IVC Course Code : 319

COMPUTER SCIENCE & ENGINEERING SECOND YEAR

Intermediate Vocational Course

Paper III : DATA COMMUNICATIONS AND COMPUTER NETWORKS EM

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ROLL No._____

COMPUTER SCIENCE & ENGINEERING

Paper – III

Data Communications And Computer Networks

INDEX

DATA COMMUNICATION

Short Answer Type Questions

1. What is data communication? List types of data communication.

A. Data communication: Data communication is the transmission of electronic data over some media. The media may be cables micro waves or fiber optics. Types of data communications are:

- ✓ Point to point communication
- ✓ Point to multipoint communication   **(Or)**

There are three types of data communication

- ✓ processor to processor
- ✓ personal computer to host computer
- ✓ personal computer to personal computer

2. Write various modes of data transmission.

A. There are three modes of data transmission.

1. Simplex mode
2. Half–duplex mode
3. Full–duplex mode

3. Define bandwidth.

A. Bandwidth: Bandwidth means the amount of data that can be transformed from one point to another in a given time period (usually a second). Bandwidth is usually expressed in bits per second bps or bytes per second (Bps).
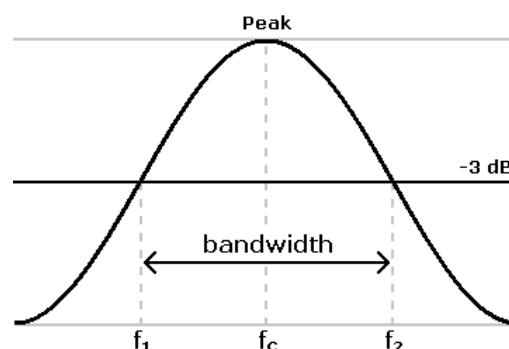
4. List various communication channels.

A. List various communication channels :

   1. Coaxial cable
   2. Twisted pair cable
   3. Microwaves
   4. Fiber optics

5. Write various methods of data transmission.

A. There are Three various methods of data transmission

   1. Synchronous Transmission
   2. Asynchronous Data Transmission
   3. Isochronous Data Transmission

6. Write various forms of data Transmission?

A. There are two forms of data transmission

   1. Analog form
   2. Digital form

7. What is asynchronous data transmission?

A. Asynchronous data transmission:

Bites in an Asynchronous data stream can be transferred at random interval and the data rate of the stream is not required to be constant. asynchronous system use a start bit to signal the beginning of a data transmission. A stop bit is used to signal the end of a data transmission. Asynchronous data transfer system usually have an error detection mechanism. If an error is detected the data can be resent.
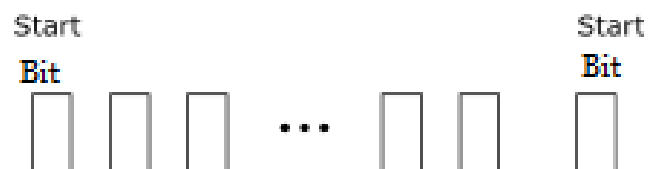
8. What is parallel and serial interface?

A. Parallel Interface : A parallel interface refers to a multiline channel, each line capable of transmitting several bits of data simultaneously.
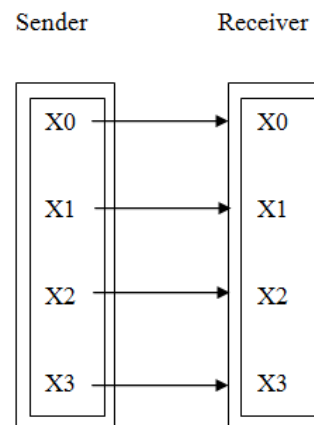
Parallel interface(4 bits)

Serial Interface : A serial interface uses a serial port, a single line capable of only transmitting one bit of data at a time; a computer mouse connection is a good example.
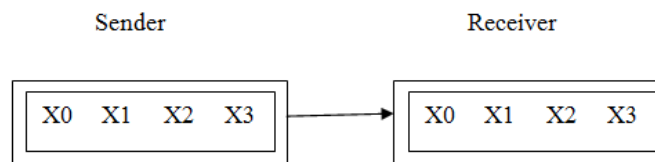
Serial interface(4 bits)

9. What is multiplexing ? Write various types of multiplexing?

A. Multiplexing: Multiplexing is the simultanious tramission of multiple signals over a signle data link.

There are various types of multiplexing

1. Space-Division Multiplexing
2. Frequency-Division Multiplexing (FDM)
3. Time-Division Multiplexing(TDM)
4. Code Division multiplexing (CDM).

1. Explain various types of data communications.

A. There are two types of data communications

   1. Point to point communication

   2. Point to multipoint communication

1.point to point communication:

  point –to point connection refers to a communications connections between two nodes or end points. an example is a telephone call in which one telephone is connected with one other and what is said by one caller can only be heard by the other.
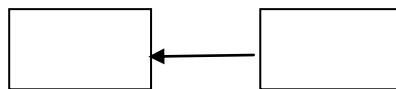
2. point –to–multipoint communication:

point–to multipoint (PMP) communication refers to communication that is accomplished in the form of one to many connections ,offerings several paths from one single location to various locations point-to-multipoint is generally abbreviated as PTMP,P2MP or PMP. Examples of point-to-multipoint communication system are radio and television broadcasting.

