degree	90 degree	90 degree
Optical fibers use reflection to guide light through a	channel	metal wire	light	plastic	channel
In electromagnetic spectrum for wireless communication, reserved range for Radio waves and microwaves is known as	ground propagation	sky propagation	line-of-sight propagation	radio propagation	ground propagation
Physical or logical arrangement of network is	Topology	Routing	Networking	repeater	Topology
In this topology there is a central controller or hub	Star	Mesh	Ring	Bus	Star
This topology requires multipoint connection	Star	Mesh	Ring	Bus	Bus
In mesh topology, devices are connected via	Multipoint link	Point to point link	No Link	client/server	Point to point link
Bus, ring and star topologies are mostly used in the	LAN	MAN	WAN	Internetwork	LAN
Combination of two or more topologies are called	Star Topology	Bus Topology	Ring topology	Hybrid	Hybrid
What piece of hardware is usually at the centre of a star network?	Modem	Hub	Router	Server	Hub
If a computer in a star network fails, the network will:	Still work un affected	Work with limited capabilities	Cease to function	None	Still work un affected
A ring network:	Requires additional software to function efficiently	Is fast	Is cheap	Is reliable	Requires additional software to function efficiently
A combination of the bus and star topologies is called a:	Combo network	Starbus network	Tree network	Ring network	Tree network
Which of the following networks will allow an Internet connection?	Bus	Star	Ring	Tree	All options
The Internet is an example of which topology?	Bus	Mesh	Ring	Tree	Mesh
What is th benefit of networking?	File sharing	Easier acceess to resources	Easier backups	All	All
Which pf the following is not the network devices?	Gateways	Linux	Routers	Firewalls	Linux
What is the size of MAC address	16 bits	32 bits	48 bits	64 bits	48 bits
MAC adress is an example of	Transport layer	Data link layer	Application layer	Physical layer	Data link layer
Which of the following can be software?	Router	Firewall	Gateway	Modem	Firewall
Layer-2 switch is also called	Multiport hob	Multiport switch	Multiport bridge	Multiport NIC	Multiport bridge
Diffference between T568A and T568B is	Difference in wire color	Difference in number of wires	Just different length of wires	Just different manufacturer standards	Just different manufacturer standards
The meaning of straight-through cable is	Four wire pairs connect to the same pin on each end	The cable which directly connects computer to computer	Four wire pairs not twisted with each other	Tha cable which is not twisted	Four wire pairs connect to the same pin on each end
What is the difference between a switch and a hub?	Switches operate at physical layer while hubs operate at data link layer	Switches operate at data link layer while hubs operate at transport layer	Switches operate at data link layer while hubs operate at physical layer	Switches operate at transport layer while hubs operate at physical layer	Switches operate at data link layer while hubs operate at physical layer
NAT stands for	network address transformer	network address translator	network address translation	network address tranmitter	network address translation

A network router joins two _____ together	Computers	Switches	Networks	Gateway	Networks
A network point that provides entrance into another network is called as _____	Node	Gateway	Switch	Router	Gateway
MAC addresses are also known as	Hardware address	Physical address	IP address	Hardware address and Physical address	Hardware address and Physical address
From the options below, which suits best for MODEM?	a device that modulates an analog carrier signal to encode digital information	a device that modulates a digital carrier signal to encode analog information	a device that modulates an analog carrier signal to decode digital information	a device that modulates a digital carrier signal to decode analog information	a device that modulates an analog carrier signal to encode digital information
What is the function of Network Interface Cards?	connects the clients, servers and peripherals to the network through a port	allows you to segment a large network into smaller, efficient networks	connects networks with different protocols like TCP/IP	boost the signal between two cable segments or wireless access points	connects the clients, servers and peripherals to the network through a port
A device which is used to boost the signal between two cable segments or wireless access points is	Booster	Repeater	Switch	Router	Switch
A device that provides a central connection point for cables is –	Switch	Hub	Gateway	Proxy Server	Gateway
A device that helps prevent congestion and data collisions –	Switch	Hub	Gateway	Proxy Server	Switch
A device that connects networks with different protocols –	Switch	Hub	Gateway	Proxy Server	Gateway
A device that is used to connect a number of LANs is –	Router	Repeater	Bridge	Switch	Router
Full form of NIC	New Internet Connection	Network Interface Card	Network Interface Connection	Net Interface Card	Network Interface Card
Which of thwe following are the type of twisted pair cable?	Coxial cable	Shielded twisted pair	Unshielded twisted pair	Shielded twisted pair & Unshielded twisted pair	Shielded twisted pair & Unshielded twisted pair
--------- supports datarate upto 1000Mbps	CAT 1	Thinnet	CAT 5	CAT 5e	CAT 5e
Which color coding of cable is used to connect similar devices?	Straight cable	Cross over cable	Serial cable	All	Cross over cable
Hub is a ------- device and Switch is a ------- device	Unicast, Multicast	Multicast, Unicast	Broadcast, Unicast	None	Broadcast, Unicast
Switch is a device of -------- layer of OSI model	Physical	Data link	Application	Session	Data link
Star topology is based on a central device that can be --------	Hub	Switch	Hub and Switch	Repeater	Hub and Switch

UNIT III

INTERNET TERMS AND APPLICATIONS

Internet Terms: Web page, Home page, website, internet browsers, URL, Hypertext, ISP, Web server, download and upload, online and offline. Internet Applications: www, telnet, ftp, e-mail, social networks, search engines, Video Conferencing, e-Commerce, m-Commerce, VOIP, blogs.

WEB PAGE

A document which can be displayed in a web browser such as Firefox, Google Chrome, Opera, Microsoft Internet Explorer or Edge, or Apple's Safari. These are also often called just "pages."

A **web page** or **webpage** is a document commonly written in HTML (Hypertext Markup Language) that is accessible through the Internet or other networks using an Internet browser. A web page is accessed by entering a URL address and may contain text, graphics, and hyperlinks to other web pages and files.

The first web page was created at CERN by Tim Berners-Lee on August 6, 1991. You can visit and browse the first website and the first web page at the http://info.cern.chaddress.

HOME PAGE

A **home page** or a **start page** is the initial or main web page of a website or a browser. The initial page of a website is sometimes called **main page** as well.

A home page is generally the main page a visitor navigating to a website from a web search engine.

it may also serve as a landing page to attract visitors.

The home page is used to facilitate navigation to other pages on the site by providing links to prioritized and recent articles and pages, and possibly a search box.

For example, a news website may present headlines and first paragraphs of top stories, with links to full articles, in a dynamic web page that reflects the popularity and recentness of stories.

Meanwhile, other websites use the homepage to attract users to create an account. Once they are logged in, the homepage may be redirected to their profile page. This may in turn be referred to as the "personal home page".

A website may have multiple home pages, although most have one.[6] Wikipedia, for example, has a home page at wikipedia.org, as well as language-specific home pages, such as en.wikipedia.org and de.wikipedia.org.

Browser home page

A home page also refers to the first page that appears upon opening a web browser, sometimes called the **start page**, although the home page of a website can be used as a start page. This start page can be a website, or it can be a page with various browser functions such as the display of thumbnails of frequently visited websites. Multiple websites can be set as a start page, to open in different tabs. Some websites are intended to be used as start pages, such as iGoogle, My Yahoo!, and MSN.com, and provide links to commonly used services such as webmail and online weather forecasts.

History of home pages

In the early days of the World Wide Web in the first half of the 1990s, an important part of web pages belonged to students or teachers with a UNIX account in their university. System administrators of such systems installed an HTTP server pointing its root directory to the directory containing the users accounts. On UNIX, the base directory of an account is called "home", and the `HOME` environment variable contains its path (for example `/home/my_username`). The URL of the home page usually has the format `https://example.edu/~my_username/`.[11] Thus the term home page appeared and then spread to its current usage.

A personal home page historically has served as a means of self-portrayal, job-related presentation, and pure enjoyment, giving way to professional advancement and social interaction.[12] Owing to the rise of social media sites, personal home pages are no longer as common as during the mid-late 1990s and early-2000s.

A personal web page is also commonly called a home page, although such websites can contain many pages.[13] In Germany the term "homepage" is often used as a synonym for the term "website".

A home page can also be used outside the context of web browsers, such as to refer to the principal screen of a user interface, frequently referred to as a home screen on mobile devices such as mobile phones.

WEBSITE

A collection of web pages which are grouped together and usually connected together in various ways. Often called a "web site" or simply a "site."

A **site** or **website** is a central location of various web pages that are all related and can be accessed by visiting the home pageof the website using a browser.

There are billions of websites on the Internet today that can be broken into one of the following types of website categories.

For example, a website may also be a forum, webmail, blog, or search engine.

Archive website

An **archive website** is a site that has been created to keep a record of one or more other websites. The Internet Archive is the best example of an archive website.

Blog (weblog)

A **blog** is a website that has been typically created by an individual to keep a list of entries that interests them. See our weblog definition for a full description, services used to create a blog, and related pages. A **Microblog website** is also another popular form of blogging website that limits the number of characters someone can post in each blog entry. Twitter is a popular example of a social networking website that can be a place to microblog.

Business website and corporate website

A **business website** or **corporate website** is created to provide account information and access to customers, partners, clients, and potential customers.

Community website

A community website is a website or section of a website that helps bring the visitors visiting the site together using chat, forums, or another form of bulletin boards.

Content website and information website

A **content website** and **information website** is a website that has been created with the intention of creating original and unique content that is often related to a specific category. For example, Computer Hope could be considered a content site that is a site with computer-related content. Other categories could include a **political website** that has content relating to politics or a political view or a **religious website** with information about a specific religion.

Dating website

A **dating website** is a site set up to help connect people who may be interested in meeting other people or dating other people. Most dating websites require a small fee, require a description of yourself, and often has a series of questions to help find people that would best match your interests.

E-commerce website

An **e-commerce (electronic commerce) website** is any site that has been created with the intention of selling online goods or services. Amazon is a perfect example of an e-commerce website. An e-commerce website may be broken down even further into one of the following subcategories.

An **affiliate website** is a website created with the intention of selling third-party products. For example, Amazon has an affiliate program that allows anyone to link to their site and make a commission if anything is purchased after the link is clicked. An affiliate website should not be confused with an e-commerce website.

An **auction website** is a website that allows other people to sell their goods or services. For example, eBay is one of the most well known online auction websites. See our online auction page for further information and examples.

A **classified ads website** is a site that allows anyone to list goods or services usually for free or at a small cost. Craigslist is a good example of a classified ads website.

A **crowdfunding website** is a website with pages that have been set up to help support a business, person, or another cause by making a one-time payment or a monthly payment. A good example of a crowdfunding website is Kickstarter.

Gaming website

A **gaming website** is any website that features games that can be played on the website. Often these online games are created using HTML5, Flash, or Java. Gaming websites should not be confused with a gaming content website that has content relevant to gaming with no actual games to play on the website.

Government website

A **government website** is a department, local, or state government site that has been created to help inform the public about a department or connect the public to government services. A local government website may also be set up to help promote tourism.

Help and Q&A website

A **help website** and **questions and answers website** is a site where anyone can go to post questions about any topic imaginable and where visitors to that site can help answer those questions. A full listing of help websites where you can ask any question is on the link below.

- Where can I ask a question on the Internet?

Malicious website

A **malicious website** is any website that has been set up with the intention of infecting another computer or collecting personal data. For example, a **malware website** is a site created with the intention of infecting any visitor with malware, spyware, or a trojan horse. These type of sites could have a download that is infected, and if downloaded infects your computer or scripts that steal your computer cookies you use to log into a website.

Other common malicious websites include **phishing websites**. These sites are designed to look like other official sites (e.g., your bank) with the hope that they can phish sensitive information such as your username and password.

Fake news websites are another type of malicious website that is created to appear to be a legitimate source of news with the intention of helping to spread fear and lies.

- How to protect yourself while on the Internet.

Media sharing website

A **media sharing website** is any website that specializes in allowing visitors to share one or more types of media. For example, YouTube is a site for sharing video media, SoundCloud is a site for sharing music, Flickr is a place to share photos, and DeviantArt is a page for sharing art.

Mirror website

A **mirror website** is a complete duplicate of another website that is used when a website becomes overloaded. It helps with a website's speed in different parts of the world. See our mirror definition for further information. Also, although similar, a mirror site should not be confused with a scrapper website or a CDN.

News website

A **news website** is a site dedicated to giving the latest local or world news. A news site may also be dedicated to a specific topic. For example, many computer related news websites are dedicated to talking about the latest computer and technology related news.

P2P website and Torrent website

A **P2P website** and **Torrent website** are sites created to list available torrents that can be downloaded using a file sharing program.

A **warez website** is a site is similar to a torrent website except that it typically stores and hosts the music, video, and software that allows anyone to download it to their computer. Typically when referring to a warez website, it is describing a site where copyrighted material is illegally downloaded.

Personal website

A **personal website** is a site created by an individual that talks about their personal life, family, life experiences, and maybe contains a résumé. Today, many people are creating personal websites as a blog or using a social networking website as a place to store information about themselves.

Personality website

A **personality website** is any website that covers an individual such as an artist, celebrity, musician, author, or any other person. These types of websites may be set up by the person affiliated with the person such as a publicist or agency or by a fan of the personality.

Review website

A **review website** is any site that focuses on reviews about a product or service. For example, Yelp allows consumers to review businesses in their area. Other review sites may review other things such as movies or products. Also, many e-commerce sites will have reviews from people who've purchased the product they're selling.

School website

A **school website** is a site created to represent a local school or college. Typically school sites will have an overview of a school and give students and parents a place a place to log in to a student's account and review grade and other school-related information.

Scrapper website

A **scrapper website** is a website that is illegally stealing (scrapping) another website's content. Doing this could allow the person to generate advertising revenue if enough traffic was driven to the scrapper website. However, these types of sites are against all advertisers' TOS (terms of service) and when caught will be blocked by the company providing the advertising. A scrapper website should not be confused with a mirror website, which is a copy of a site set up with permission.

Search engine website

A **search engine website** is a website dedicated to helping people find information on the Internet. Google is the best example of a search engine website. See our search engine definition for further information on search engines and related links.

Social networking website

A **social networking website** connects users with friends, family, celebrities, groups, and organizations. The service is usually free, on the condition that the website may collect information about the user and sell it to any domestic or foreign entity. Facebook and Twitter are both good examples of a social networking website. See our social networking definition for other examples of social networks and further information.

Social news website

A **social news website** is a site that generates its content from its members and once posted all other members can vote if they enjoyed or liked the story. Reddit is an example of a social news website that allows everyone to post almost anything and is a great place to find things that would most interest you on the Internet.

Webcomic website

A **webcomic website** is a site that posts a comic strip daily, weekly, or monthly.

Webmail website

A **webmail website** is a website that a person to view, send, and receive e-mail without the need of software. A good example of a webmail program is Gmail. See our webmail definition for other examples, information, and related links.

Wiki website

A **wiki website** is a site that is created using a Wiki software and is often edited and updated by more than one person.

Internet browsers

URL

Uniform Resource Identifier (URI) is used to uniquely identify resources on the web and **UNICODE** makes it possible to built web pages that can be read and write in human languages.

A Uniform Resource Locator (URL), colloquially termed a web address, is a reference to a web resource that specifies its location on a computer network and a mechanism for retrieving it. A URL is a specific type of Uniform Resource Identifier (URI), although many people use the two terms interchangeably

URLs occur most commonly to reference web pages (http), but are also used for file transfer (ftp), email (mailto), database access (JDBC), and many other applications.

Most web browsers display the URL of a web page above the page in an address bar. A typical URL could have the form http://www.example.com/index.html, which indicates a protocol (http), a hostname (www.example.com), and a file name (index.html).

Tim Berners-Lee and the Internet Engineering Task Force working group is credited with developing the URL in 1994. It is formally specified in RFC 1738.

Syntax

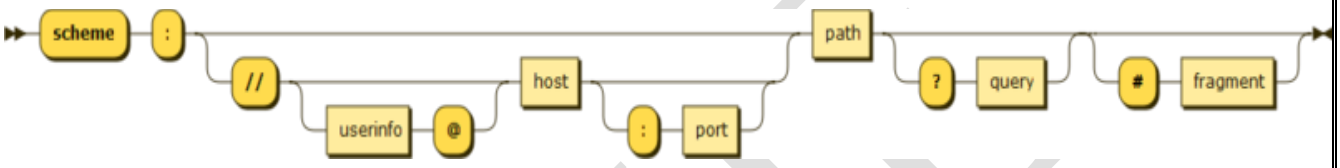
Every HTTP URL conforms to the syntax of a generic URI. The URI generic syntax consists of a hierarchical sequence of five components:

```
URI = scheme:[//authority]path[?query][#fragment]
```

where the authority component divides into three *subcomponents*:

```
authority = [userinfo@]host[:port]
```

This is represented in a syntax diagram as:



All URLs are presented in the following order:

- Scheme name
- Colon and two slashes
- Location of the server
- The port (optional) and the location of the resource on the server
- Fragment identifier (optional)

So, the format will look like this:

scheme://location:port/file-on-server.htm?querystring=1

HYPERTEXT

Hypertext is text displayed on a computer display or other electronic devices with references (hyperlinks) to other text that the reader can immediately access.[1] Hypertext documents are interconnected by hyperlinks, which are typically activated by a mouse click, keypress set or by touching the screen. Apart from text, the term "hypertext" is also sometimes used to describe tables, images, and other presentational content formats with integrated hyperlinks. Hypertext is one of the key underlying concepts of the World Wide Web,[2] where Web pages are often written in the Hypertext Markup Language (HTML). As implemented on the Web, hypertext enables the easy-to-use publication of information over the Internet.