  (OR)
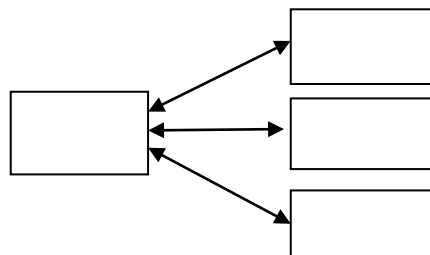
There are three types of Data Communication

    1. Processor To Processor

    2. Personal Computer To Host Computer

    3. Personal Computer To Personal Computer

1. Processor To Processor:

This communication normally refers to the communication between two or more computers to interchange large quantities of data such as bulk update of files or records and so on.

2. Personal Computer To Host Computer:

The personal computer can sends and receives and stores the information from another large computer which is normally the host computer.

3. Personal Computer To Personal Computer:

Normally the personal computer can communicate with each other on a one-to-one basis. They exchange the information freely with one another this communication classified into two communications. They are:

- Online Communication
- Offline Communication

Online Communication:

In this communication a direct connection to mode between the device interchanging information and the tranfer occurs almost instaneously.

Offline Communication:

In this communication, the transfer of information is not immediate. The data is prepard for subsequent transmission.
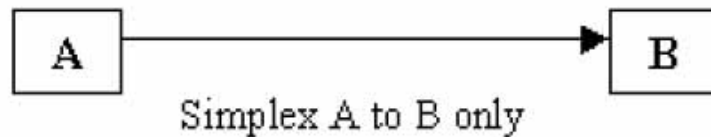
2. Write about transmission modes.

A. **Types of transmission modes:** There are three ways for transmitting data to from one point to another.

1. Simplex
2. Half-duplex
3. Full-duplex

1. Simplex mode:

- In simplex mode the communication is one direction
- One of two devices on a link one can transmit other can only receive
- Example: Radio, T.V., Pager transmission.

Simplex A to B only

2. Half-duplex mode:

- In half-duplex mode each station can both transmitted & receive but not at the same time.
- When one device is sending the other can only receive
- Example is the wireless communication

Half-Duplex A to B or B to A
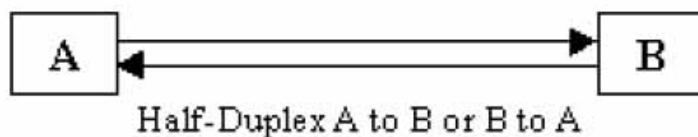
3. Full – duplex mode:

- In full-duplex mode both station can transmit and receive at the same time
- Two people are communicating by a telephone line can talk and listen at the same time
- Example of this mode of transmission is the telephone line.

Full-Duplex A to B and B to A
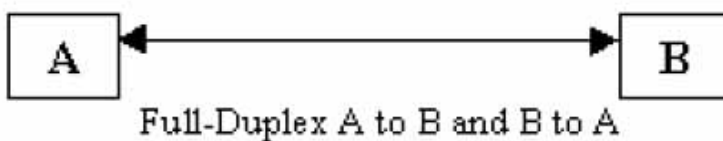
3. **Explain synchronous and asynchronous and isochronous data transmission methods.**

A. These are methods used to transfer streams of data waveform diagram can be used to illustrate these different transmission modes. A wave form diagram shows how the signal might appear on an oscilloscope screen which produces a diagram with voltage on the vertical axis and time on the horizontal axis.

Synchronous Transmission:

➢ Synchronous transmission of data is method in which blocks of at character are transmitted in the sequence.

➢ Synchronous transmission is used direct computer to computer communication for large computer system because of the high data transfer speeds required.
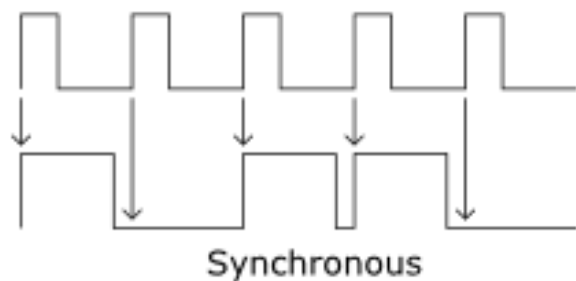
Synchronous

Asynchronous Transmission:

➢ In asynchronous transmission one character is transmitted at a time the transfer of data is controlled by start bits and stop bits.

➢ asynchronous transmission is often used to low speed transmission of data in a conjunction with narrow–band and few slower speed voice band channels.

Start Bit ... Start Bit

Asynchronous
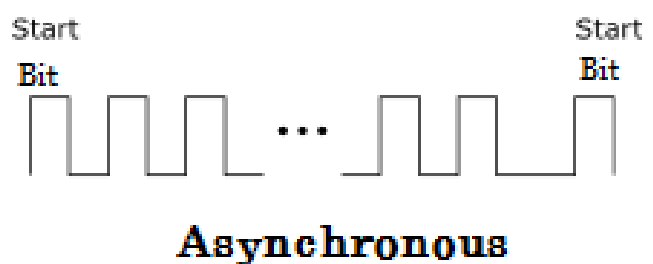
Isochronous Transmission:

➢ Isochronous transmission used constant fixed frequency transmission clock to create set time slots.

➢ A clock signal is generated by a designed network device and passed to all other devices on the network.
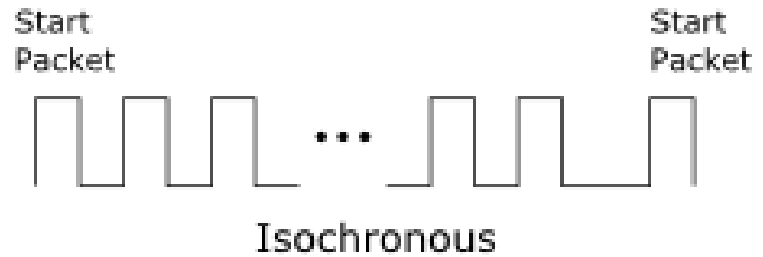
4. Explain various types of multiplexing with neat diagrams.

A. Multiplexing: Multiplexing is the simultanious tramission of multiple signals over a signle data link.

Mulltiplexing can be divided into different basic categories:

1. Space–Division Multiplexing
2. Frequency Division Multiplexing (FDM)
3. Time Division Multiplexing(TDM)
4. Code Division Multiplexing (CDM)

1. Space–Division Multiplexing

• Space–division multiplexing is achieved by multiple antenna elements forming a phased array antenna.

• Space–division multiplexing simply implies different point–to–point wires for different channels.
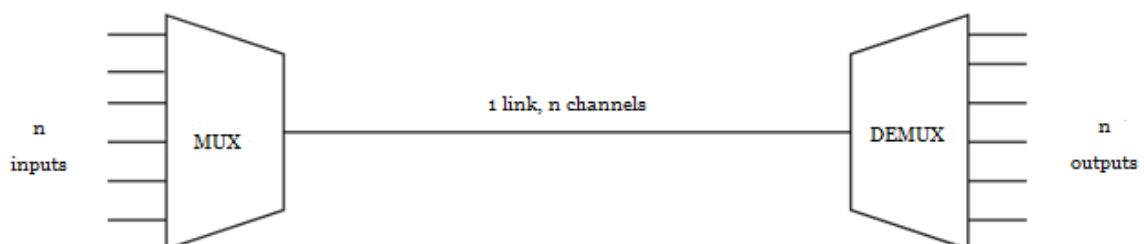
2. Frequency Division Multiplexing (FDM)

In FDM the available frequency spectrum is divided amoung the logical channels, with each user having exclusive possession of some frequency band.

- Frequency Division Multiplexing (FDM) is an analog technique
- Tramission bandwidth is divided in frequency
- FDM uses analog modulation and filitering to multiplex narrow band signals into a broadband channel.
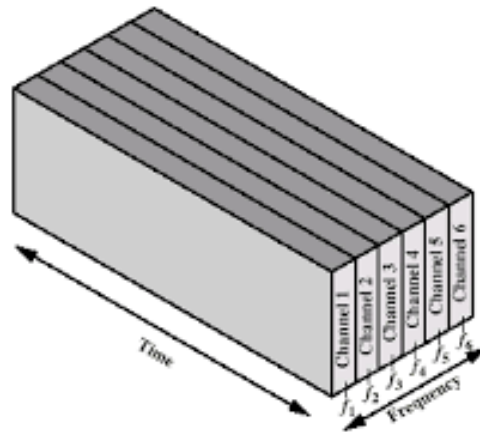
3. Time Division Multiplexing(TDM)

- Time division multiplexing (TDM) is a digital technique
- The available bandwidth is shared on a time slot basis in a round robin fashion
- TDM can be implemented in two ways
  - ✓ Synchronous TDM
  - ✓ Asynchronous TDM
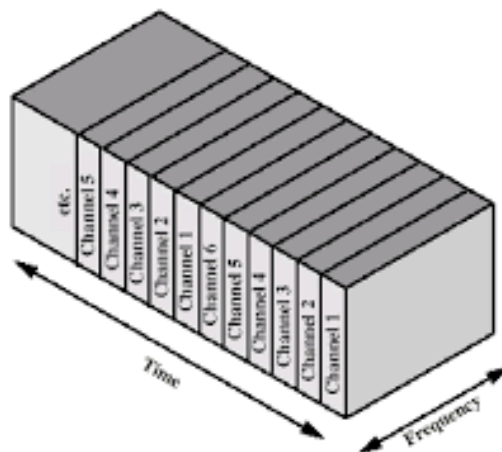
4. Code Division Multiplexing (CDM)

- CDM is also a digital multiplexing technique.
- CDM is used in wireless and fiber optic networks.
- Speed-spectrum communication technique
- Tramittted singal has much wider bandwidth than information signal.
- Application in mobile ratdio systems, wireless LAN's and high-speed optical fiber communication systems.

5. Explain differenet methods of Data transmission.

A. Methods of Data Transmission

Data may be transfer from one device to another by means of some communication media. The electromagnetic or light waves that transfer data from one device to another device in encoded form are called signals. Data transmissions across the network can occur in two forms i.e.:

- ✓ Analog signal.
- ✓ Digital signal.

Analog Signal

The transfer of data in the form of electrical signals or continuous waves is called analog signal or analog data transmission. An analog signal is measured in volts and its frequency is in hertz (Hz).

Analog Signal

Advantages of Analog Signaling

- Allows multiple transmissions across the cable,
- Suffers less from attenuation.

Disadvantages of Analog Signaling

- Suffers from EMI.
- Can only be transmitted in one direction without sophisticated equipment.

Digital Signal

The transfer of data in the form of digit is called digital signal or digital data transmission. Digital signals consist of binary digits 0 & 1. Electrical are used to represent binary digits. Data transmission between computers is in the form of digital signals.

Digital Signal

Advantages of Digital Signaling

- Equipment is cheaper and simpler than analog equipment.
- Signals can be transmitted on a cable bidirectional.
- Digital signals suffer less from EMI.