"hypertext" has become generally accepted for branching and responding text, but the corresponding word "hypermedia", meaning complexes of branching and responding graphics, movies and sound – as well as text – is much less used. Instead they use the strange term "interactive multimedia": this is four syllables longer, and does not express the idea of extending hypertext.

—Nelson, Literary Machines, 1992

A method of organizing and accessing text or other data, such as tables, presentational content and images, through the use of hyperlinks. Today, anyone who has been on the Internet is familiar with hypertext as it is in every link they click or tap on their screen.

Types and uses of hypertext

Hypertext documents can either be static (prepared and stored in advance) or dynamic (continually changing in response to user input, such as dynamic web pages). Static hypertext can be used to cross-reference collections of data in documents, software applications, or books on CDs. A well-constructed system can also incorporate other user-interface conventions, such as menus and command lines. Links used in a hypertext document usually replace the current piece of hypertext with the destination document. A lesser known feature is StretchText, which expands or contracts the content in place, thereby giving more control to the reader in determining the level of detail of the displayed document. Some implementations support transclusion, where text or other content is included by reference and automatically rendered in place.

Hypertext can be used to support very complex and dynamic systems of linking and cross-referencing. The most famous implementation of hypertext is the World Wide Web, written in the final months of 1990 and released on the Internet in 1991.

Hypertext is a concept that was mentioned in a 1945 Atlantic Monthly article by Vannevar Bush. In the article, he hypothesized a photoelectric mechanical device called a Memex (for "memory extension") that could create and follow links between microfiche documents.

This concept was later coined by Ted Nelson in 1965 who worked for and with Andries van Dam at Brown University. Andries, with the help of Ted and other Brown University students, created an

HES (Hypertext Editing System). However, the first public display of hypertext was by Douglas Engelbart on December 9, 1968, at The Mother of All Demos.

ISP

An ISP is also sometimes referred to as an **IAP (Internet access provider)** and **online service provider.**

What is an ISP?

The ISP, short for 'Internet Service Provider', is the company that connects your personal computer, notebook, netbook, PDA, mobile device, game station, etc. to the Internet. Another name for ISP is IAP, or Internet Access Provider.

ISP History

The first ISP is widely believed to be Telenet, which was the first commercial version of ARPANET introduced in 1974. The first ISP for the Internet we know and use today is considered to be "The World" who started serving customers in 1989.

Internet access technologies

The connection between your Internet enabled device and the global network is executed through a specific digital data transmission technology. It represents the transfer of information packets through an Internet Protocol route.

According to the method of data transmission, the Internet access that ISPs provide to users can be divided into several types, the most popular of which are:

Dial-up Internet access

This is the oldest method of providing access to the Internet. It uses a telephone line to perform a modem-to-modem connection. For that purpose, the user's computer is attached to a telephone line enabled modem device, which dials into the node of the ISP and starts transferring data between the

servers that store websites the user wants to see and their Internet connected device. The dial-up Internet is today considered outdated in most Internet societies due to the slow connection speed it ensures (about 40-50 kbit/s.). However, the wide availability of telephone access makes this type of Internet access the only alternative for remote areas that remain off the broadband network. It is also the least expensive Internet access service and is preferred by users on a tight budget.

DSL

DSL, short for 'digital subscriber loop' or 'digital subscriber line', is an advanced version of the dial-up Internet access method. In contrast to dial-up, DSL uses high frequency to execute a connection over the local telephone network. This allows the Internet and the phone connections to be run on one and the same telephone line. The digital subscriber line technology ensures an Asymmetric Digital Subscriber Line (ADSL), where the upload speed is lower than the download speed, and a Symmetric Digital Subscriber Line (SDSL), offering equal upload and download speeds. Of them both, ADSL is much more popular and is even known as just DSL to users.

Cable Internet

The cable Internet is among the most preferred methods for providing residential Internet access. Technically speaking, it represents a broadband Internet access method, using the high-bandwidth cable television network to transmit data between the global network and the households. To use cable Internet you will need a cable modem at home that will be connected with the CMTS (Cable Modem Termination System) of your cable ISP. The cable Internet access can be offered together with a cable television subscription and separately, for customers' convenience. The second case incurs higher subscription fees due to the extra equipment installation costs.

Wireless Broadband (WiBB)

This is a new-generation broadband Internet access technology, allowing the delivery of high-speed wireless Internet within a large area. Wireless broadband ISPs (WISPs) ensure connection speeds that come close to the wired broadband speeds provided by DSL and cable ISPs. To get wireless broadband you need to place a specific dish on your house roof or apartment balcony and point it

to the transmitter of your WISP. This type of Internet access is used as an alternative to the wired broadband connection in remote areas.

Wi-Fi Internet

Wi-Fi (from Wireless Fidelity) has become one of the most widely distributed Internet access methods, with the growing usage of portable computers and Internet enabled mobile devices, such as smart phones, PDAs, game consoles, etc. In this sense, it is the most mobile Internet access method, since you are able to use it everywhere as long as you are located within the scope of coverage, i.e. within the range of an Internet connected wireless network. Due to its ability to serve mobile devices, Wi-Fi is used in public places such as airports, hotels and restaurants to provide Internet access to customers. There are also specialized Wi-Fi hotspots where the service is either free or paid. Some of the largest cities in the world are in the process of building Wi-Fi networks that cover all the public places in the central areas.

ISDN

Another online data transmission method worth considering is ISDN or the Integrated Services Digital Network. ISDN represents a telephone system network, integrating a high-quality digital transmission of voice and data over the ordinary phone line. Ensuring a much better data transmission over the phone line than an analog line could allow, the ISDN offers a fast upstream/downstream Internet connection speed of 128 kbit/s. This speed level can be considered as a broadband speed as opposed to the narrowband speed of standard analog 56k telephone lines.

Ethernet

Another Internet access type worth mentioning is Ethernet - the most widespread wired LAN (local area network) technology, also used in wireless LANs. The Ethernet technology may ensure various speed levels and can thus be divided into several types: regular Ethernet, providing transmission speeds of up to 10 mbits/s, fast Ethernet, offering up to 100 mbits/s, gigabit Ethernet, supporting 1 gbit/s and 10-Gbit Ethernet, coming at up to 10 gbits/s.

Web server

Web servers use HTTP to allow access to the Internet. They search through and use HTML files that are sent to web browsers and translated so the user can understand them. It is also capable of accessing and storing other types of files, but they are often attached in some way to the HTML files it has, such as having images that are placed upon the HTML.

Web Servers Used For

Web servers are primarily used to store process and deliver the pages of a website to users. In layman's terms, this means that web servers are what make websites appear when you type in a URL.

Types of Web Servers:

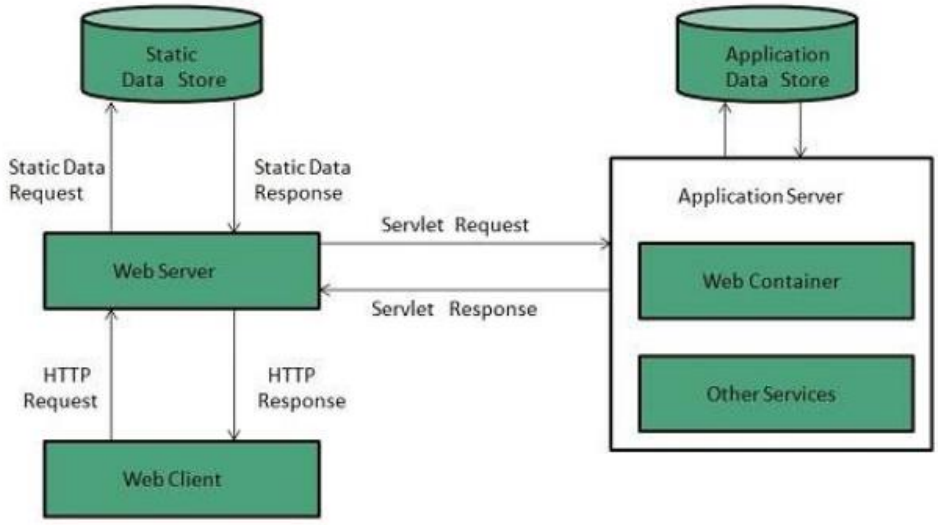
There are 4 primary web servers:

Apache (provided by Apache)

IIS (provided by Microsoft)

nginx (provided by NGINX, Inc. and pronounced like "Engine X")

and GWS (provided by Google and short for Google Web Server)



DOWNLOAD

Download is a term used to describe the process of copying data from one computer to another, either over a network or modem. For example, each time you visit a web page on the Internet, you download the information on the page, including any pictures, to your computer. The term download is often associated with pictures, songs, videos, and programs.

UPLOAD

Uploading is the transmission of a file from one computer system to another, usually larger computer system. From a network user's point-of-view, to upload a file is to send it to another computer that is set up to receive it.

Uploading is the process of putting web pages, images and files onto a web server.

ONLINE

- Online indicates a state of connectivity.
- Similar meaning is also given by the prefixes "cyber" and "e", as in the words "cyberspace", "cybercrime", "email", and "ecommerce".
- During the 19th century, the term "on line" was commonly used in both the railroad and telegraph industries. For railroads, a signal box would send messages down the line (track), via a telegraph line (cable), indicating the track's status: "Train on line" or "Line clear".

Functions of Online

1. Computer or device connected to a network (such as Internet) and ready to use (or be used by) other computers or devices.

2. Database, file, or webpage available for downloading or reading.

3. Services such as ticket reservation systems, or capability such as online help, available directly through a computer system or under its direct control.

OFFLINE

- Offline indicates a disconnected state.
- "Offline" can refer to either computing activities performed while disconnected from the Internet, or alternatives to Internet activities.
- The term "offline" is sometimes used interchangeably with the acronym "IRL", meaning "in real life".

INTERNET APPLICATIONS:

WWW

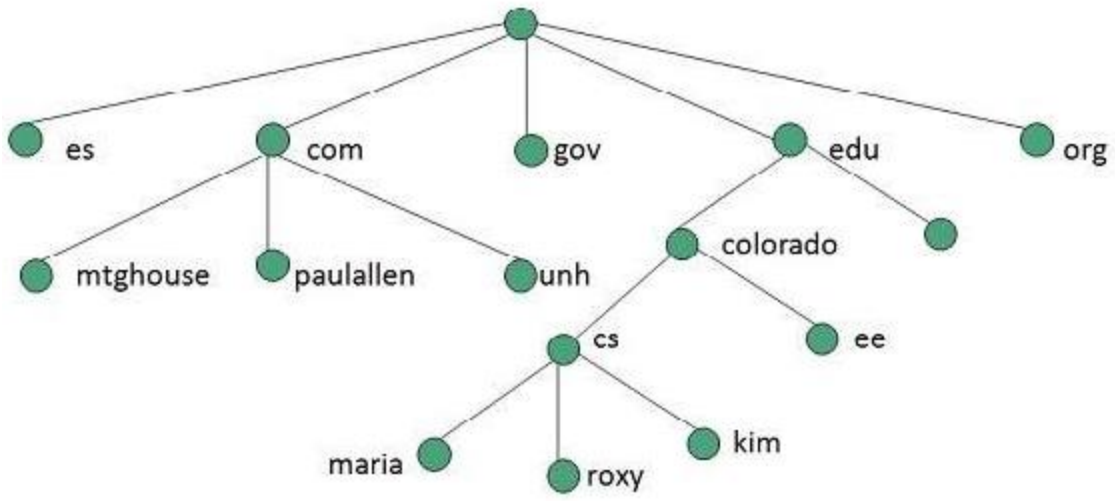
WWW stands for **World Wide Web.** A technical definition of the World Wide Web is : all the resources and users on the Internet that are using the Hypertext Transfer Protocol (HTTP).

A broader definition comes from the organization that Web inventor **Tim Berners-Lee** helped found, the **World Wide Web Consortium (W3C).**

The World Wide Web is the universe of network-accessible information, an embodiment of human knowledge.

In simple terms, The World Wide Web is a way of exchanging information between computers on the Internet, tying them together into a vast collection of interactive multimedia resources.

Internet and **Web** is not the same thing: Web uses internet to pass over the information.



Evolution

World Wide Web was created by **Timothy Berners Lee** in 1989 at **CERN** in **Geneva.** World Wide Web came into existence as a proposal by him, to allow researchers to work together effectively and efficiently at **CERN.** Eventually it became **World Wide Web.**

The following diagram briefly defines evolution of World Wide Web:

WWW Architecture

WWW architecture is divided into several layers as shown in the following diagram:

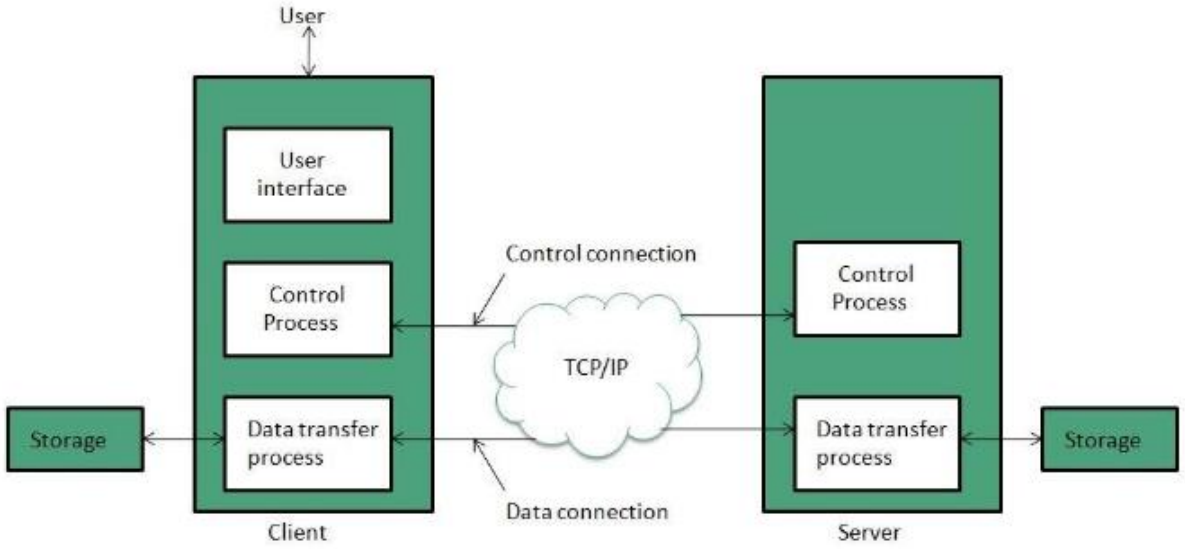
TELNET

Telnet is a protocol used to log in to remote computer on the internet. There are a number of Telnet clients having user friendly user interface. The following diagram shows a person is logged in to computer A, and from there, he remote logged into computer B.

FTP

FTP is used to copy files from one host to another. FTP offers the mechanism for the same in following manner:

- FTP creates two processes such as Control Process and Data Transfer Process at both ends i.e. at client as well as at server.
- FTP establishes two different connections: one is for data transfer and other is for control information.
- **Control connection** is made between **control processes** while **Data Connection** is made between<="" b="" style="box-sizing: border-box;">
- FTP uses **port 21** for the control connection and **Port 20** for the data connection.



E-MAIL

Definition

An email message is a text, typically brief and informal, that is sent or received over a computer network.

While email messages are usually simple text messages, attachments (such as image files and spreadsheets) can be included. An email message can be sent to multiple recipients at the same time.

Email stands for electronic mail. Similar to a letter, it is sent via the internet to a recipient. An email address is required to receive email and that address is unique to the user. People are using internet-based applications and some use programs on their computer to access and store emails.

Key benefits and feature of using email-

- Emails are easy to use. You can organize your daily correspondence, send & receive electronic messages.
- Emails are fast, no other form of written communication is as fast as an email. They are delivered at once around the world.

- Simple & formal languages used in email.
- We can use pictures & send birthday cards or newsletters through emails.

SOCIAL NETWORKS

Alternatively referred to as a virtual community or profile site, a social network is a website that brings people together to talk, share ideas and interests, or make new friends. This type of collaboration and sharing is known as social media. Unlike traditional media that is typically created by no more than ten people, social media sites contain content created by hundreds or even millions of different people.

Social networks help people keep connected with their friends and family and are an easy way to find what everyone is up to each day in your social circle. Social networks can also be used to find fun and interesting things on the Internet

Examples of social networks

1. Bebo (https://bebo.com/) - A popular social networking site where users can share photos, stories, their journal, and more with friends and family privately or publicly on the Internet.
2. Classmates (http://www.classmates.com/) - One of the largest and most used websites for connecting people who graduated from a high school and allows you to keep in touch with them and any future reunions.
3. Facebook (https://www.facebook.com/) - The most popular social networking websites on the Internet. Facebook is a popular destination for users to set up personal space and connect with friends, share pictures, share movies, talk about what you're doing, etc.
4. Google+ (https://plus.google.com/) - The latest social networking service from Google.
5. Instagram(https://www.instagram.com/) - A mobile photo sharing service and application available for the iPhone, Android, and Windows Phone platforms.
6. LinkedIn (https://www.linkedin.com/) - One of the best if not the best locations to connect with current and past coworkers and potentially future employers.