Disadvantages Digital Signaling

- Only one signal can be sent at a time.
- Digital signals suffer from attenuation.

(OR)

Methods of Data Transmission

Data may be transfer from one device to another by means of some communication media. The electromagnetic or light waves that transfer data from one device to another device in encoded form are called signals. Data transmissions across the network can occur in two forms i.e.:

- ✓ Analog signal.
- ✓ Digital signal.

Analog Data or Analog Signal: The term **analog data** refers about the data which is continuous. **For example,** consider an analog clock which consists of an hour, minute, and second's hands which gives information in continuous form. In that analog clock the movement of the hands are continuous. Analog data, it maybe the sounds made by a human voice, will take continuous values. If someone speaks then, an analog wave will be created in the air, which can be captured by a microphone and can be converted to an analog signal or sampled. It can also be converted to a digital signal.

Digital Data or Digital Signal: The term Digital data refers to information which has distinct states. **For example**, consider a digital clock that reports the values of hours and minutes when they change suddenly from 9:10 to 9:11. Digital data will take distinct values only. For example, Consider the data storage in our computer, data will be stored in the form of Os (zeros) and 1s(ones). If we want to transmit that data across the medium first we have to convert that digital data to a digital signal or it can be modulated into an analog signal.

Analog and Digital Signals:

Signals can either be analog or digital. An analog signal will have infinitely numerous levels of intensity over a period of time. As the analog wave transfers from value A to value B, it has to pass through and will include an infinite number of values in its path. Unlike analog signal, Digital signal will have only a limited number of defined values. Even though each value is any number, it is as simple as 1 and 0 (digital data represented in 0 or 1). One of the simplest ways to represent this digital signal is by plotting them on a graph paper consisting of a pair of perpendicular axes. The vertical axis in the graph represents the values of signal or the strength of a signal, whereas the horizontal axis in the graph represents time. The figure given below illustrates both analog

signal and a digital signal. The curve in the analog signal has to pass through an endless number of points, whereas the vertical lines of the digital signal, illustrate the sudden jump which the signal will makes from value to value.

a. Analog signal   b. Digital signal
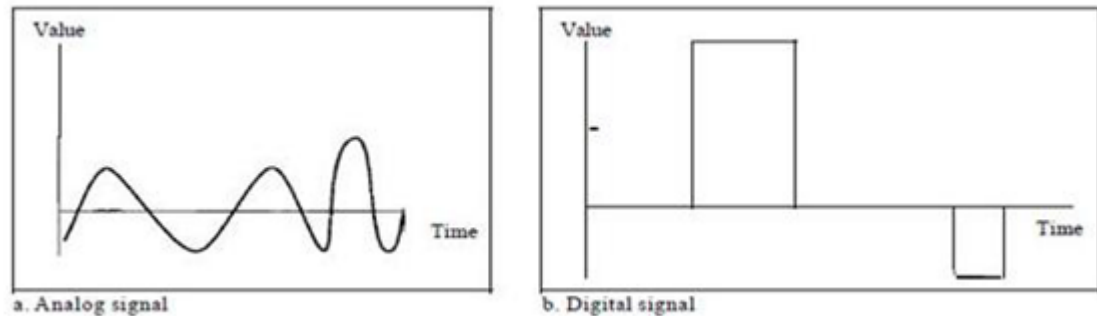
6. Explain about various communication channels

A. The communication channels are

      1. Coaxial cable   2. Twisted pair   3. Microwaves   4. Fiber optics

1. Coaxial cable:

- Coaxial cable, also known as coax cable, is a type of cable that is used for transmitting high-frequency electrical signals.
- It consists of a copper conductor that is surrounded by a layer of insulation, a braided shield, and an outer jacket.
- Coaxial cable is commonly used for applications such as cable television, satellite television, and high-speed internet connections.
- It is also used in other applications that require high-speed data transmission, such as security cameras, home automation systems, and industrial control systems.
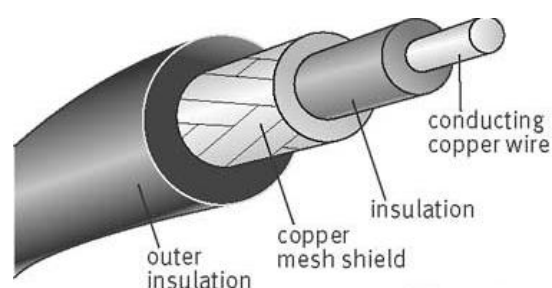
2. Twisted pair cable:

- A twisted pair consists of two insulated copper wires typically about 1mm thick. The wires are twisted together in a helical form.
- The purpose of twisting the wires is to reduce electrical interference (EMI) and crosstalk between the wires.
- Twisted pair is the ordinary copper wire that connects home and many business computers to the telephone communication.
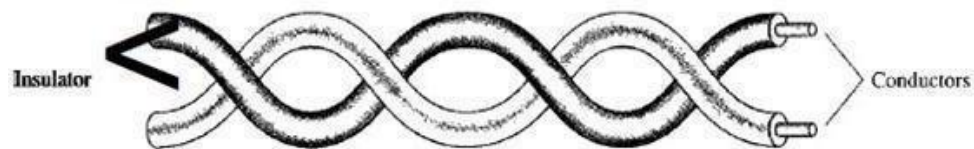
3.Microwaves:

- Microwave communication is a form of wireless communication that uses high-frequency radio waves to transmit information between two or more locations.
- These radio waves have wave lengths that range from approximately 1 millimeter to 1 meter, and frequencies between 300 MHz to 300 GHz.
- Microwave communication is used for a variety of purposes, including satellite communication, television & radio broad casting, cellular communication, and microwave links for point-to-point communication.
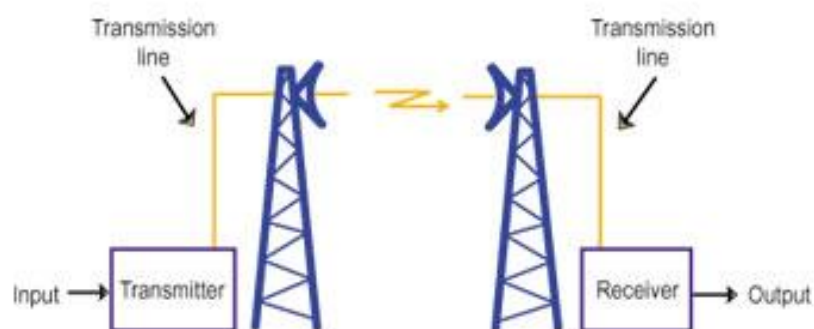
4. Optical Fiber Cable:

- Optical fiber cable is a type of cable made up of thin strands of glass or plastic fibers that are used to transmit data, voice, and video signals over long distances.

- The cable consists of a core, cladding, and coating, and works by transmitting light signals through the core, which reflects off the cladding and travels through the cable.
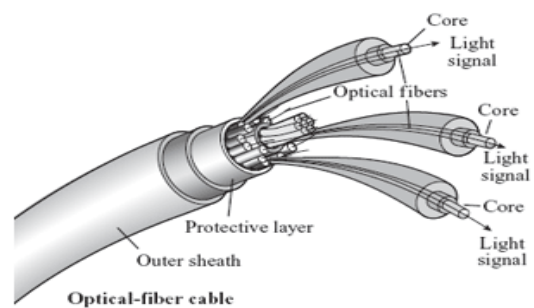
UNIT–II

NETWORK TYPES AND TOPOLOGIES

Short Answer Type Questions

1.What is a Network?

A. Network: A computer network is a group of computer systems and other hardware devices that are link together throughcommunication channels to facilitate communication and resource sharing among a wide range of users.

2. What is Internet?

A. Internet: The internet is the publicly available worldwide system of interconnected computer networks that transmit data by packet switching over the internet protocol(IP). It is made up of thousands of other, smaller business, academic and government network.

3. What is www?

A. WWW: The world wide web (WWW), commonly known as the web is an information system where documents and other web resource are identified by uniform resource locators (URLS, such as https://exemple. com) which may be interlinked by hypertext, and are accessible over the internet.

4. Write various advantages of networks?

A. Various advantages of networks: Networking of computers facilitates resource sharing, sharing of information, and can be used as a communication medium, and also for backup and support.

5. List various disadvantages of network?

A. List various disadvantages of network:

1. Security must be maintained to avoid unauthorized access.
2. There is a cause to affect viruses.
3. Expensive because of hardware components hubs, cables, routers, NIC, etc... 4. If server is down than the entire network is useless.

6. List various types of network?

A. List various types of network:

     1. Local area networks (LAN)

     2. Metropolitan area networks(MAN)

     3. Wide area networks (WAN)

     4. The internet

7. Expand LAN,WAN,MAN?

A.   **LAN** : Local area network

       WAN : Wide area network

       MAN : Metropolitan network

8. Expand BBN,GAN ?

A.   **BBN** : Back bone network

       GAN : Global area network

9. What is network topology ? list type of topologies ?

A. **Network topology** defines how the computers, or nodes, within the network are physically arranged and connected to each other.

  Types of topology :   1. Star topology

                             2.Ring topology

                             3. Line topology

                             4. Bus topology

                             5. Tree topology

                             6. Mesh topology

10. Write any two advantages and two disadvantages of topologies?

A. Advantages:

  1. We can choose the type of topology as per the requirement.

  2. All devices are connected to the transmission medium as Back Bone.

  Disadvantages:

  1. Defective communication media con not be identified easily.

  2. Expensive

1. Explain different types of computer networks.

A. Different types of computer networks depending upon the geographical area covered by a network, it is classified as:

1. Local Area Networks (LAN)
2. Personal Area Networks (PAN)
3. Home Area Networks (HAN)
4. Metropolitan Area Networks (MAN)
5. Wide Area Networks (WAN)
6. Campus Networks
7. Backbone Networks (BBN)
8. Global Area Networks (GAN)
9. SAN (Storage Area Network)
10. EPN (Enterprise Private Network)
11. VPN (Virtual Private Network)
12. The Internet

1. **LAN (Local Area Net work):** A LAN is a network that is used for communicating among computer devices usually within an office building or home.

   ➢ Is limited in size, typically spanning a few hundred meters, and no more than a mile
   ➢ Is fast with speeds from 10 Mbps to 10Gbps
   ➢ Has lower cost compared to MAN's or WAN's

2. **PAN(Personal Area Network):** A personal area network (PAN) is a computer network used for communication among computer devices, including telephones and personal digital assistants, in proximity to an individual's body.

- A PAN is a network that is used for communication among computers and computer devices (including telephones) in close proximity of around a few meters within a room.
- The devices may or not belong to the person in question.

  The reach of a PAN is typically a few meters .

3. Home area network (HAN):

- A Home Area Network (HAN) is a network contained within a user's home that connects a person's digital devices, from multiple computers and their peripheral devices to telephones, VCRS, television, video games, home security systems, smart appliances, fax machines and other digital devices that are wired into the network.

4. Metropolitan area network :

- It was introduced in 1980's. It is also known as man and uses the same technology as LAN.
- It is developed to extend its coverage over the enter city.
- It is mainly handled and operated by single private company.

5. WAN (Wide Area Network):

- WAN covers a large geographic area such as country, continent or even whole of the world.
- A WAN is two or more LANs connected together. To cover great distances, WANs may transmit data over leased high-speed phone lines or wireless link such as satellites .
- Multiple LANs can be connect together using devices such as bridges, routers or gateways, which enable them to share data.
- The world 's most popular WAN is the internet .

6. Campus network:

➢ A computers network is a computer network made up of an interconnection of local area networks (LAN's) within a limited geographical area.

➢ The networking equipments switches, routers) and transmission media (optical fiber, copper plant, cat5 cabling etc.) are almost enterly owned (by the campus tenant/owner: an enterprice, university, government etc.).

7. Backbone network :

➢ A Back Bone Network (BBN) is a part of a computer network communication that interconnection different pieces of network and providing a path the exchange of information between different LANs or sub networks.

8. Global Area Network (GAN):

➢ A Global area network (GAN) is a network used for supporting mobile communication across an arbitrary number of wireless LANs, satellite coverage areas, etc.

➢ The key challenge in mobile communication is handing off the user communications from one local coverage area to another local coverage area.

9. Storage area network(SAN)

➢ This network connects servers directly to devices to store data.

➢ SAN moves storage resources off performance network. So, each server is allowed to access shared storage.

➢ This can involve Fibre-channel connection, similar to Ethernet, to handle high-performance disk storage for application.

10. Enterprise private network(EPN)

It is a computer network built to share computer resources among different sites (suchas production sites, offices and shops) of a business. Some of the advantages of an enterprise private network are:

➢ The messages are secure because they are encrypted.

➢ They help to centralize IT resources.

➢ They enable business continuity.

11. Virtual private network(VPN)

➢ It is an extended private network which spreads over the internet.

➢ Users can send and receive data across shared or public networks.

➢ It uses public wires– usually the internet to connect to a private network usually a company private network.

➢ The benefit of a secure VPN is its level of security to the connected systems, whereas the other network infrastructure alone cannot provide it.

12. The Internet

➢ The Internet is a global system of interconnected governmental, academic, corporate, public, and private computer networks.

➢ It is based on the networking technologies of the Internet Protocol Suite.

➢ It is the successor of the Advanced Research Projects Agency Network (ARPANET) developed by DARPA of the United States Department of Defense.

➢ The Internet is also the communications backbone underlying the World Wide Web (WWW).

2.Explain about Internet.

A. The Internet:

- The internet is a global system of interconnected computer networks.
- It is based on the networking technologies of the inter protocol suite.
- The internet is a worldwide collection of computer networks, cooperating with each other to exchange data using a common software standard.
- Telephone wires and satellite links, internet users can share information in a variety of forms.

  The size, scope and design of the internet n allows users to

  - connect easily through ordinary personal computers and local phone numbers.
  - Exchange electronic mail (E-mail) with friends and colleagues with accounts on the internet.
  - Post information for others to access, and update it frequently
  - Access multimedia information that includes sound, photo graphic images and even video
  - Access diverse perspectives from around the world.

Advantages:

- You have information at your fingertips and you don't even have to know how to spell or know your ABCs. someone out there knows the answers to everything you can think of.
- You can send mail across the world within minutes where snail mail used to take 3-4 days in the statuses and 2 weeks overseas.
- You are connected to a lot of people who have similar interests if you know the right place to find them on the internet. A lot more difficult in person .

Disadvantages:

- You cannot always trust the answers you get over the internet when you are looking for information .

- You spend too much time in front of a machine ,and enough time in front of "real" people. You need a credit card if you want to buy something either to pay a third party sight or to pay direct the company you are interested. In person, you can always pay by cash.
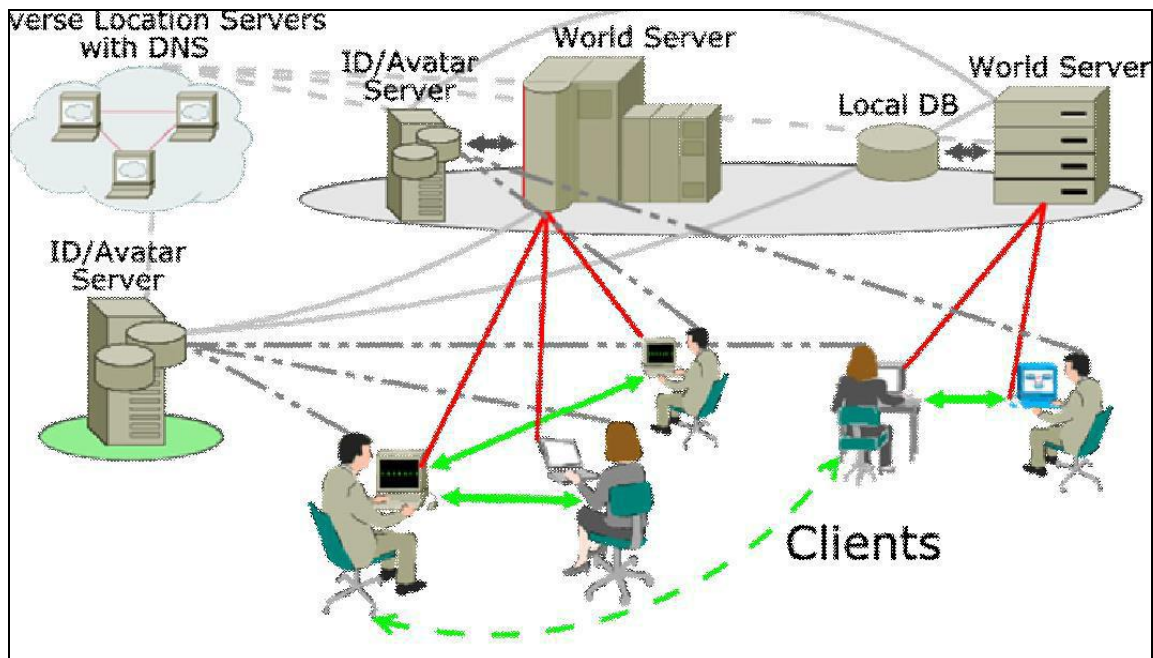
3. Explain about network topologies.