7. MySpace (https://myspace.com/) - Once one of the most popular social networks and viewed website on the Internet. See the MySpace definition for further information about this service.
8. Path (https://path.com/) - A mobile-only social network that allows you to keep in contact with your closest friends and family.
9. Pinterest(https://www.pinterest.com/) - A popular picture and sharing service that allows anyone to share pictures, create collections, and more.
10. Reddit(https://www.reddit.com/) - Community of registered users (redditors) submits content that is upvoted by the community. Reddit has a subreddit (board) for almost every category.
11. StumbleUpon(http://www.stumbleupon.com/) - Another very popular community of Internet users who vote for web pages they like and dislike. StumbleUpon also allows users to create personal pages of interesting sites they come across. See the StumbleUpon definition for additional information about this service.
12. Tumblr(https://www.tumblr.com/) - A microblogging platform with social networking capabilities.
13. Twitter (https://twitter.com/) - Another fantastic service that allows users to post 140 character long posts from their phones and on the Internet. A fantastic way to get the pulse of what's going on around the world.
14. Yik Yak - Smartphone social network that connects users who are in close to each other.
15. YouTube (https://www.youtube.com/) - An excellent network of users posting video blogs or vlogs and other fun and exciting videos.

SEARCH ENGINES

A **search engine** is a software program or script available through the Internetthat searches documents and files for keywords and returns the results of any files containing those keywords. Today, there are many different search engines available on the Internet, each with their own abilities and features. The first search engine ever developed is considered Archie, which was used to search for FTP files and the first text-based search engine is considered Veronica. Today, the

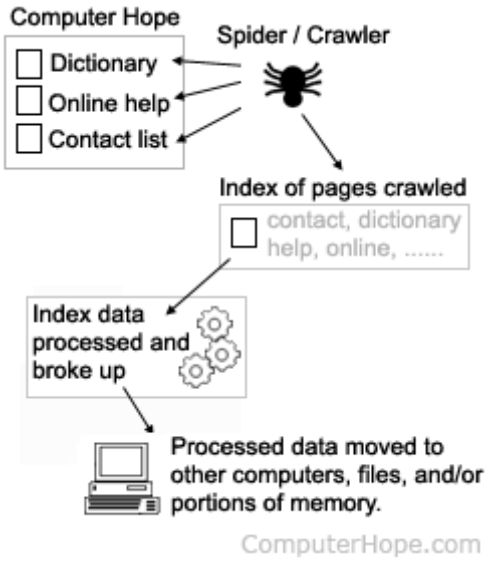
most popular and well-known search engine is Google. Other popular search engines include AOL, Ask.com, Baidu, Bing, and Yahoo.

How to access a search engine

For users, a search engine is accessed through a browser on their computer, smartphone, tablet, or another device. Today, most new browsers use an omnibox, which is a text box at the top of the browser that shows the address and is where you can also search on the Internet. You can also visit one of the major search engineshome page to perform a search.

How a search engine works

Because large search engines contain millions and sometimes billions of pages, many search engines not only just search the pages but also display the results depending on their importance. This importance is commonly determined by using various algorithms.



As illustrated in the image on the right, the source of all search engine data is a spider or crawler, which automatically visits pages and indexes their contents.

Once a page has been crawled, the data contained in the page is processed and indexed. Often, this can involve the steps below.

- Strip out stop words.

- Record the remaining words in the page and the frequency they occur.
- Record links to other pages.
- Record information about any images, audio, and embedded media on the page.

The data collected above is used to rank the page and is the primary method a search engine uses to determine if a page should be shown and in what order.

Finally, once the data is processed, it is broken up into one or more files, moved to different computers, or loaded into memory where it can be accessed when a search is performed.

What is the best search engine?

There isn't one search engine that is better than all the others. Some people could argue that Google's search engine is the best and it is probably the most popular and well known. Often, if someone asks how to do something, or what something is, another person will suggest they "Google it". "Google", used as a verb, means to search for results using the Google search engine.

Microsoft's Bing search engine is also popular and used by many people. Bing does an excellent job of finding information and answering questions. Yahoo's search engine, while not quite as popular as it used to be, still does an excellent job of searching for information.

VIDEO CONFERENCING

Video conferencing or Video teleconferencing is a method of communicating by two-way video and audio transmission with help of telecommunication technologies.

Videoconferencing (or video conference) means to conduct a conference between two or more participants at different sites by using computer networks to transmit audio and video data. For example, a point-to-point (two-person) video conferencing system works much like a video telephone. Each participant has a video camera, microphone, and speakers mounted on his or her computer. As the two participants speak to one another, their voices are carried over the network

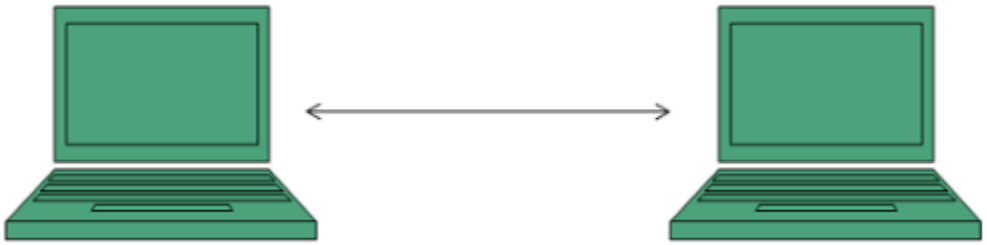
and delivered to the other's speakers, and whatever images appear in front of the video camera appear in a window on the other participant's monitor.

Multipoint videoconferencing allows three or more participants to sit in a virtual conference room and communicate as if they were sitting right next to each other.

Modes of Video Conferencing

POINT-TO-POINT

This mode of conferencing connects two locations only.



MULTI-POINT

This mode of conferencing connects more than two locations through **Multi-point Control Unit (MCU).**

E-COMMERCE

E-commerce is the use of electronic communication and digital information processing technology in business transactions to create, transform and redefine relationships for value creation between or among organisations and individuals.

It simply refers to the buying and selling of products, services and information via computer networks including internet.

E-commerce is concerned with system and business processes that support –

- creation of information sources
- movement of information over global networks
- effective and efficient interaction among producers, consumers, intermediaries and seller
- It utilizes electronic networks to implement daily economic activities such as pricing, payments, contracting, shipping and delivery.

Features of E commerce →

- Ubiquity – It is everywhere i.e. e-commerce is not restricted to a physical place.
- Global reach – It is possible to conduct business transactions worldwide.
- Universal Standards – E-commerce makes use of Internet and World Wide Web to reach customers which has the same technical standards worldwide.
- Richness – E-commerce provides rich content in form of interactive graphics, videos, animations etc.
- Interactive –A two way communication between business and customers is possible.
- Personalisation and customization – It allows for personalization and customization of products.
- Information density – E-commerce technologies provide useful and quality information thereby reducing information costs.

Driving forces behind E commerce

The Major Driving forces behind the growth of E-commerce are

- Global Customers – Presense of customers of a product worldwide.

- Global Products – Demand for foriegn products by customers.
- Global Operations – Development of Transnational and Multinational Corporations
- Global Resources – Use of foreign raw material, labour, machines for production
- Global Collaborations – Joint ventures, Mergers, Strategic Alliances
- Global Competition – Race to capture market share in developing countries

Factors Affecting E-commerce –

Key drivers of e-commerce may be categorized in terms of 4 key business environment factors which influence the e-commerce industry. They are

1. Technological Factors –

- State of telecommunication infrastructure
- Access to new technological developments
- Bandwidth availability and Internet rates

2. Political Factors –

- Number and type of government initiatives to support use and development of modern technology
- Discouraging rules and regulations of the government
- Ability of the government to to adapt and plan for technological growth and development

3. Social Factors –

- Literacy level of the people and penetration rate of PC`s
- Number of internet users
- Willingness and ability of the people to adopt new technology

4. Economic Factors –

- Economic growth of the country
- Average income of the people
- Cost of Hardware and Software

- Cost of access to telecom infrastructure
- Commercial Structure and Innovative

Advantages of E commerce

Advantages to business –

- Increased potential market share and global reach
- It is easy to expand market with minimal capital outlay
- It enables a business to procure material and services from other companies
- It shortens or even eliminates marketing distribution channels, making products cheaper and vendor's profit higher
- It enables customization of products
- Low cost advertising cost and entry barriers
- It allows lower inventories and other cost savings like cost of creating, processing, distributing, storing and retrieving paper based information
- No 24 hour time constraint
- It is easier to launch a new product online

Advantages to Consumers –

- It enables 24/7 access
- It saves time, money and effort
- It provides more choices i.e. wide range of products and services
- Price and Product comparisons are available online
- Improved buying experience and delivery processing
- It provides a global market place
- It enables personalization and customization of products and services
- Customer enjoy benefits of a competitive environment

A typical E-Commerce Model –

Marketing & Research	Online Surveys, Search Engines, Social Media, Private Browsers, Feedback forms, Planning and forecasting
Information Exchange	Banner Ads, Interactive Ads, Website, E-catalogue
Order Placement	Online order processing, Browsing, Customized orders
Payment & Delivery	Electronic payment system, online delivery, physical shipments and delivery processing
Customer Service	E-CRM, Telephone support, FAQ sheets, Online support, Live chat, After sale service

Business Applications of E commerce –

Real Estate	Online Banking
E-Tailing	Stock Trading
E- Procurement	Import & Export
Online diagnosis and Treatment	Hotels & Tourism
Online Education & Training	Advertising & Promotion

E-commerce Models –

E-commerce Models	Example

B2B – Business to Business	Oracle, Alibaba, Qualcomm
B2C – Business to Consumer	Intel, Dell, Snapdeal
C2C – Consumer to Consumer	OLX, Quikr, Ebay

M-COMMERCE

M Commerce can be defined as any electronic commerce activity conducted over a wireless network through mobile devices. It includes activities such as buying and selling of goods, provision of services and information, online transactions etc.

Wireless networks like GSM, CDMA, TDMA, GPRS and UMTS enables a user of a mobile device to access a variety of information stored on databases of connectivity providers, information providers, service providers and web servers.

Mobile devices refer to devices that connect to a wireless network and are capable of accessing, interacting and displaying information on screen eg. –

- Cellular phones or Smart phones
- Pager devices
- Handheld computers, palmtops, tablets
- Laptop
- Personal digital Assistants (PDA)

The main idea behind M commerce is to enable various applications and services available on the internet to portable devices (mobile phones, tablets, laptops etc.) to overcome the constraints of a desktop computer. M commerce aims to serve all information and material needs of the people in a convenient and easy way.

Applications of M commerce

- Mobile connect time communications
- Mobile equipment and device providers
- Value added services
- Mobile application developers
- Mobile commerce application providers
- Mobile Shopping
- Mobile advertising
- Mobile auctions
- Mobile entertainment
- Mobile financial services
- Location and search service

Advantages of M commerce

- It provides a convenient, secure and easy to use communication and distribution network
- It provides a wider reach as most people use cell phones
- It enables a business to target customers effectively e.g. on the basis of location, service provider, devices etc.
- It reduces transaction and order processing cost
- It encourages competitive pricing
- It streamlines all business processes

Disadvantages of M commerce

- Low acceptance rate of new devices, applications and technology among people
- Lack of supporting infrastructure, professionals and technology in developing countries
- Security and privacy issues
- Expensive 2G, 3G plans
- Customer retention rate is very low

VOIP

VoIP (voice over IP) is the transmission of voice and multimedia content over Internet Protocol (IP) networks. VoIP historically referred to using IP to connect private branch exchanges (PBXs), but the term is now used interchangeably with IP telephony.

VoIP is enabled by a group of technologies and methodologies used to deliver voice communications over the internet, enterprise local area networks or wide area networks. VoIP endpoints include dedicated desktop VoIP phones, softphone applications running on PCs and mobile devices, and WebRTC-enabled browsers.

How does VoIP work?

VoIP uses codecs to encapsulate audio into data packets, transmit the packets across an IP network and unencapsulate the packets back into audio at the other end of the connection. By eliminating the use of circuit-switched networks for voice, VoIP reduces network infrastructure costs, enables providers to deliver voice services over their broadband and private networks, and allows enterprises to operate a single voice and data network.

VoIP telephones

The two main types of VoIP telephones are hardware-based and software-based.

A hardware-based VoIP phone looks like a traditional hard-wired or cordless telephone and includes similar features, such as a speaker or microphone, a touchpad, and a caller ID display. VoIP phones can also provide voicemail, call conferencing and call transfer.

Software-based IP phones, also known as softphones, are software clients installed on a computer or mobile device. The softphone user interface often looks like a telephone handset with a touchpad and caller ID display. A headset equipped with a microphone connects to the computer or mobile device to make calls. Users can also make calls via their computer or mobile device if they have a built-in microphone and speaker.

BLOGS

A blog (shortening of "weblog") is an online journal or informational website displaying information in the reverse chronological order, with latest posts appearing first. It is a platform where a writer or even a group of writers share their views on an individual subject.

Blog structure

The appearance of blogs changed over time, and nowadays blogs include different items. But, most blogs include some standard features and structure. Here are common features that a typical blog will include:

- Header with the menu or navigation bar
- Main content area with highlighted or latest blog posts
- Sidebar with social profiles, favorite content, or call-to-action
- Footer with relevant links like a disclaimer, privacy policy, contact page, etc.

CLASS: I B.Sc IT COURSE CODE: 18ITU203 BATCH-2018-2021
COURSE NAME: COMPUTER NETWORKS AND INTERNET TECHNOLOGIES
UNIT: III (Internet Terms and Application)

POSSIBLE QUESTIONS

Part B (2 Marks)

1. Define Web page
2. What is called a browser?
3. How to download and upload?
4. Compare online and offline.
5. What is meant by URL?
6. Write syntax of URL and explain.

Part C (6 Marks)

1. Explicate on different types of website.
2. Explain: (i) Telnet (ii) FTP
3. What is use of social networks and explain its types.
4. Discuss on Video Conferencing,
5. Explain about e-Commerce, m-Commerce.

UNIT-IV

Introduction to Web Design: Introduction to hypertext markup language (html) Document type definition, creating web pages, lists, hyperlinks, tables, web forms, inserting images, frames, hosting options and domain name registration. **Customized Features:** Cascading style sheet (css) for text formatting and other manipulations.

What is an html File?

HTML stands for Hypertext Markup Language, and it is the most widely used language to write Web Pages.

• Hypertext refers to the way in which Web pages (HTML documents) are linked together. Thus, the link available on a webpage is called Hypertext.

• As its name suggests, HTML is a Markup Language which means you use HTML to simply "mark-up" a text document with tags that tell a Web browser how to structure it to display.

Originally, HTML was developed with the intent of defining the structure of documents like headings, paragraphs, lists, and so forth to facilitate the sharing of scientific information between researchers.

Now, HTML is being widely used to format web pages with the help of different tags available in HTML language.

Basic HTML Document

In its simplest form, following is an example of an HTML document:

```
<!DOCTYPE html>
<html>
<head>
<title>This is document title</title>
</head>
<body>
```

<h1>This is a heading</h1>
Document content goes here.....
</body>
</html>

HTML Tags

As told earlier, HTML is a markup language and makes use of various tags to format the content. These tags are enclosed within angle braces **<Tag Name>**. Except few tags, most of the tags have their corresponding closing tags. For example, **<html>**has its closing tag**</html>**and **<body>**tag has its closing tag **</body>**tag etc.

Above example of HTML document uses the following tags:

Tag	Description
<!DOCTYPE...>	This tag defines the document type and HTML version.
<html>	ThistagenclosesthecompleteHTMLdocumentandmainlycomprises of document header which is represented by <head>...</head> and document body which is represented by <body>...</body>tags.
<head>	Thistagrepresentsthedocument'sheaderwhichcankeepotherHTML tags like <title>, <link>etc.
<title>	The <title> tag is used inside the <head> tag to mention the document title.
<body>	Thistagrepresentsthedocument'sbodywhichkeepsotherHTMLtags like <h1>, , etc.
<h1>	This tag represents the heading.

<p>	This tag represents a paragraph.

HTML Document Structure

A typical HTML document will have the following structure:

```
Document declaration tag
<html>
    <head>
        Document header related tags
    </head>

    <body>
        Document body related tags
    </body>
</html>
```

We will study all the header and body tags in subsequent chapters, but for now let's see what is document declaration tag.

The <!DOCTYPE> Declaration

The <!DOCTYPE> declaration tag is used by the web browser to understand the version of the HTML used in the document. Current version of HTML is 5 and it makes use of the following declaration:

```
<!DOCTYPE html>
```

There are many other declaration types which can be used in HTML document depending on what version of HTML is being used. We will see more details on this whilediscussing
<!DOCTYPE...> tag along with other HTML tags.

Create Your Own Test Web

If you just want to learn HTML, skip the rest of this chapter.

If you want to create a test page on your own computer, just copy the 3 files below to your desktop.

(Right click on each link, and select "save target as" or "save link as")

mainpage.htm

page1.htm

page2.htm

After you have copied the files, you can double-click on the file called "mainpage.htm" and see your first web site in action.

.HTM or .HTML File Extension?

When you save an HTML file, you can use either the .htm or the .html file extension. We use .htm in our examples. It is a habit from the past, when the software only allowed three letters in file extensions.

With new software it is perfectly safe to use .html.

Don't worry if the examples use tags you have not learned.

You will learn about them in the next chapters.

HTML – LISTS

HTML offers web authors three ways for specifying lists of information. All lists must contain one or more list elements. Lists may contain:

 <ul>- An unordered list. This will list items using plain bullets.

 <ol>- An ordered list. This will use different schemes of numbers to list your items.

 <dl>- A definition list. This arranges your items in the same way as they are arranged in a dictionary.

HTML Unordered Lists

An unordered list is a collection of related items that have no special order or sequence. This list is created by using HTML **<ul>**tag. Each item in the list is marked with a bullet.

Example

```
<!DOCTYPE html>
<html>
<head>
<title>HTML Unordered List</title>
</head>
<body>
<ul>
<li>Beetroot</li>
<li>Ginger</li>
<li>Potato</li>
<li>Radish</li>
</ul>
</body>
</html>
```

This will produce the following result:

- Beetroot
- Ginger
- Potato
- Radish

The type Attribute

You can use **type** attribute for <ul> tag to specify the type of bullet you like. By default, it is a disc.

Following are the possible options:

<ul type="square">

<ul type="disc">

<ul type="circle">

Example

Following is an example where we used <ul type="square">

```
<!DOCTYPE html>
<html>
<head>
<title>HTML Unordered List</title>
</head>
<body>
<ul type="square">
<li>Beetroot</li>
<li>Ginger</li>
<li>Potato</li>
<li>Radish</li>
</ul>
</body>
</html>
```

This will produce the following result:

 Beetroot

 Ginger

 Potato

 Radish

Example

Following is an example where we used <ul type="disc">:

```
<!DOCTYPE html>
<html>
<head>
<title>HTML Unordered List</title>
</head>
<body>
<ul type="disc">
<li>Beetroot</li>
<li>Ginger</li>
<li>Potato</li>
<li>Radish</li>
</ul>
</body>
</html>
```

This will produce the following result:

 Beetroot

 Ginger

 Potato

 Radish

Example

Following is an example where we used <ul type="circle">:

```
<!DOCTYPE html>
<html>
<head>
<title>HTML Unordered List</title>
</head>
<body>
<ul type="circle">
<li>Beetroot</li>
<li>Ginger</li>
<li>Potato</li>
<li>Radish</li>
</ul>
</body>
</html>
```

This will produce the following result:

- Beetroot
- Ginger
- Potato
- Radish

HTML Ordered Lists

If you are required to put your items in a numbered list instead of bulleted, then HTML ordered list will be used. This list is created by using **<ol>**tag. The numbering starts at one and is incremented by one for each successive ordered list element tagged with <li>.

Example

```
<!DOCTYPE html>
<html>
<head>
```

```
<title>HTML Ordered List</title>
</head>
<body>
<ol>
<li>Beetroot</li>
<li>Ginger</li>
<li>Potato</li>
<li>Radish</li>
</ol>
</body>
</html>
```

This will produce the following result:

1. Beetroot
2. Ginger
3. Potato
4. Radish

The type Attribute

You can use **type** attribute for <ol> tag to specify the type of numbering you like. By default, it is a number. Following are the possible options:

<ol type="1"> - Default-Case Numerals.

<ol type="I"> - Upper-Case Numerals.

<ol type="i"> - Lower-Case Numerals.

<ol type="a"> - Lower-Case Letters.

<ol type="A"> - Upper-Case Letters.

Example

Following is an example where we used <ol type="1">

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

```
<head>
<title>HTML Ordered List</title>
</head>
<body>
<ol type="1">
<li>Beetroot</li>
<li>Ginger</li>
<li>Potato</li>
<li>Radish</li>
</ol>
</body>
</html>
```

This will produce the following result:

1. Beetroot
2. Ginger
3. Potato
4. Radish

Example

Following is an example where we used <ol type="I">

```
<!DOCTYPE html>
<html>
<head>
<title>HTML Ordered List</title>
</head>
<body>
<ol type="I">
<li>Beetroot</li>
<li>Ginger</li>
```

```
<li>Potato</li>
<li>Radish</li>
</ol>
</body>
</html>
```

This will produce the following result:

I. Beetroot

II. Ginger

III. Potato

IV. Radish

Example

Following is an example where we used <ol type="i">

```
<!DOCTYPE html>
<html>
<head>
<title>HTML Ordered List</title>
</head>
<body>
<ol type="i">
<li>Beetroot</li>
<li>Ginger</li>
<li>Potato</li>
<li>Radish</li>
</ol>
</body>
</html>
```

This will produce the following result:

i. Beetroot

ii. Ginger

iii. Potato

iv. Radish

Example

Following is an example where we used <ol type="A">

```
<!DOCTYPE html>
<html>
<head>
<title>HTML Ordered List</title>
</head>
<body>
<ol type="A">
<li>Beetroot</li>
<li>Ginger</li>
<li>Potato</li>
<li>Radish</li>
</ol>
</body>
</html>
```

This will produce the following result:

A. Beetroot

B. Ginger

C. Potato

D. Radish

Example

Following is an example where we used <ol type="a">

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

```
<head>
<title>HTML Ordered List</title>
</head>
<body>
<ol type="a">
<li>Beetroot</li>
<li>Ginger</li>
<li>Potato</li>
<li>Radish</li>
</ol>
</body>
</html>
```

This will produce the following result:

a. Beetroot

b. Ginger

c. Potato

d. Radish

HTML Definition Lists

HTML and XHTML supports a list style which is called **definition lists** where entries are listed like in a dictionary or encyclopedia. The definition list is the ideal way to present a glossary, list of terms, or other name/value list.

Definition List makes use of following three tags.

- <dl> - Defines the start of the list
- <dt> - A term
- <dd> - Term definition
- </dl> - Defines the end of the list

Example

```
<!DOCTYPE html>
```

```
<html>
<head>
<title>HTML Definition List</title>
</head>
<body>
<dl>
<dt><b>HTML</b></dt>
<dd>This stands for Hyper Text Markup Language</dd>
<dt><b>HTTP</b></dt>
<dd>This stands for Hyper Text Transfer Protocol</dd>
</dl>
</body>
</html>
```

This will produce the following result:

HTML

This stands for Hyper Text Markup Language

HTTP

This stands for Hyper Text Transfer Protocol

HTML hyperlinks

A webpage can contain various links that take you directly to other pages and even specific parts of a given page. These links are known as hyperlinks.

Hyperlinks allow visitors to navigate between Web sites by clicking on words, phrases, and images. Thus you can create hyperlinks using text or images available on a webpage.

- Use the **<a>** element to define a link
- Use the **href** attribute to define the link address
- Use the **target** attribute to define where to open the linked document
- Use the **<img>** element (inside <a>) to use an image as a link

- Use the **id** attribute (id="*value*") to define bookmarks in a page
- Use the **href** attribute (href="#*value*") to link to the bookmark

Linking Documents

A link is specified using HTML tag <a>. This tag is called **anchor tag** and anything between the opening <a> tag and the closing tag becomes part of the link and a user can click that part to reach to the linked document. Following is the simple syntax to use <a> tag.

```
<a href = "Document URL" ... attributes-list>Link Text</a>
```

Example

```
<html>
<head>
<title>Hyperlink Example</title>
</head>
<body>
<p>Click following link</p>
<a href = "https://www.tutorialspoint.com">Tutorials Point</a>
</body>
</html>
```

The target Attribute

We have used target attribute in our previous example. This attribute is used to specify the location where linked document is opened. Following are the possible options −

Sr.No	Option	Description
1	_blank	Opens the linked document in a new window or tab.
2	_self	Opens the linked document in the same frame.

3	_parent	Opens the linked document in the parent frame.
4	_top	Opens the linked document in the full body of the window.
5	targetframe	Opens the linked document in a named targetframe.

Example

Try following example to understand basic difference in few options given for target attribute.

```
<html>
<head>
<title>Hyperlink Example</title>
<base href = "https://www.tutorialspoint.com/">
</head>
<body>
<p>Click any of the following links</p>
<a href = "/html/index.htm" target = "_blank">Opens in New</a> |
<a href = "/html/index.htm" target = "_self">Opens in Self</a> |
<a href = "/html/index.htm" target = "_parent">Opens in Parent</a> |
<a href = "/html/index.htm" target = "_top">Opens in Body</a>
</body>
</html>
```

HTML Links - Create a Bookmark

HTML bookmarks are used to allow readers to jump to specific parts of a Web page.

Bookmarks can be useful if your webpage is very long.

To make a bookmark, you must first create the bookmark, and then add a link to it.

When the link is clicked, the page will scroll to the location with the bookmark.

Example

First, create a bookmark with the id attribute:

```
<h2 id="C4">Chapter 4</h2>
```

Then, add a link to the bookmark ("Jump to Chapter 4"), from within the same page:

```
<a href="#C4">Jump to Chapter 4</a>
```

Or, add a link to the bookmark ("Jump to Chapter 4"), from another page:

Example

```
<a href="html_demo.html#C4">Jump to Chapter 4</a>
```

```
<!DOCTYPE html>
<html>
<body>
<p><a href="#C4">Jump to Chapter 4</a></p>
<h2>Chapter 1</h2>
<p>This chapter explains bablabla</p>
<h2>Chapter 2</h2>
<p>This chapter explains bablabla</p>
<h2>Chapter 3</h2>
<p>This chapter explains bablabla</p>
<h2 id="C4">Chapter 4</h2>
<p>This chapter explains bablabla</p>
<h2>Chapter 5</h2>
<p>This chapter explains bablabla</p>
<h2>Chapter 6</h2>
<p>This chapter explains bablabla</p>
<h2>Chapter 7</h2>
<p>This chapter explains bablabla</p>
<h2>Chapter 8</h2>
```

```
<p>This chapter explains bablabla</p>
<h2>Chapter 9</h2>
<p>This chapter explains bablabla</p>
<h2>Chapter 10</h2>
<p>This chapter explains bablabla</p>
<h2>Chapter 11</h2>
<p>This chapter explains bablabla</p>
<h2>Chapter 12</h2>
<p>This chapter explains bablabla</p>
<h2>Chapter 13</h2>
<p>This chapter explains bablabla</p>
<h2>Chapter 14</h2>
<p>This chapter explains bablabla</p>
<h2>Chapter 15</h2>
<p>This chapter explains bablabla</p>
<h2>Chapter 16</h2>
<p>This chapter explains bablabla</p>
<h2>Chapter 17</h2>
<p>This chapter explains bablabla</p>
</body>
</html>
```

Linking to a Page Section

You can create a link to a particular section of a given webpage by using **name** attribute. This is a two-step process.

Note −The *name* attribute deprecated in HTML5. Do not use this attribute. Use *id* and *title* attribute instead.

First create a link to the place where you want to reach with-in a webpage and name it using <a...> tag as follows −

```
<h1>HTML Text Links <a name = "top"></a></h1>
```

Second step is to create a hyperlink to link the document and place where you want to reach −

```
<a href = "/html/html_text_links.htm#top">Go to the Top</a>
```

This will produce following link, where you can click on the link generated **Go to the Top** to reach to the top of the HTML Text Link tutorial.

Go to the Top

Local Links

The example above used an absolute URL (A full web address).

A local link (link to the same web site) is specified with a relative URL (without http://www....).

Example

```
<a href="html_images.asp">HTML Images</a>
```

HTML Link Colors

By default, a link will appear like this (in all browsers):

- An unvisited link is underlined and blue
- A visited link is underlined and purple
- An active link is underlined and red

You can change the default colors, by using styles:

Example

```
<style>
a:link {
  color: green;
  background-color: transparent;
  text-decoration: none;
}
```

```
a:visited {
   color: pink;
   background-color: transparent;
   text-decoration: none;
}
a:hover {
   color: red;
   background-color: transparent;
   text-decoration: underline;
}
a:active {
   color: yellow;
   background-color: transparent;
   text-decoration: underline;
}
</style>
</head>
<body>
<p>You can change the default colors of links</p>
<a href="html_images.asp" target="_blank">HTML Images</a>
</body>
</html>
```

Setting Link Colors

You can set colors of your links, active links and visited links using **link**, **alink** and **vlink** attributes of <body> tag

Example

Save the following in test.htm and open it in any web browser to see how link, alink and vlinkattributes work.

```
<html>
<head>
<title>Hyperlink Example</title>
<base href = "https://www.tutorialspoint.com/">
</head>
<body alink = "#54A250" link = "#040404" vlink = "#F40633">
<p>Click following link</p>
<a href = "/html/index.htm" target = "_blank" >HTML Tutorial</a>
</body>
</html>
```

This will produce the following result. Just check color of the link before clicking on it, next check its color when you activate it and when the link has been visited.

Click following link

The HTML tables allow web authors to arrange data like text, images, links, other tables, etc. into rows and columns of cells.

The HTML tables are created using the **<table>**tag in which the **<tr>**tag is used to create table rows and **<td>**tag is used to create data cells.

Example

```
<!DOCTYPE html>
<html>
<head>
<title>HTML Tables</title>
</head>
<body>
```

```
<table border="1">
<tr>
<td>Row 1, Column 1</td>
<td>Row 1, Column 2</td>
</tr>
<tr>
<td>Row 2, Column 1</td>
<td>Row 2, Column 2</td>
</tr>
</table>
</body>
</html>
```

This will produce the following result:

Row 1, Column 1 Row 1, Column 2

Row 2, Column 1 Row 2, Column 2

Table Heading

Table heading can be defined using **<th>**tag. This tag will be put to replace <td> tag, which is used to represent actual data cell. Normally you will put your top row as table heading as shown below, otherwise you can use <th> element in any row.

Example

```
<!DOCTYPE html>
<html>
<head>
<title>HTML Table Header</title>
</head>
<body>
<table border="1">
<tr>
<th>Name</th>
<th>Salary</th>
</tr>
<tr>
<td>Ramesh Raman</td>
<td>5000</td>
</tr>
<tr>
<td>Shabbir Hussein</td>
<td>7000</td>
```

```
</tr>

</table>

</body>

</html>
```

This will produce the following result:

Name	Salary
Ramesh Raman	5000
Shabbir Hussein	7000

Cellpadding and Cellspacing Attributes

There are two attributes called *cellpadding* and *cellspacing* which you will use to adjust the white space in your table cells. The cellspacing attribute defines the width of the border, while cellpadding represents the distance between cell borders and the content within a cell.

Example

```
<!DOCTYPE html>

<html>

<head>

<title>HTML Table Cellpadding</title>

</head>

<body>
```

```
<table border="1" cellpadding="5" cellspacing="5">
<tr>
<th>Name</th>
<th>Salary</th>
</tr>
<tr>
<td>Ramesh Raman</td>
<td>5000</td>
</tr>
<tr>
<td>Shabbir Hussein</td>
<td>7000</td>
</tr>
</table>
</body>
</html>
```

This will produce the following result:

Name	Salary
Ramesh Raman	5000

Shabbir Hussein 7000

Colspan and Rowspan Attributes

You will use **colspan**attribute if you want to merge two or more columns into a single column. Similar way you will use **rowspan**if you want to merge two or more rows.

Example

```
<!DOCTYPE html>
<html>
<head>
<title>HTML Table Colspan/Rowspan</title>
</head>
<body>
<table border="1">
<tr>
<th>Column 1</th>
<th>Column 2</th>
<th>Column 3</th>
</tr>
<tr><td rowspan="2">Row 1 Cell 1</td><td>Row 1 Cell 2</td><td>Row 1 Cell 3</td></tr>
```

```
<tr><td>Row 2 Cell 2</td><td>Row 2 Cell 3</td></tr>

<tr><td colspan="3">Row 3 Cell 1</td></tr>

</table>

</body>

</html>
```

This will produce the following result:

Column 1	Column 2	Column 3
Row 1 Cell 1	Row 1 Cell 2	Row 1 Cell 3
	Row 2 Cell 2	Row 2 Cell 3
Row 3 Cell 1		

Tables Backgrounds

You can set table background using one of the following two ways:

- bgcolor attribute - You can set background color for whole table or just for one cell.
- backgroundattribute - You can set background image for whole table or just for one cell.

You can also set border color also using **bordercolor**attribute.

Example

```
<!DOCTYPE html>
```

```
<html>
<head>
<title>HTML Table Background</title>
</head>
<body>
<table border="1" bordercolor="green" bgcolor="yellow">
<tr>
<th>Column 1</th>
<th>Column 2</th>
<th>Column 3</th>
</tr>
<tr><td rowspan="2">Row 1 Cell 1</td><td>Row 1 Cell 2</td><td>Row 1 Cell 3</td></tr>
<tr><td>Row 2 Cell 2</td><td>Row 2 Cell 3</td></tr>
<tr><td colspan="3">Row 3 Cell 1</td></tr>
</table>
</body>
</html>
```

This will produce the following result:

Column 1	Column 2	Column 3
Row 1 Cell 1	Row 1 Cell 2	Row 1 Cell 3
	Row 2 Cell 2	Row 2 Cell 3
Row 3 Cell 1		

Html Images

HTML The <img> Tag and the Src Attribute

In HTML, images are defined with the <img> tag.