A. some common network topologies include ring, bys, star, tree and mesh configurations. These topologies are deferent below:

Ring Topology:

- In this topology Devices are connected from one to another to form a ring shape .

- Each host is connected to the next and the lost node is connected to the first .

- A data token is used to grant permission for each computer to communicate.

RING TOPOLOGY
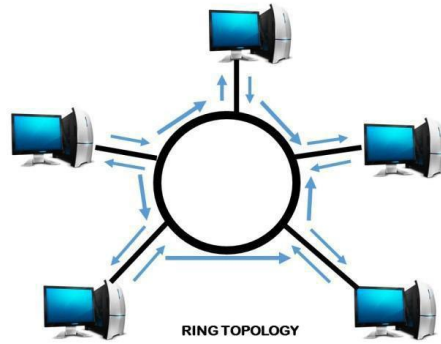
Bus Topology:

- In this topology, all hosts are connected to the backbone cable in a linear fashion .
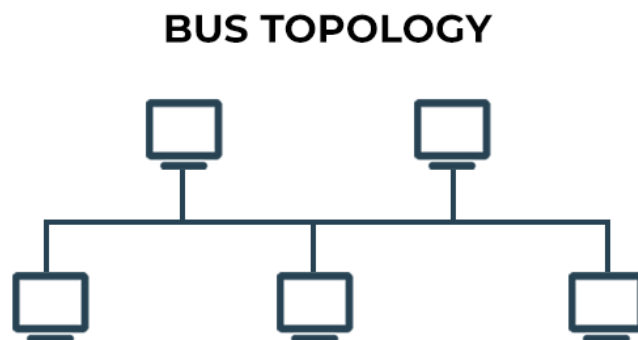
BUS TOPOLOGY

Star Topology:

- In this topology All hosts are connected to a single point of concentration .
- Usually uses a hub or switch as a center node .
- Range limits are about 100 meters from the hub .
- Data on a star network passes through the hub or concentrator before continuing to its destination.
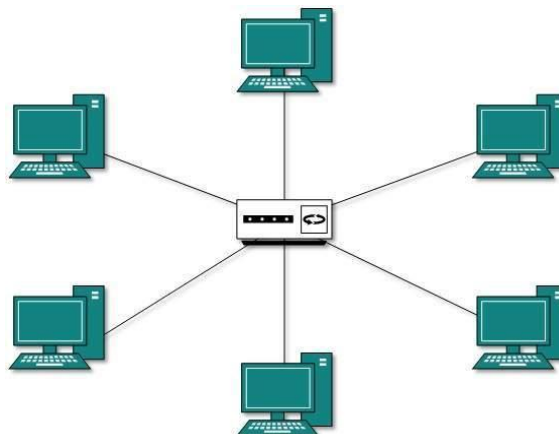
Tree Topology: One "root" node connects to others nodes, which in turn connect to other nodes, forming a tree structure. Information from the root node may have to pass through other nodes to reach the end nodes .

Core Layer

Distribution Layer

Access Layer
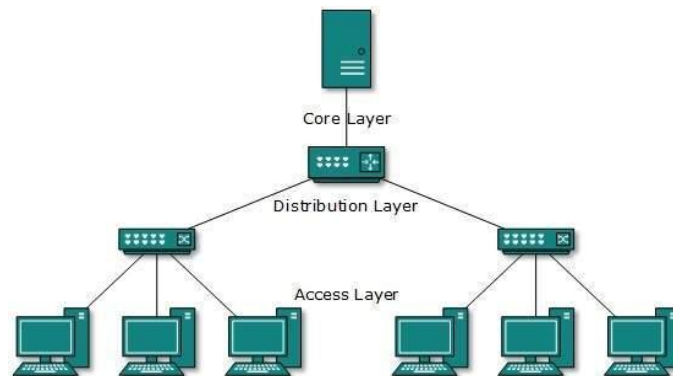
Mesh Topology:

- In this topology, each host is connected to all the other hosts.
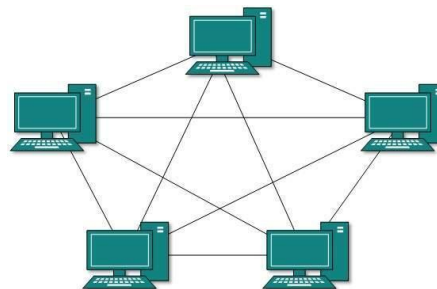
Hybrid Topology:

- Hybrid topology is the collection of two or more different topologies which are discussed above.