The <img> tag is empty, which means that it contains attributes only, and has no closing tag.

To display an image on a page, you need to use the src attribute. Src stands for "source". The value of the src attribute is the URL of the image you want to display.

Syntax for defining an image:

<imgsrc="*url*" alt="*some_text*"/>

The URL points to the location where the image is stored. An image named "boat.gif", located in the "images" directory on "www.w3schools.com" has the URL: http://www.w3schools.com/images/boat.gif.

The browser displays the image where the <img> tag occurs in the document. If you put an image tag between two paragraphs, the browser shows the first paragraph, then the image, and then the second paragraph.

HTML The Alt Attribute

The required alt attribute specifies an alternate text for an image, if the image cannot be displayed.

The value of the alt attribute is an author-defined text:

<imgsrc="boat.gif" alt="Big Boat" />

The alt attribute provides alternative information for an image if a user for some reason cannot view it

HTML Image Tags

Tag	Description
<img />	Defines an image
<map>	Defines an image-map
<area />	Defines a clickable area inside an image-map

HTML Frames

With frames, you can display more than one HTML document in the same browser window. Each HTML document is called a frame, and each frame is independent of the others.

The disadvantages of using frames are:

- The web developer must keep track of more HTML documents
- It is difficult to print the entire page

The HTML frameset Element

The frameset element holds one or more frame elements. Each frame element can hold a separate document.

The frameset element states HOW MANY columns or rows there will be in the frameset, and HOW MUCH percentage/pixels of space will occupy each of them.

The HTML frame Element

The <frame> tag defines one particular window (frame) within a frameset.

In the example below we have a frameset with two columns.

The first column is set to 25% of the width of the browser window. The second column is set to 75% of the width of the browser window. The document "frame_a.htm" is put into the first column, and the document "frame_b.htm" is put into the second column:

```
<frameset cols="25%,75%">
  <frame src="frame_a.htm" />
  <frame src="frame_b.htm" />
</frameset>
```

The frameset column size can also be set in pixels (cols="200,500"), and one of the columns can be set to use the remaining space, with an asterisk (cols="25%,*").

HTML Frame Tags

Tag	Description
<frameset>	Defines a set of frames
<frame />	Defines a sub window (a frame)
<noframes>	Defines a noframe section for browsers that do not handle frames
<iframe>	Defines an inline sub window (frame)

Hosting options and domain name registration

A domain is the name of your website and it's made of 2 things:
Aname: *what-ever-you-want-to-name-your-website.*
A top level domain: .com, .org, .net, etc.

There are many types of domains, starting with the original top level domains(including .com, .org, .net, .edu), country top level domains(like .us, .fr, .ca, .cl, .ar, .co, .tv, .io, .in, etc.), second level domains (.co.uk, .com.ar, etc.) and other types of domains. There is a new list of domain names you can also check

(examples: .nyc, .miami, .bike). In most cases, this ones are sold by specific domain name registrars. A full list of domains is maintained by the Internet Assigned Numbers Authority.

Domain names can be bought (we talk about buying domains but you actually rent them) for one year and renewed annually from Domain Name Registrars. You can also choose to buy your domain for more years. You can buy a domain and pay for web hosting from a single provider or get the web hosting elsewhere. Due to the specificity of each service, it's more usual to get the domain and hosting separately.

Once you register a domain name, you will get one or more Domain Name Servers (DNS). DNS "are the Internet's equivalent of a phone book. They maintain a directory of domain names and translate them to Internet Protocol (IP) addresses". This may look like host1.domainnameregistrar.com which is the text on top of the underlying IP address.

Depending on popularity and availability, prices of domains vary. A .com domain can cost $10 dollars per year, while a .io (very popular in *startupland*lately) will cost $50. Prices may vary also between domain name registrars, if they are on sale, etc.

Things to look for when you buy a domain name from a domain registrar:

- FTP access
- Includes cPanel (a dashboard to manage your domain and DNS)
- Full control of your DNS

Cascading style sheet

What is CSS?

- CSS stands for Cascading Style Sheets
- Styles define how to display HTML elements
- Styles were added to HTML 4.0 to solve a problem
- External Style Sheets can save a lot of work
- External Style Sheets are stored in CSS files

A style sheet is made up of style rules that tell a browser how to present a document. There are various ways of linking these style rules to your HTML documents, but the simplest method for starting out is to use HTML'sSTYLE element. This element is placed in the documentHEAD, and it contains the style rules for the page.

Note that while the STYLE element is a good method of experimenting with style sheets, it has disadvantages that should be considered before one uses this method in practice. The advantages and disadvantages of the various methods are discussed in the section on linking style sheets to HTML.

Each rule is made up of a selector--usually an HTML element such as BODY, P, or EM--and the style to be applied to the selector.

There are numerous properties that may be defined for an element. Each property takes a value, which together with the property describes how the selector should be presented.

Style rules are formed as follows:

selector { property: value }

Multiple style declarations for a single selector may be separated by a semicolon:

selector { property1: value1; property2: value2 }

As an example, the following code segment defines the color and font-size properties for H1 and H2 elements:

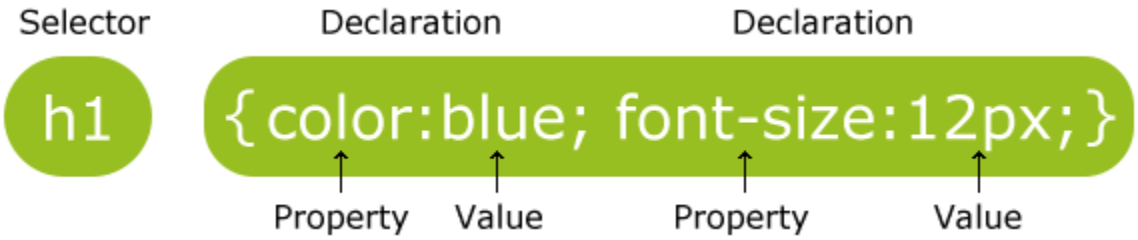
```
<HEAD>
<TITLE>CSS Example</TITLE>
<STYLE TYPE="text/css">
  H1 { font-size: x-large; color: red }
  H2 { font-size: large; color: blue }
</STYLE>
</HEAD>
```

The above style sheet tells the browser to show level-one headings in an extra-large, red font, and to show level-two headings in a large, blue font. The CSS1 Specification formally defines all

properties and values available. The properties and values are also given in the CSS Properties section of this site.

CSS Syntax

A CSS rule has two main parts: a selector, and one or more declarations:



The selector is normally the HTML element you want to style.

Each declaration consists of a property and a value.

The property is the style attribute you want to change. Each property has a value.

CSS Example

CSS declarations always ends with a semicolon, and declaration groups are surrounded by curly brackets:

```
p {color:red;text-align:center;}
```

To make the CSS more readable, you can put one declaration on each line, like this:

Example

```
p
{
color:red;
text-align:center;
}
```

The id Selector

The id selector is used to specify a style for a single, unique element.

The id selector uses the id attribute of the HTML element, and is defined with a "#".

The style rule below will be applied to the element with id="para1":

Example

```
#para1
{
text-align:center;
color:red;
}
```

The class Selector

The class selector is used to specify a style for a group of elements. Unlike the id selector, the class selector is most often used on several elements.

This allows you to set a particular style for any HTML elements with the same class.

The class selector uses the HTML class attribute, and is defined with a "."

In the example below, all HTML elements with class="center" will be center-aligned:

Example

```
.center {text-align:center;}
```

Three Ways to Insert CSS

There are three ways of inserting a style sheet:

- External style sheet
- Internal style sheet
- Inline style

External Style Sheet

An external style sheet is ideal when the style is applied to many pages. With an external style sheet, you can change the look of an entire Web site by changing one file. Each page must link to the style sheet using the <link> tag. The <link> tag goes inside the head section:

```
<head>
<link rel="stylesheet" type="text/css" href="mystyle.css" />
</head>
```

An external style sheet can be written in any text editor. The file should not contain any html tags. Your style sheet should be saved with a .css extension. An example of a style sheet file is shown below:

```
hr {color:sienna;}
p {margin-left:20px;}
body {background-image:url("images/back40.gif");}
```

Do not leave spaces between the property value and the units! "margin-left:20 px" (instead of "margin-left:20px") will work in IE, but not in Firefox or Opera.

Internal Style Sheet

An internal style sheet should be used when a single document has a unique style. You define internal styles in the head section of an HTML page, by using the <style> tag, like this:

```
<head>
<style type="text/css">
hr {color:sienna;}
p {margin-left:20px;}
body {background-image:url("images/back40.gif");}
</style>
</head>
```

Inline Styles

An inline style loses many of the advantages of style sheets by mixing content with presentation. Use this method sparingly!

To use inline styles you use the style attribute in the relevant tag. The style attribute can contain any CSS property. The example shows how to change the color and the left margin of a paragraph:

```
<p style="color:sienna;margin-left:20px">This is a paragraph.</p>
```

Multiple Style Sheets

If some properties have been set for the same selector in different style sheets, the values will be inherited from the more specific style sheet.

For example, an external style sheet has these properties for the h3 selector:

```
h3
{
color:red;
text-align:left;
font-size:8pt;
}
```

And an internal style sheet has these properties for the h3 selector:

```
h3
{
text-align:right;
font-size:20pt;
}
```

If the page with the internal style sheet also links to the external style sheet the properties for h3 will be:

```
color:red;
text-align:right;
font-size:20pt;
```

The color is inherited from the external style sheet and the text-alignment and the font-size is replaced by the internal style sheet.

Multiple Styles Will Cascade into One

Styles can be specified:

- inside an HTML element
- inside the head section of an HTML page
- in an external CSS file

Tip: Even multiple external style sheets can be referenced inside a single HTML document.

Cascading order

What style will be used when there is more than one style specified for an HTML element?

Generally speaking we can say that all the styles will "cascade" into a new "virtual" style sheet by the following rules, where number four has the highest priority:

1. Browser default
2. External style sheet
3. Internal style sheet (in the head section)
4. Inline style (inside an HTML element)

So, an inline style (inside an HTML element) has the highest priority, which means that it will override a style defined inside the <head> tag, or in an external style sheet, or in a browser (a default value).

CSS Text

Text Color

The color property is used to set the color of the text. The color can be specified by:

- name - a color name, like "red"
- RGB - an RGB value, like "rgb(255,0,0)"
- Hex - a hex value, like "#ff0000"

The default color for a page is defined in the body selector.

Example

```
body {color:blue;}
h1 {color:#00ff00;}
h2 {color:rgb(255,0,0);}
```

Text Alignment

The text-align property is used to set the horizontal alignment of a text.

Text can be centered, or aligned to the left or right, or justified.

When text-align is set to "justify", each line is stretched so that every line has equal width, and the left and right margins are straight (like in magazines and newspapers).

Example

```
h1 {text-align:center;}
p.date {text-align:right;}
p.main {text-align:justify;}
```

Text Decoration

The text-decoration property is used to set or remove decorations from text.

The text-decoration property is mostly used to remove underlines from links for design purposes:

Example

```
a {text-decoration:none;}
```

It can also be used to decorate text:

Example

```
h1 {text-decoration:overline;}
h2 {text-decoration:line-through;}
h3 {text-decoration:underline;}
h4 {text-decoration:blink;}
```

Text Transformation

The text-transform property is used to specify uppercase and lowercase letters in a text.

It can be used to turn everything into uppercase or lowercase letters, or capitalize the first letter of each word.

Example

```
p.uppercase {text-transform:uppercase;}
p.lowercase {text-transform:lowercase;}
p.capitalize {text-transform:capitalize;}
```

Text Indentation

The text-indentation property is used to specify the indentation of the first line of a text.

Example

```
p {text-indent:50px;}
```

All CSS Text Properties

The number in the "CSS" column indicates in which CSS version the property is defined (CSS1 or CSS2).

Property	Description	Values	CSS
color	Sets the color of a text	*color*	1

direction	Sets the text direction	ltr rtl	2
line-height	Sets the distance between lines	normal *number* *length* *%*	1
letter-spacing	Increase or decrease the space between characters	normal *length*	1
text-align	Aligns the text in an element	left right center justify	1
text-decoration	Adds decoration to text	none underline overline line-through blink	1
text-indent	Indents the first line of text in an element	*length* *%*	1
text-shadow		none *color* *length*	
text-transform	Controls the letters in an element	none capitalize uppercase	1

		lowercase	
unicode-bidi		normal embed bidi-override	2
vertical-align	Sets the vertical alignment of an element	baseline sub super top text-top middle bottom text-bottom *length* *%*	1
white-space	Sets how white space inside an element is handled	normal pre nowrap	1
word-spacing	Increase or decrease the space between words	normal *length*	1

CLASS: I B.Sc IT COURSE CODE: 18ITU203 BATCH-2018-2021
COURSE NAME: COMPUTER NETWORKS AND INTERNET TECHNOLOGIES
UNIT: IV (Introduction to Web Design)

POSSIBLE QUESTIONS

Part-B (2 marks)

1. Define HTML
2. List the heading tags
3. Which tag is used for linking?
4. How will you create table using html?
5. Which attribute is used ofr inserting image?

Part-C (8 marks)

1. Design a bio-data in HTML
2. Write note on CSS by giving example.
3. Explain the following (i) <p> (ii)
 (iii) <hr> (iv)<pre>
4. Explain the structure of HTML program
5. Explain the basic elements of HTML

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DEPARTMENT OF CS,CA & IT

BATCH : 2018-2021

Unit -4 Part -A Multiple Choice Questions

Subject: Computer Network **Subject Code:18ITU203**

S.NO	Questions	OPT1	OPT2	OPT3	OPT4	ANSWER
1	SGML stands for_____	Standard Generalized Markup Language	Standard General Markup Language	Secure Generalized Markup Language	Secure General Markup Language	Standard Generalized Markup Language
2	_____define the	<body>	<big>	<bodydoc>	<bodystatement>	<body>
3	_____is the tag used to	dl	dt	dm	dlist	dl
4	_____is used for underline?	<i>	<tt>	<u>	<it>	<u>
5	____in the tag used to	<img>	<image>	<im>	<images>	<img>
6	How can you make a list that lists the item with numbers?			<dl>	<list>	
7	HTML stands for_____	Hyper Tool Markup Language	Hyper Text Markup Language	Hyphenation Test Marking Language	Hyphenation Text Markup Language	Hyper Text Markup Language
8	____is a tag used to define area inside the images map	<img>	<area>	<image>	<img map>	<area>
9	___is the element used to designate a section of text that	<body>	<background>	<pre>	<dis>	<pre>
10	The_____attribute	<backcolour>	<bgcolour>	bgcolour()	<bodycolour>	<bgcolour>
11	Which of the following statements is false about hosting?	Shared hosting is cheaper than dedicated hosting	Shared hosting is safer than dedicated hosting	Dedicated hosting is safer than shared hosting	Dedicated hosting is cheaper than dedicated hosting	Shared hosting is safer than dedicated hosting
12	Which of the following is not a web hosting company?	Facebook	Blue host	Wpx host	Hostgater	Facebook

13	which of the following statements is true?	The web design shouldn‟t just be concerned about looks but also about user interface	Usability is very important in web design	a and b	None of this	a and b
14	which of the following is true	Extension use of flash is bad from usability point of new	Design should be true from clutter	Looks are more important than usability	a and b	a and b
15	which of the following is not a CMS	Wordpress	Drupol	Magneto	SAP	SAP
16	which of the software could be used to build a website	powwrpoint	Excel	Dreamweaver	ERP	Dreamweaver
17	which of the following is tmu about PHP?	It is a server side scripting language	It is a client side scripting language	It is a software	It is a hardware	It is a sever side scripting language
18	SQL stands for _____	Structured Query Language	Statistical Query Language	Superior Query Language	Standard Query Language	Structured Query Language
19	Which of the following is mu about javascript?	It is a server side scripting language	It is a client side scripting language	It is a software	It is a database	It is a server side scripting language
20	value of attribute “href	URL	URM	URK	URS	URL
21	HTTP stands for _____	Hyper Text Transfer Protocol	Hyper Text Transfer Package	Hyphenation Text Test Program	None of the above	Hyper Text Transfer Protocol
22	What does the .com domain represents?	Education Domain	Commercial Domain	Network domain	None of the above	Commercial Domain
23	DNS ranslates_____	Domain name into ip	Ip into domain name	Both a and b	Domain name into physical address	Both a and b

24	How to set a picture as a background web pages?	<body background=”backpic.gif”>	<body background image=”backpic.gif”>	<background=”bacpic.gif”>	<background image=”backpic.gif”>	<body background=”backpic.gif”>
25	Domain name are used in___to identify particular	URL	domain	host	server	URL
26	_____is the part of the web page	domain	frame	website	link	Frame
27	what is a service that allows organizations and individuals	Web hosting	HTML	HTTP	Web design	Web hosting
28	_____are hosted or stored on special computers called	HTML	HTTP	Website	hosting	HTML
29	DNS means_____	Domain name server	Domain name system	Domain name service	Domain name site	Domain name server
30	what is a CMS in web design	Central Management System	Control Management System	Center Management System	Content Mixing System	Central Management System
31	To make your website	Response	Reactive	Fast loading	Light	Response
32	CSS stands for_____	Current Style Sheet	Current Sheet Style	Cascading Style Sheet	Cascading Sheets Style	Cascading Sheets Style
33	which of the following statements is false	You can make a website without using HTML	You can make a website without using PHP	You can make a website without using CSS	You can make a website without using java script	You can make a website without using HTML
34	what is word press	It is a software used to press text	It is a text formatting software	It is CMS	It is a mail service	It is a CMS
35	Link in HTML is specified using	srt	href	Link	rel	href
36	<a> is a _____tag	Actual tag	Action tag	Anchor tag	Additional tag	Anchor tag
37	URL in HTML stands for_____	Uniform Resource Locator	Uni Resource Locator	Universal Resource Locator	None of these	Uniform Resource Locator
38	Default color of active link in browser is red	Red	Blue	Green	Brown	Red
39	Which of the following alt	Target	hreflang	rel	All of these	All of these

40	what is the correct Html for referring to an external style sheet ?	<stylesheet>mystyle. CSS/stylesheet/>	<style src=”mystyle.CSS “/>	<link rel=”stylesheet”type=”text/CSS”href=Mystyle.CSS”>	<style src=mystyle.CSS/stylesheEt>	<link rel=”stylesheet”type=”text/CSS”href=Mystyle.CSS”>
41	where in an HTML document is the correct place to refer to an external style sheet?	At the end of the document	In the <head> section	At the top of the document	In the <body> section	In the <head> section
42	which is the correct CSS syntax?	Body{color:black}	{body:color=black (body)}	Body:color=black	Body[color;black]	Body{color:black}
43	which HTML attributes is used to define inline styles?	font	class	system	style	Style
44	which HTML tag is used to define an internal style sheet?	<style>	<CSS>	<script>	<class>	<style>
45	How do you insert a comment in a CSS file?	//this is a comment//	/*this is a comment*/	„this is s comment“	//this is a comment	//this is a comment//
46	Define the isnserted text in the HTML text formatting tags	<inserted text>	<ins>	<inserted>	<inst>	<ins>
47	Which is the correct deleted text formatting tag?	<del>	<delete text>	<deleted>	All the above	<del>
48	Which HTML text	<bold>	<bold text>	<bd>	<b>	<b>
49	HTML is a subset of	SGMD	SGML	SGMH	None of these	SGML
50	All HTML tags are enclosed in what?	# and #	? and !	< and >	{ and }	< and >
51	To create a HTML page, you need	Web browser	Text editor	Both a and b	None of the above	Both a and b
52	<a> and <b> are the tags used for	Adding image	Aligning text	Audio-voiced text	Adding links to your page	Adding links to your page
53	To add a plain color background to your webpage ,use which of the following ?	<body bgcolor=”36,24,35 ”>	<”bodycolor= “FF000”>	<bodybgcolor=” #FF000”>	All the above	<bodybgcolor=” #FF000”>
54	The body tag is usually used after	HTML tag	EM tag	TITLE tag	Head tag	Head tag
55	Choose the correct HTML tag to make a text italic	<i>	<italic>	<it>	<il>	<i>
56	what does the tag add to your webpage?	Long break	Paragraph break	Line break	None of the above	Line break

57	Adding border to your image helps the visitor to recognize it as what?	A frame	A link	A picture	None of the above	A link

UNIT V

JAVASCRIPT FUNDAMENTALS: Data types and variables, functions, methods and events, controlling program flow, JavaScript object model, built-in objects and operators.

JavaScript Fundamentals:

JavaScript is a scripting language that will allow we to add real programming to we webpages. We can create small application type processes with javascript, like a calculator or a primitive game of some sort.

There are more serious uses for javascript:

- Browser Detection
  Detecting the browser used by a visitor at web page. Depending on the browser, another page specifically designed for that browser can then be loaded.
- Cookies
  Storing information on the visitor's computer, then retrieving this information automatically next time the user visits we page. This technique is called "cookies".
- Control Browsers
  Opening pages in customized windows, where we specify if the browser's buttons, menu line, status line or whatever should be present.
- Validate Forms
  Validating inputs to fields before submitting a form.
  An example would be validating the entered email address to see if it has an @ in it, since if not, it's not a valid address.

JavaScript Origins

JavaScript was released by Netscape and Sun Microsystems in 1995. JavaScript is not the same thing as Java.

What is JavaScript?

- It is a programming language.
- It is an interpreted language.
- It is object-based programming.
- It is widely used and supported
- It is accessible to the beginner.

Uses of JavaScript

• Use it to add multimedia elements

With JavaScript we can show, hide, change, resize images, and create image rollovers. We can create scrolling text across the status bar.

• Create pages dynamically

Based on the user's choices, the date, or other external data, JavaScript can produce pages that are customized to the user.

• Interact with the user

It can do some processing of forms and can validate user input when the user submits the form.

Writing JavaScript

JavaScript code is typically embedded in the HTML, to be interpreted and run by the client's browser. Here are some tips to remember when writing JavaScript commands.

• JavaScript code is case sensitive
• White space between words and tabs are ignored
• Line breaks are ignored except within a statement
• JavaScript statements end with a semi- colon ;

The SCRIPT Tag

The <SCRIPT> tag alerts a browser that JavaScript code follows. It is typically embedded in the HTML.

```
<SCRIPT language = "JavaScript">
statements
</SCRIPT>
```

SCRIPT Example

• Open "script_tag.html" in a browser.
• View the Source
• Put the cursor after <! – Enter code below Æ and enter the following:

```
<SCRIPT language = "JavaScript">
alert("Welcome to the script tag test page.")
</SCRIPT>
```

- Save the changes by choosing Save from the File menu.
- Then Refresh the browser by clicking the Refresh or Reload button

Implementing JavaScript

There are three ways to add JavaScript commands to we Web Pages.

- Embedding code
- Inline code
- External file

External File

We can use the SRC attribute of the <SCRIPT> tag to call JavaScript code from an external text file. This is useful if we have a lot of code or we want to run it from several pages, because any number of pages can call the same external JavaScript file. The text file itself contains no HTML tags. It is call by the following tag:

```
<SCRIPT SRC="filename.js">
</SCRIPT>
```

External Example

- Open "external.html" in a browser
- View the Source
- Put the cursor after <! – Enter code here Æ and enter:

```
<SCRIPT language = "JavaScript" SRC = "external.js">
</SCRIPT>
```

- Save the changes and Refresh the browser.

Datatypes and Variables:

JavaScript Data Types

String, Number, Boolean, Array, Object, Null, Undefined.

JavaScript Has Dynamic Types

JavaScript has dynamic types. This means that the same variable can be used as different types:

Example

```
var x;              // Now x is undefined
var x = 5;          // Now x is a Number
var x = "John";     // Now x is a String
```

JavaScript Strings

A string is a variable which stores a series of characters like "John Doe".

A string can be any text inside quotes. We can use single or double quotes:

Example

```
var carname="Volvo XC60";
var carname='Volvo XC60';
```

Can use quotes inside a string, as long as they don't match the quotes surrounding the string:

Example

```
var answe="It's alright";
var answe="He is called 'Johnny'";
var answe='He is called "Johnny"';
```

JavaScript Numbers

JavaScript has only one type of numbers. Numbers can be written with, or without decimals:

Example

```
var x1=34.00;      // Written with decimals
var x2=34;         // Written without decimals
```

Extra large or extra small numbers can be written with scientific (exponential) notation:

Example

```
var y=123e5;      // 12300000
var z=123e-5;     // 0.00123
```

JavaScript Booleans

Booleans can only have two values: true or false.

```
var x=true;
var y=false;
```

Booleans are often used in conditional testing.

JavaScript Arrays

The following code creates an Array called cars:

```
var cars=new Array();
cars[0]="Saab";
cars[1]="Volvo";
cars[2]="BMW";
```

or (condensed array):

var cars=new Array("Saab","Volvo","BMW");

or (literal array):

Example

var cars=["Saab","Volvo","BMW"];

JavaScript Variables:

Like many other programming languages, JavaScript has variables. Variables can be thought of as named containers. We can place data into these containers and then refer to the data simply by naming the container.
Before we use a variable in a JavaScript program, we must declare it. Variables are declared with the **var** keyword as follows:

```
<script type="text/javascript">
<!--
var money;
var name;
//-->
</script>
```

We can also declare multiple variables with the same **var** keyword as follows:

```
<script type="text/javascript">
<!--
var money, name;
//-->
</script>
```

Storing a value in a variable is called variable initialization. We can do variable initialization at the time of variable creation or later point in time when we need that variable as follows:
For instance, we might create a variable named *money* and assign the value 2000.50 to it later. For another variable we can assign a value the time of initialization as follows:

```
<script type="text/javascript">
<!--
var name = "Ali";
var money;
money = 2000.50;
//-->
</script>
```

JavaScript Variable Scope:

The scope of a variable is the region of we program in which it is defined. JavaScript variable will have only two scopes.

- **Global Variables:** A global variable has global scope which means it is defined everywhere in we JavaScript code.
- **Local Variables:** A local variable will be visible only within a function where it is defined. Function parameters are always local to that function.

Within the body of a function, a local variable takes precedence over a global variable with the same name. If we declare a local variable or function parameter with the same name as a global variable, we effectively hide the global variable. Following example explains it:

```
<script type="text/javascript">
<!--
var myVar = "global"; // Declare a global variable
function checkscope( ) {
  var myVar = "local";  // Declare a local variable
  document.write(myVar);
}
//-->
</script>
```

This produces the following result:

Local

JavaScript Variable Names:

While naming variables in JavaScript keep following rules in mind.

- We should not use any of the JavaScript reserved keyword as variable name. These keywords are mentioned in the next section. For example, *break* or *boolean* variable names are not valid.
- JavaScript variable names should not start with a numeral (0-9). They must begin with a letter or the underscore character. For example, *123test* is an invalid variable name but_*123test* is a valid one.
- JavaScript variable names are case sensitive. For example, *Name* and *name* are two different variables.

Functions, Methods and Events:
Functions:

A function is a group or block of statements doing a specific task.

Syntax:

```
function name()
{
        // set of statements that will be executed
```

}

A function has to be defined in the above syntax. The name "function" followed by the name we choose for the function and then open and close brackets. The statements that will do the specific operation are then group together under this name using braces.
A function may or may not return a value. A function may or may not have parameters value.

Invoking a function:

The statements inside the function will not be executed automatically. We have to invoke or call the function to execute the statements. Just calling the name of the function will invoke the function. i.e. if we write a function with the name "test" calling it as "test();" will invoke the function.

Example Code:

```
<script language="javascript">
function test()
{
    document.write(" ---- This is a test function ---- ");
}

test();
</script>
```

Result:

---- This is a test function ----

Syntax:

```
function name(parameter 1,parameter 2,...)
{
    // set of statements that will be executed
}
```

Passing Parameters to Functions:

In many cases we pass parameters or arguments to functions, these arguments will be used inside the function for required calculations. For an example we will use two numbers to add, subtract using function.

Here we write separate function for each operations add, subtract.

Example Code:

```
<script language="javascript">
```

```
function add(number1, number2)
{
    var c = number1+number2;
    document.write(" ---- This added value is ---- "+c;
}

function sub(number1, number2)
{
    var c = number1-number2;
    document.write(" ---- This subtracted value is ---- "+c;
}

var a = 7;
var b = 3;
add(a,b);
sub(a,b);
</script>
```

Result:

---- This added value is ---- 10
---- This subtracted value is ---- 4

Here we can clearly see that the two functions where invoked as "add(a,b);" and "sub(a,b);" where a and b are defined variables. We can even call the function directly with the variables as say "add(9,1);".

A function can be invoked any number of times with any proper value.

Returning Values:

Syntax:

```
function name(parameter 1,parameter 2,...)
{
    // set of statements that will be executed
return thevalue;
}
```

A function can also **return a value** after doing the specified operations. To explain, we would consider a requirement where we have to calculate $x^2/2$.
We will calculate x^2 in a function and return the result of x^2. After getting the return value, we will divide it by 2.

Example Code:

```
<script language="javascript">

function square(number1)
```

```
{
    var c = number1*number1;
    // Now we will return the result
    return c;
}

var x = 4;
// Here we invoke the function and capture the result
var des = square(x);
var res = des/2;
document.write(" The result - "+res);
</script>
```

Result:
The result – 8

A *method* is a function associated with an object. You define a method in the same way as you define a standard function. Then, use the following syntax to associate the function with an existing object:
object.methodname = function_name
where *object* is an existing object, *methodname* is the name you are assigning to the method, and *function_name* is the name of the function.
You can then call the method in the context of the object as follows:
object.methodname(params);

Predefined Functions:

The following are the predefined functions in javascript.

isNaN()
isNaN() method determines whether value of a variable is a legal number or not.

```
document.write(isNan(0));
document.write(isNan("Javascript"));
document.write(isNan(-2.45));
document.write(isNan("77"));
document.write(isNan("2012/4/8"));
```

Results:
false
true
false
false
true

Note: There is a property called NaN of the Number Object which can be used to assign a variable with 'not a number' value.

```
var year= Number.NaN;
document.write(year);
```

Result: **NaN**

isFinite()

As the name indicates, this function is used to find whether a number is a finite legal number.

```
document.write(isFinite("5678"));
document.write(isFinite("ABCD"));
document.write(isFinite("123_456"));
```

Result:

true
false
false

eval()

eval() is used to execute Javascript source code. It evaluates or executes the argument passed to it and generates output.

```
eval("var number=2;number=number+2;document.write(number)");
```

Result:

4

Number()

Number() method takes an object as an argument and converts it to the corresponding number value. If the object passed cannot be converted to a number, that is if the object is not in a format to be represented as a number, then it returns NaN(not a number).

```
var obj1=new String("123");
var obj2=new Boolean("false");
var obj3=new Boolean("true");
var obj4=new Date();
var obj5=new String("9191 9999");
document.write(Number(obj1));
document.write(Number(obj2));
document.write(Number(obj3));
document.write(Number(obj4));
document.write(Number(obj5));
```

Result:

123
0
1
1342720050291
NaN

String()

String() function converts the object argument passed to it to a string value.

```
var obj1=new Boolean(0);
var obj2=new Boolean(1);
var obj3=new Date();
document.write(String(obj1));
document.write(String(obj2));
document.write(String(obj3));
```

Result:

false
true
Thu Jul 19 2012 23:28:08 GMT+0530 (India Standard Time)

parseInt()

parseInt() function takes string as a parameter and converts it to integer.

```
document.write(parseInt("50"));
document.write(parseInt("77 days"));
document.write(parseInt("this is 7"));
```

Result:

50
77
NaN

An optional radix parameter can also be used to specify the number system to be used to parse the string argument. For example,

```
document.write(parseInt("10",16));
```

Result:
16

If the radix parameter is not specified, then Javascript

- Assumes radix to be 16(hexadecimal), if the string starts with "0x"
- Assumes radix to be 8(octal), if the string starts with 0
- Assumes radix to be 10(decimal), if the string starts with any other number.

parseFloat()

parseFloat() function takes a string as parameter and parses it to a floating point number.

```
document.write(parseFloat("10.33"));
```

```
document.write(parseFloat("15 66 75"));
document.write(parseFloat("this is 77"));
document.write(pareFloat("    77    "));
```

Result:

10.33
15
NaN
77

This function allows leading and trailing spaces. If the first character in the string is not a number, then it returns NaN. If the string has more than one set of number separated by delimiters such as spaces, semicolons,commas then it returns only the first set of number before the first delimiter.

escape()

escape() function encodes the string passed to it so that it can be used across any network, say for example in query strings.

```
document.write(escape("testing escape function!!"));
```

Result:

testing%20escape%20function%21%21

Methods:

JavaScript methods are actions that can be performed on objects.
A JavaScript method is a property containing a function definition.

Property	Value
firstName	John
lastName	Doe
age	50
eyeColor	blue
fullName	function() {return this.firstName + " " + this.lastName;}

Methods are functions stored as object properties.

Accessing Object Methods:

You access an object method with the following syntax:
objectName.methodName()
You will typically describe fullName() as a method of the person object, and fullName as a property.
The fullName property will execute (as a function) when it is invoked with ().
The following statement accesses the fullName() method of a person object:

```
name = person.fullName();
```

Example:

Program:

```
<!DOCTYPE html>
<html>
<body>
<p>Creating and using an object method.</p>
<p>A method is actually a function definition stored as a property value.</p>
<p id="demo"></p>
<script>
var person = {
  firstName: "John",
  lastName : "Doe",
  id     : 5566,
  fullName : function() {
    return this.firstName + " " + this.lastName;
  }
};

document.getElementById("demo").innerHTML = person.fullName();
</script>
</body>
</html>
```

Output:

Creating and using an object method.
A method is actually a function definition stored as a property value.
John Doe

Events:

JavaScript's interaction with HTML is handled through events that occur when the user or the browser manipulates a page.

When the page loads, it is called an event. When the user clicks a button, that click too is an event. Other examples include events like pressing any key, closing a window, resizing a window, etc.

Developers can use these events to execute JavaScript coded responses, which cause buttons to close windows, messages to be displayed to users, data to be validated, and virtually any other type of response imaginable.

Events are a part of the Document Object Model (DOM) Level 3 and every HTML element contains a set of events which can trigger JavaScript Code.

The standard HTML 5 events are listed here for your reference. Here script indicates a Javascript function to be executed against that event.

Attribute	Value	Description

Offline	script	Triggers when the document goes offline
onchange	script	Triggers when an element changes
onclick	script	Triggers on a mouse click
ondblclick	script	Triggers on a mouse double-click
ondrag	script	Triggers when an element is dragged
oninput	script	Triggers when an element gets user input
onkeydown	script	Triggers when a key is pressed
onkeypress	script	Triggers when a key is pressed and released
onkeyup	script	Triggers when a key is released
onload	script	Triggers when the document loads
onmousedown	script	Triggers when a mouse button is pressed
onmousemove	script	Triggers when the mouse pointer moves
onmouseover	script	Triggers when the mouse pointer moves over an element
onmouseup	script	Triggers when a mouse button is released
onmousewheel	script	Triggers when the mouse wheel is being rotated

onclick Event Type:

This is the most frequently used event type which occurs when a user clicks the left button of his mouse. You can put your validation, warning etc., against this event type.

Example

```
<html>
  <head>
        <script type="text/javascript">
      <!--
        function sayHello() {
```

```
            alert("Hello World")
          }
        //-->
      </script>
        </head>
      <body>
      <p>Click the following button and see result</p>
          <form>
        <input type="button" onclick="sayHello()" value="Say Hello" />
      </form>
    </body>
</html>
```

Output

onsubmit Event type:

onsubmit is an event that occurs when you try to submit a form. You can put your form validation against this event type.

Example

The following example shows how to use onsubmit. Here we are calling a validate() function before submitting a form data to the webserver. If validate() function returns true, the form will be submitted, otherwise it will not submit the data.

```
<html>
  <head>
    <script type="text/javascript">
      <!--
        function validation() {
          all validation goes here
          .........
          return either true or false
        }
      //-->
    </script>
      </head>
  <body>
      <form method="POST" action="t.cgi" onsubmit="return validate()">
      .......
      <input type="submit" value="Submit" />
    </form>

  </body>
</html>
```

Controlling Program Flow:

Conditional Statements

If statement is used to check or verify a condition and execute a set of statement only if the condition is true. This should be referred as a statement and not as a function.

Syntax:

```
if(condition)
{
    // set of statements that will be executed
    // only if the condition is true or satisfied
}
```

Example Code:

```
<script language="javascript">
var a = "if check";
if(a == "if check")
{
document.write(" inside if statement ");
}
</script>
```

Result:

inside if statement

Nested If:

Nested if statement is nothing but using an if statement inside another if statement. Nested if is used when we check a condition only when another condition is true. For an example when we purchase a car, first we verify is the car looks good, only if it satisfies we go to the next condition color, then next and so on..

Syntax: Nested if

```
if(condition 1)
{
    if(condition 2)
     {
    // set of statements that will be executed
     }
}
```

If else statement:

If else statement also has the same format as that of "if" statement. Only additional thing is that an else part is added to if statement. So if the condition satisfies the statements inside if part will be executed else the statement inside else part will be executed.

Syntax:

```
if(condition){
```

```
    // set of statements if condition satisfies
}
else{
    // set of statements if condition fails
}
```

Example Code:

```
<script language="javascript">
var a = "1234abc";
if(a == "adcdefa"){
        document.write(" inside if statement ");
}else{
        document.write(" inside else part of statement ");
}
</script>
```

Result:

inside else part of statement

In the above example the condition is to check if variable 'a' equals (==) "abcdefa". The condition fails as we have assigned a as "1234abc". So the else part is executed.

Switch case:

Switch case is used to when a condition may have multiple results and a different set of operation is done based on each result..

Syntax:

```
Switch(condition)
{
case result1:
    // Operation for result1

case result2:
    // Operation for result2
.
.
.
default :
    // If result belongs to none of the case specified }
```

Example Code:

```
<script language="javascript">
for(var i=1; i<5; i++)
{
```

```
switch(i)
{
   case 1:
      document.write("message for case 1 <br>");
      break;
   case 2:
      document.write("message for case 2 <br>");
      break;
   case 3:
      document.write("message for case 3 <br>");
      break;
   default:
      document.write("message for case default<br>");
      break;
}
}
</script>
```

Result:

message for case 1
message for case 2
message for case 3
message for case default

"with" statement is used when numerous function of an object is used or a function of an object is to be used numerous times.

With Statement:

Syntax:

```
with(object)
{
    // Calling the functions or methods of the object
}
```

For this example we will use the object "document" and its methods (functions) "write" and attribute "title".

Example Code:

```
<script language="javascript">
with(document)
{
write(" inside with statement <br>");
write(" using with(object) we can call its functions directly <br>");
write (" TITLE -"+title);
```

```
}
</script>
```

Result:

```
inside with statement
using with(object) we can call its functions directly
TITLE - With Statement Code - Javascript (JS) Tutorial
```

In the above example we can clearly see that the write function is executed numerous times with out calling document.write() and also title (document.title) is called. We can use any objects with "with" statement. e.g: date, math, etc.

LOOPING STATEMENTS:

for LOOP:

A set of statements are executed as a loop until a condition is satisfied, the condition is based on an incremental or decremental counter. In other words "Looping statements in javascript are used to execute the same set of code a specified number of times".

Syntax:

```
for(intialvalue; condition; increment)
{
    // set of statements that will be executed
}
```

As defined in the syntax, for loop takes three parameters, the initial value (e.g i=0), condition - the statements inside "for" will be executed until this condition is satisfied (e.g i<7), increment - this is where we set the initial value to be increased or decreased after each loop.
All the three parameters are separated by semicolon ";".

For an example, we will consider a situation where we want to add all numbers between one and ten.

Example Code:

```
<script language="javascript">
var i=0; var total=0;
for(i=1; i<11; i++)
{
total = total+i;
}
document.write("--------- The total ------: "+total);
</script>
```

Result:

```
--------- The total ------: 45
```

For... in Statement:

There is one more loop supported by JavaScript. It is called **for...in** loop. This loop is used to loop through an object's properties.

Because we have not discussed Objects yet, so we may not feel comfortable with this loop. But once we will have understanding on JavaScript objects then we will find this loop very useful.

Syntax:

```
for (variablename in object){
  statement or block to execute
}
```

In each iteration one property from *object* is assigned to *variablename* and this loop continues till all the properties of the object are exhausted.

Example:

Here is the following example that prints out the properties of a Web browser's **Navigator**object:

```
<script type="text/javascript">
<!--
var aProperty;
document.write("Navigator Object Properties<br /> ");
for (aProperty in navigator)
{
  document.write(aProperty);
  document.write("<br />");
}
document.write("Exiting from the loop!");
//-->
</script>
```

This will produce following result:

```
Navigator Object Properties
appCodeName
appName
appMinorVersion
cpuClass
platform
plugins
opsProfile
userProfile
systemLanguage
userLanguage
appVersion
userAgent
onLine
cookieEnabled
mimeTypes
Exiting from the loop!
```

While Loop:

Explanation

'while' loop is used to execute a set of statements repeatedly until a condition works true. The difference between 'for' and 'while' loop is that 'while' does not take counter as an argument.

Syntax:

```
while(condition)
{
    // set of statements that will be executed
}
```

As defined in the syntax, while loop has only one parameter, condition to be validated. The statements inside "while" will be executed until this condition becomes false.

For an example, we will consider a situation where we want to print first 5 number.

Example Code:

```
<script language="javascript">
var i=0;
while(i<5)
{
document.write("The value of i is - "+i+" ");
i++;
}
</script>
```

Result:

```
The value of i is - 0
The value of i is - 1
The value of i is - 2
The value of i is - 3
The value of i is - 4
```

Do...While

'do-while' loop is similar to while loop and the only difference here is that the set of statements are executed first and the condition is checked next.

Syntax:

```
do
{
    // set of statements that will be executed
```

```
}
while(condition)
```

Here the statements are added under do loop and while condition is checked at the end of loop. In 'Do While' the statements are executed once even if the condition will fail.

An example

Example Code:

```
<script language="javascript">
var i=0;
do
{
document.write("Testing DO-While loop");
}
while(i!=0)
</script>
```

Result:

Testing DO-While loop

Break statement :

Break is a statement used to exit or terminate a loop in execution. It is used in "for, while, do-while" looping statements.**Break statement** is used mostly with a conditional statement inside the loop. When the condition satisfies the control breaks/terminates from the loop and moves to the next line below the loop.

For an example, we will use a for loop that prints 1 to 5 but will use break or exit the loop iteration when i is 3.

Example Code:

```
<script language="javascript">
for(var i=0; i<5; i++)
{
      if(i == 3)
         break;
       document.write("i is - "+i);
}
document.write(" --------- After Looping------ ");
</script>
```

Result:

```
i is - 0
i is - 1
i is - 2
```

Continue statement :

Continue statement is used to stop or terminate one iteration of the loop in execution. It is used in "for, while, do-while" looping statements. Continue statement unlike break statement does not completely terminate the loop. It stops processing for only one iteration and brings the control back to the beginning of the loop.

For an example, we will try to stop processing inside a for loop when i is 2.

Example Code:

```
<script language="javascript">
for(var i=0; i<5; i++)
{
      if(i == 2)
        continue;
       document.write("i is - "+i);
}
</script>
```

Result:

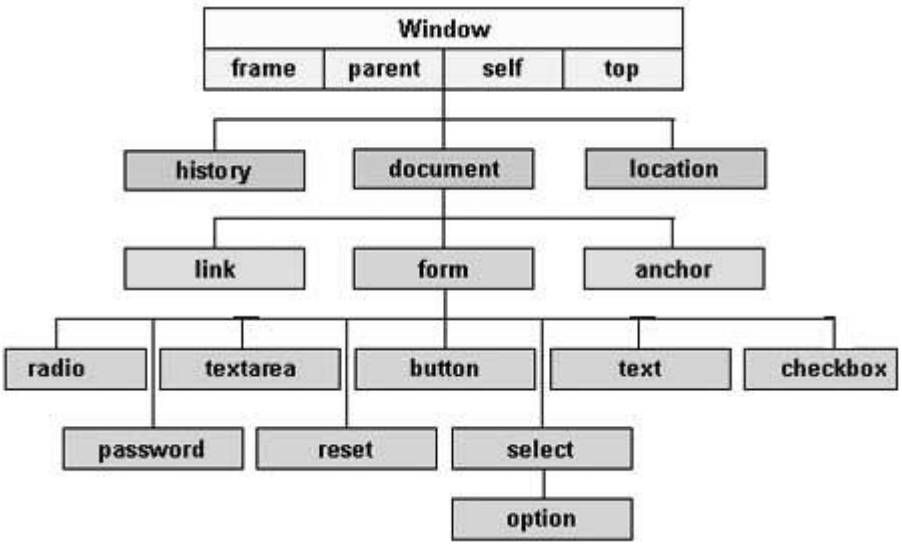
```
i is - 0
i is - 1
i is - 3
i is - 4
```

Javascript Object Model:

Every web page resides inside a browser window which can be considered as an object.
A Document object represents the HTML document that is displayed in that window. The Document object has various properties that refer to other objects which allow access to and modification of document content.
The way document content is accessed and modified is called the **Document Object Model**, or **DOM**. The Objects are organized in a hierarchy. This hierarchical structure applies to the organization of objects in a Web document.

- **Window object** − Top of the hierarchy. It is the outmost element of the object hierarchy.
- **Document object** − Each HTML document that gets loaded into a window becomes a document object. The document contains the contents of the page.
- **Form object** − Everything enclosed in the <form>...</form> tags sets the form object.
- **Form control elements** − The form object contains all the elements defined for that object such as text fields, buttons, radio buttons, and checkboxes.

Here is a simple hierarchy of a few important objects −



There are several DOMs in existence. The following sections explain each of these DOMs in detail and describe how you can use them to access and modify document content.

- The Legacy DOM − This is the model which was introduced in early versions of JavaScript language. It is well supported by all browsers, but allows access only to certain key portions of documents, such as forms, form elements, and images.
- The W3C DOM − This document object model allows access and modification of all document content and is standardized by the World Wide Web Consortium (W3C). This model is supported by almost all the modern browsers.
- The IE4 DOM − This document object model was introduced in Version 4 of Microsoft's Internet Explorer browser. IE 5 and later versions include support for most basic W3C DOM features.

Java Built-in Objects:

There are several Javascript built-in objects such as,

- Number
- String
- RegExp
- Array
- Math
- Date
- Boolean

Each of the above objects hold several built-in functions to perform object related functionality. Apart from these methods, Javascript provides few predefined functions which do not stick to a particular object type but are global. These global built-in functions are explained below with examples.

Array object:

The **Array** object let's we store multiple values in a single variable.

Syntax:

Creating a **Array** object:

var fruits = new Array("apple", "orange", "mango");

The *Array* parameter is a list of strings or integers. When we specify a single numeric parameter with the Array constructor, we specify the initial length of the array. The maximum length allowed for an array is 4,294,967,295.
We can create array by simply assigning values as follows:

var fruits = ["apple", "orange", "mango"];

We will use ordinal numbers to access and to set values inside an array as follows:

- fruits[0] is the first element
- fruits[1] is the second element
- fruits[2] is the third element

Boolean object:

The **Boolean** object represents two values either "true" or "false".

Syntax:

Creating a **boolean** object:

var val = new Boolean(value);

If *value* parameter is omitted or is 0, -0, null, false, NaN, undefined, or the empty string (""), the object has an initial value of false.

Boolean Properties:

Here is a list of each property and their description.

Property	Description
constructor	Returns a reference to the Boolean function that created the object.
prototype	The prototype property allows we to add properties and methods to an object.

String object:

Syntax:

Creating a **String** object:

var val = new String(string);

The *string* parameter is series of characters that has been properly encoded.

String Properties:

Here is a list of each property and their description.

Property	Description

constructor	Returns a reference to the String function that created the object.
length	Returns the length of the string.
prototype	The prototype property allows we to add properties and methods to an object.

Number object:

The **Number** object represents numerical date, either integers or floating-point numbers. In general, we do not need to worry about **Number** objects because the browser automatically converts number literals to instances of the number class.

Syntax:

Creating a **number** object:

```
var val = new Number(number);
```

If the argument cannot be converted into a number, it returns NaN (Not-a-Number).

Number Properties:

Here is a list of each property and its description.

Property	Description
MAX_VALUE	The largest possible value a number in JavaScript can have 1.7976931348623157E+308
MIN_VALUE	The smallest possible value a number in JavaScript can have 5E-324
NaN	Equal to a value that is not a number.
NEGATIVE_INFINITY	A value that is less than MIN_VALUE.
POSITIVE_INFINITY	A value that is greater than MAX_VALUE
prototype	A static property of the Number object. Use the prototype property to assign new properties and methods to the Number object in the current document

Date object

The Date object is a datatype built into the JavaScript language. Date objects are created with the **new Date( )** as shown below.

Once a Date object is created, a number of methods allow we to operate on it. Most methods simply allow we to get and set the year, month, day, hour, minute, second, and millisecond fields of the object, using either local time or UTC (universal, or GMT) time.

The ECMAScript standard requires the Date object to be able to represent any date and time, to millisecond precision, within 100 million days before or after 1/1/1970. This is a range of plus or minus 273,785 years, so the JavaScript is able to represent date and time till year 275755.

Syntax:

Here are different variant of Date() constructor:

```
new Date( )
new Date(milliseconds)
new Date(datestring)
new Date(year,month,date[,hour,minute,second,millisecond ])
```

Note: Paramters in the brackets are always optional
Here is the description of the parameters:

- **No Argument:** With no arguments, the Date( ) constructor creates a Date object set to the current date and time.
- **milliseconds:** When one numeric argument is passed, it is taken as the internal numeric representation of the date in milliseconds, as returned by the getTime( ) method. For example, passing the argument 5000 creates a date that represents five seconds past midnight on 1/1/70.
- **datestring:**When one string argument is passed, it is a string representation of a date, in the format accepted by the Date.parse( ) method.
- **7 agruments:** To use the last form of constructor given above, Here is the description of each argument:
    1. **year:** Integer value representing the year. For compatibility (in order to avoid the Y2K problem), we should always specify the year in full; use 1998, rather than 98.
    2. **month:** Integer value representing the month, beginning with 0 for January to 11 for December.
    3. **date:** Integer value representing the day of the month.
    4. **hour:** Integer value representing the hour of the day (24-hour scale).
    5. **minute:** Integer value representing the minute segment of a time reading.
    6. **second:** Integer value representing the second segment of a time reading.
    7. **millisecond:** Integer value representing the millisecond segment of a time reading.

Window Object

The window object represents an open window in a browser. If a document contain frames (<frame> or <iframe> tags), the browser creates one window object for the HTML document, and one additional window object for each frame.
Note: There is no public standard that applies to the Window object, but all major browsers support it.

Window Object Properties

Property	Description

closed	Returns a Boolean value indicating whether a window has been closed or not
defaultStatus	Sets or returns the default text in the statusbar of a window
document	Returns the Document object for the window (See Document object)
frames	Returns an array of all the frames (including iframes) in the current window
history	Returns the History object for the window (See History object)
innerHeight	Sets or returns the inner height of a window's content area
innerWidth	Sets or returns the inner width of a window's content area
length	Returns the number of frames (including iframes) in a window
location	Returns the Location object for the window (See Location object)
name	Sets or returns the name of a window
navigator	Returns the Navigator object for the window (See Navigator object)
opener	Returns a reference to the window that created the window
outerHeight	Sets or returns the outer height of a window, including toolbars/scrollbars
outerWidth	Sets or returns the outer width of a window, including toolbars/scrollbars
pageXOffset	Returns the pixels the current document has been scrolled (horizontally) from the upper left corner of the window
pageYOffset	Returns the pixels the current document has been scrolled (vertically) from the upper left corner of the window
parent	Returns the parent window of the current window
screen	Returns the Screen object for the window (See Screen object)
screenLeft	Returns the x coordinate of the window relative to the screen

screenTop	Returns the y coordinate of the window relative to the screen
screenX	Returns the x coordinate of the window relative to the screen
screenY	Returns the y coordinate of the window relative to the screen
self	Returns the current window
status	Sets or returns the text in the statusbar of a window
top	Returns the topmost browser window

The Document Object:

When an HTML document is loaded into a web browser, it becomes a **document object**.
The document object is the root node of the HTML document and the "owner" of all other nodes: (element nodes, text nodes, attribute nodes, and comment nodes).
The document object provides properties and methods to access all node objects, from within JavaScript.

- The document is a part of the window object and can be accessed as window.document.

Document Object Properties and Methods

The following properties and methods can be used on HTML documents:

Property / Method	Description
document.adoptNode(node)	Returns an adapded node from another document to this document.
document.anchors	Returns a collection of all the anchors in the document
document.applets	Returns a collection of all the applets in the document
document.baseURI	Returns the absolute base URI of a document
document.body	Returns the body element of the document
document.close()	Closes the output stream previously opened with document.open()

document.cookie	Returns all name/value pairs of cookies in the document
document.createAttribute()	Creates an attribute node
document.createComment()	Creates a Comment node with the specified text
document.createDocumentFragment()	Creates an empty DocumentFragment node
document.createElement()	Creates an Element node
document.createTextNode()	Creates a Text node
document.doctype	Returns the Document Type Declaration associated with the document
document.documentElement	Returns the Document Element of the document (the HTML element)
document.documentMode	Returns the mode used by the browser to render the document
document.documentURI	Sets or returns the location of the document
document.domain	Returns the domain name of the server that loaded the document
document.domConfig	Returns the configuration used when normalizeDocument() is invoked
document.forms	Returns a collection of all the forms in the document
document.getElementById()	Returns the element that has the ID attribute with the specified value
document.getElementsByName()	Accesses all elements with a specified name
document.getElementsByTagName()	Returns a NodeList containing all elements with the specified tagname
document.images	Returns a collection of all the images in the document
document.implementation	Returns the DOMImplementation object that

	handles this document
document.importNode()	Imports a node from another document
document.inputEncoding	Returns the encoding, character set, used for the document
document.lastModified	Returns the date and time the document was last modified
document.links	Returns a collection of all the links in the document
document.normalize()	Removes empty Text nodes, and joins adjacent nodes
document.normalizeDocument()	Removes empty Text nodes, and joins adjacent nodes
document.open()	Opens an HTML output stream to collect output from document.write()
document.readyState	Returns the (loading) status of the document
document.referrer	Returns the URL of the document that loaded the current document
document.renameNode()	Renames the specified node

Operators in Java Script:

What is an operator?

It can be given by using the expression *4 + 5 is equal to 9*. Here 4 and 5 are called operands and + is called operator. JavaScript language supports following type of operators.

- Arithmetic Operators
- Comparision Operators
- Logical (or Relational) Operators
- Assignment Operators
- Conditional (or ternary) Operators

Lets have a look on all operators one by one.

The Arithmetic Operators:

There are following arithmatic operators supported by JavaScript language:
Assume variable A holds 10 and variable B holds 20 then:

Operator	Description	Example
+	Adds two operands	A + B will give 30
-	Subtracts second operand from the first	A - B will give -10
*	Multiply both operands	A * B will give 200
/	Divide numerator by denumerator	B / A will give 2
%	Modulus Operator and remainder of after an integer division	B % A will give 0
++	Increment operator, increases integer value by one	A++ will give 11
--	Decrement operator, decreases integer value by one	A-- will give 9

Note: Addition operator (+) works for Numeric as well as Strings. e.g. "a" + 10 will give "a10".

The Comparison Operators:

There are following comparison operators supported by JavaScript language
Assume variable A holds 10 and variable B holds 20 then:

Operator	Description	Example
==	Checks if the value of two operands are equal or not, if yes then condition becomes true.	(A == B) is not true.
!=	Checks if the value of two operands are equal or not, if values are not equal then condition becomes true.	(A != B) is true.
>	Checks if the value of left operand is greater than the value of right operand, if yes then condition becomes true.	(A > B) is not true.
<	Checks if the value of left operand is less than the value of right operand, if yes then condition becomes true.	(A < B) is true.
>=	Checks if the value of left operand is greater than or equal to the value of right operand, if yes then condition becomes true.	(A >= B) is not true.

<=	Checks if the value of left operand is less than or equal to the value of right operand, if yes then condition becomes true.	(A <= B) is true.

The Logical Operators:

There are following logical operators supported by JavaScript language
Assume variable A holds 10 and variable B holds 20 then:

Operator	Description	Example
&&	Called Logical AND operator. If both the operands are non zero then then condition becomes true.	(A && B) is true.
||	Called Logical OR Operator. If any of the two operands are non zero then then condition becomes true.	(A || B) is true.
!	Called Logical NOT Operator. Use to reverses the logical state of its operand. If a condition is true then Logical NOT operator will make false.	!(A && B) is false.

The Bitwise Operators:

There are following bitwise operators supported by JavaScript language
Assume variable A holds 2 and variable B holds 3 then:

Operator	Description	Example
&	Called Bitwise AND operator. It performs a Boolean AND operation on each bit of its integer arguments.	(A & B) is 2 .
|	Called Bitwise OR Operator. It performs a Boolean OR operation on each bit of its integer arguments.	(A | B) is 3.
^	Called Bitwise XOR Operator. It performs a Boolean exclusive OR operation on each bit of its integer arguments. Exclusive OR means that either operand one is true or operand two is true, but not both.	(A ^ B) is 1.
~	Called Bitwise NOT Operator. It is a is a unary operator and operates by reversing all bits in the operand.	(~B) is -4 .

<<	Called Bitwise Shift Left Operator. It moves all bits in its first operand to the left by the number of places specified in the second operand. New bits are filled with zeros. Shifting a value left by one position is equivalent to multiplying by 2, shifting two positions is equivalent to multiplying by 4, etc.	(A << 1) is 4.
>>	Called Bitwise Shift Right with Sign Operator. It moves all bits in its first operand to the right by the number of places specified in the second operand. The bits filled in on the left depend on the sign bit of the original operand, in order to preserve the sign of the result. If the first operand is positive, the result has zeros placed in the high bits; if the first operand is negative, the result has ones placed in the high bits. Shifting a value right one place is equivalent to dividing by 2 (discarding the remainder), shifting right two places is equivalent to integer division by 4, and so on.	(A >> 1) is 1.
>>>	Called Bitwise Shift Right with Zero Operator. This operator is just like the >> operator, except that the bits shifted in on the left are always zero,	(A >>> 1) is 1.

The Assignment Operators:

There are following assignment operators supported by JavaScript language:

Operator	Description	Example
=	Simple assignment operator, Assigns values from right side operands to left side operand	C = A + B will assigne value of A + B into C
+=	Add AND assignment operator, It adds right operand to the left operand and assign the result to left operand	C += A is equivalent to C = C + A
-=	Subtract AND assignment operator, It subtracts right operand from the left operand and assign the result to left operand	C -= A is equivalent to C = C - A
*=	Multiply AND assignment operator, It multiplies right operand with the left operand and assign the result to left operand	C *= A is equivalent to C = C * A

/=	Divide AND assignment operator, It divides left operand with the right operand and assign the result to left operand	C /= A is equivalent to C = C / A
%=	Modulus AND assignment operator, It takes modulus using two operands and assign the result to left operand	C %= A is equivalent to C = C % A

The Conditional Operator (? :)

There is an oprator called conditional operator. This first evaluates an expression for a true or false v alue and then execute one of the two given statements depending upon the result of the evaluation. The conditioanl operator has this syntax:

Operator	Description	Example
? :	Conditional Expression	If Condition is true ? Then value X : Otherwise value Y

The *typeof* Operator

The *typeof* is a unary operator that is placed before its single operand, which can be of any type. Its value is a string indicating the data type of the operand.
The *typeof* operator evaluates to "number", "string", or "boolean" if its operand is a number, string, or boolean value and returns true or false based on the evaluation.
Here is the list of return values for the *typeof* Operator :

Type	String Returned by typeof
Number	"number"
String	"string"
Boolean	"boolean"
Object	"object"
Function	"function"
Undefined	"undefined"
Null	"object"

CLASS: I B.Sc IT COURSE CODE: 18ITU203 BATCH-2018-2021
COURSE NAME: COMPUTER NETWORKS AND INTERNET TECHNOLOGIES
UNIT: V (Javascript Fundamentals)

POSSIBLE QUESTIONS

PART-B
(Each Question Carries 2 Marks)

1. What is JavaScript?
2. Define Variable?
3. How the javascript is embedded into HTML?
4. What the Datatypes in JavaScript?
5. Define functions in JavaScript?
6. What are the predefined functions in JavaScript?
7. What are the built-in objects in JavaScript?

PART-C
(Each Question Carries 6 Marks)

1. Explain the fundamental concept of Javascript.
2. Explain the various datatypes in JavaScript with example.
3. Discuss about functions in JavaScript.
4. Explain the predefined functions in JavaScript with example/.
5. Explain the events in JavaScript with example.
6. Explain the JavaScript object model
7. Explain built-in objects in JavaScript.
8. Explain about the conditional statements in Javascript with example.
9. Explain about the looping statements in Javascript with example.
10. Explain the operators in JavaScript with example.

KARPAGAM ACADEMY OF HIGHER EDUCATION
COIMBATORE - 21
DEPARTMENT OF COMPUTER SCIENCE,CA & IT
BATCH : 2018-2021
Unit -V Part -A Multiple Choice Questions

Subject: Computer Network **Subject Code:18ITU203**

S.No.	Questions	Choice 1	Choice 2	Choice 3	Choice 4	Answer
1	Why so JavaScript and Java have similar name?	JavaScript is a stripped-down version of Java	JavaScript's syntax is loosely based on Java's	They both originated on the island of Java	Both are developed by the same person	JavaScript's syntax is loosely based on Java's
2	_____ JavaScript is also called client-side JavaScript.	Microsoft	Navigator	LiveWire	Native	Navigator
3	What are variables used for in JavaScript Programs?	Storing numbers, dates, or other values	Varying randomly	Causing high-school algebra flashbacks	Varying sequentially	Storing numbers, dates, or other values
4	_____ JavaScript is also called server-side JavaScript.	Microsoft	Navigator	LiveWire	Native	LiveWire
5	Which of the following are capabilities of functions in JavaScript?	Return a value	Accept parameters and Return a value	Accept parameters	does not return a value	Accept parameters
6	_____ tag is an extension to HTML that can enclose any number of JavaScript statements.	<SCRIPT>	<BODY>	<HEAD>	<TITLE>	<SCRIPT>
7	JavaScript Code is written inside file having extension _____	.javascript	.jsc	.jvs	.js	.js
8	The “var” and “function” are	Keywords	Declaration statements	Datatypes	Prototypes	Declaration statements
9	Which function among the following lets to register a function to be invoked once?	setTimeout( )	setTotaltime( )	setInterval( )	setTime( )	setTimeout( )
10	Which property is used to obtain browser vendor and version information?	modal	version	browser	navigator	navigator
11	The setTimeout( ) belongs to which object?	Element	Window	Location	control	Window
12	To which object does the location property belong?	Window	Position	Element	Location	Window

13	Which method receives the return value of setTimeout( ) to cancel future invocations?	clearTimeout( )	clearInterval( )	clearSchedule( )	cancelTimeOut( )	clearTimeout( )
14	What is the return type of standard JavaScript objects?	xml	object	DOM	html	object
15	JavaScript code between a pair of “script” tags are called _____	Non-inline	External	Referenced	Inline	Inline
16	When does JavaScript code appear inline within an HTML file?	Between the “script” tag	Outside the “script” tag	Outside the “Javascript” tag	Outside the “javascript” tag	Between the “script” tag
17	The JavaScript’s syntax calling a function or	Primary	Functional	Invocation	Property Access	Invocation
18	What kind of an expression is “new Point(2,3)”?	Primary Expression	Object Creation	Constructor Calling Expression	Invocation Expression	Object Creation Expression
19	Which of the operator is used to test if a particular property exists or not?	in	exist	within	between	in
20	The script tag must be placed in	head	head and body	title and head	title	head and body
21	Which function among the following lets to register a function to be invoked once?	setTimeout( )	setTotaltime( )	setInterval( )	setTime( )	setTimeout( )
22	Which property is used to obtain browser vendor and version information?	modal	version	browser	navigator	navigator
23	The setTimeout( ) belongs to which object?	Element	Window	Location	control	Window
24	To which object does the location property belong?	Window	Position	Element	Location	Window
25	Which method receives the return value of setTimeout( ) to cancel future invocations?	clearTimeout( )	clearInterval( )	clearSchedule( )	cancelTimeOut( )	clearTimeout( )
26	_____ event is fired every time the web application is stopped.	OnEnd	OnStart	OnPause	OnStop	OnEnd
27	_____ is the property of session object that identifies the current session	Session ID	Session	Application ID	ObjectID	Session ID
28	_____ is the method which Gets and displays a content string	ChooseContent	Choosecontent	ChooseCnt	ChooseCollection	ChooseContent
29	_____ is the method which Moves a specified file from one location to another	move()	mov	Moves()	Match()	move()

30	_____ is the method which Returns a Folder object for a specified path	GetFolder	Folder	getFolder	folder	GetFolder
31	_____ is the property of drive object which Returns the total size of a specified	AvailableSpace	TotalSpace	TotalSize	Space	TotalSize
32	_____ is the method which Copies a specified file from one location to another	Copy()	copy()	cpy()	Copied()	Copy()
33	_____ is the method which Retrieves and displays all of the content strings in the text file	GetAllContent	GetallContent	GetContent	GetActivate	GetAllContent
34	_____ is used to return information about a specified file.	The Drive	The Folder Object	The File object	The Directories Object	The File object
35	_____ is used to store and access variables from any page	Requst Object	The Application object	Session Object	The File object	The Application object
36	_____ is the method which Deletes a specified file	Delete	Del	Deletefile	Dele	Delete
37	A conditional expression is also called a	Alternate to if-[illegible]	Immediate if	If-then-else	switch statement	Immediate if
38	A statement block is a _____	conditional [illegible]	block that [illegible]	block that contains [illegible]	block that [illegible]	block that [illegible]
39	A _____ object is a reference to one of the classes in a Java package, such as	JavaArray	JavaClass	JavaObject	JavaPackage	JavaClass
40	_____ is a wrapped Java array, accessed from within JavaScript code.	JavaArray	JavaClass	JavaObject	JavaPackage	JavaArray
41	When a JavaScript object is sent to Java, the runtime engine creates a Java wrapper of type	ScriptObject	JSObject	JavaObject	Jobject	JSObject
42	_____method evaluates a string of JavaScript code in the context of the specified object.	Eval	ParseInt	ParseFloat	Efloat	Eval
43	Which of the following code creates an object?	var book = Object( );	var book = new Object( );	var book = new OBJECT( );	var book = new Book( );	var book = new Object( );
44	Which of the following function of Array object returns a string representing the array and its elements?	toSource( )	sort( )	splice( )	toString( )	toSource( )
45	Which built-in method returns the characters in a string beginning at the specified location?	substr( )	getSubstring( )	slice( )	substring( )	substr( )
46	Which of the following function of String object returns the character at the specified	charAt( )	charCodeAt( )	concat( )	indexOf( )	charAt( )
47	Which of the following code creates an object?	var book = Object( );	var book = new Object( );	var book = new OBJECT( );	var book = new Book( )	var book = new Object( );

48	Which built-in method calls a function for each element in the array?	while( )	loop( )	forEach( )	for( )	forEach( )
49	Which built-in method sorts the elements of an array?	change(order)	order( )	sort( )	arrange( )	sort( )
50	"Add and Assignment" operator is shown by this symbol.	==+	=+	+==	+=	+=
51	"===" operator is _____	Is equal to	s identical (is equal to and is of the same type)	is not equal to	Is identical (is equal to and is of the different type)	s identical (is equal to and is of the same type)
52	"+=" operator can operate on following data values	integert	float	alloptions	string	alloptions
53	Which of the following is not an logical operator	&&	!	||	|	|
54	concatenate two strings.	Comma	Plus	Dot	Arrow	Plus
55	"++" is _____ type of operator.	Binary	Unary	Ternary	bitwise	Unary
56	Which of the following is not a comparison operat	===	>=	++	<=	++
57	Adding String and Integer always results in _____	Character	Integer	String	both string and integer	String
58	assigns a value to a variable based on some condition.	Assignment operator	Logical Operator	Conditional operator	Bitwise Operato	Conditional operator
59	The ternary operator used in the following statement:marks = (mark<35)?"Fail":"Pass";	Bitwise Operator	Colon Operator	Logical Operator	Conditional Operator	Conditional Operator
60	he …….. operator evaluates to True if its first operand is less than its second operand;	<	>	<=	>=	<