- In the below example diagram you can find the star topology, ring topology and the bus topology

HUB
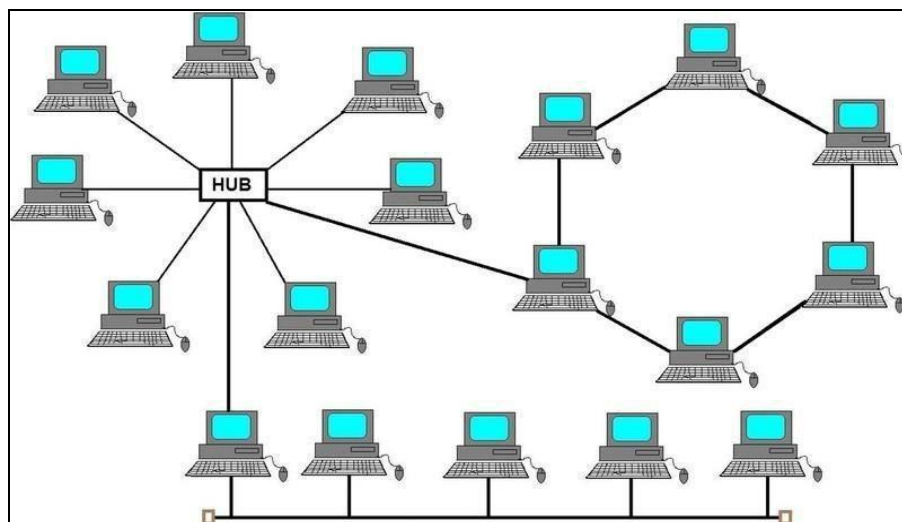
The Internet

- The Internet is a worldwide collection of computer networks, cooperating with each other to exchange data using a common software standard.

- Through telephone wires and satellite links, Internet users can share information in a variety of forms.
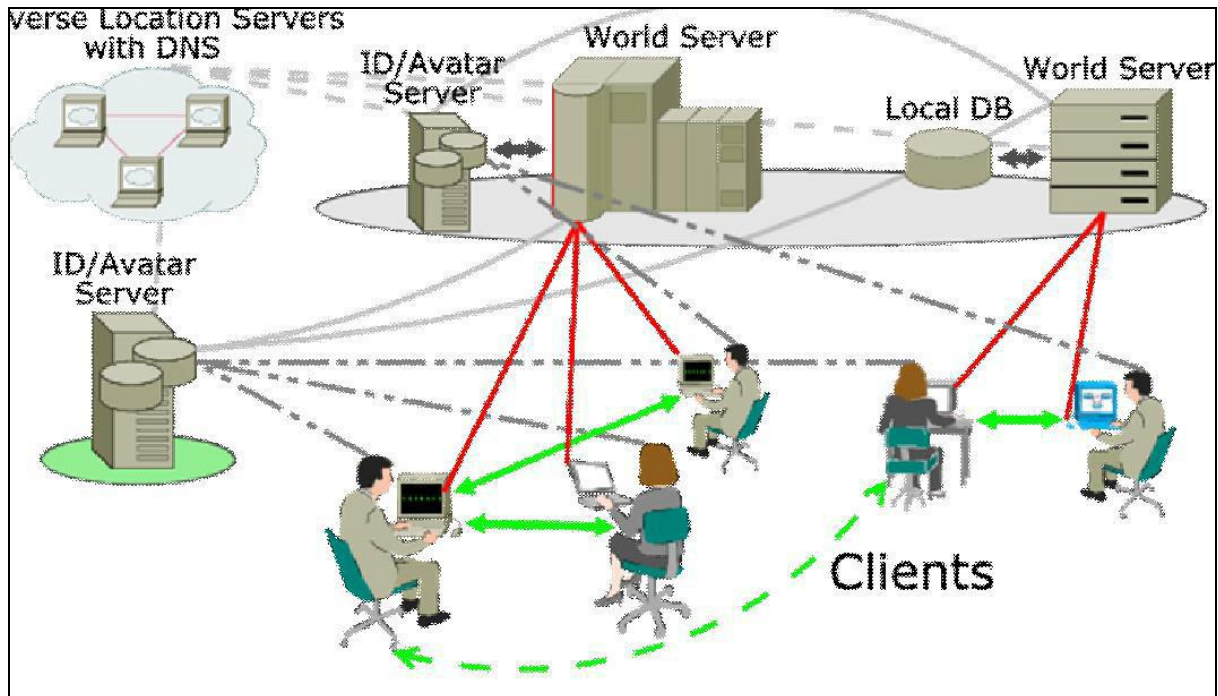
4. Explain advantages and disadvantages of different types of network topology.

A. Ring Topology:

Advantages:

- Easy to install and wire.

- Because every computer is given equal access to the token, no one computer can monopolize the network.

Disadvantages:

- Requires more cable than a bus topology.

- If one computer fail it can affect the whole network.

- It is difficult to identify the problem if the enter network shuts down.

Bus Topology:

Advantages:

- Easy to connect a computer or peripheral.
- Requires less cable length than a star topology.

Disadvantages:

- If there is a break in the backbone cable, the enter network shuts down.
- Both ends of the backbone cable require terminators .
- It is difficult to identify the problem if the enter network shuts down.

Star Topology:

Advantages:

- It is easy to modify and add new computers to a star network without disturbing the rest of the network.
- If one node or workstation (beside the middle node) goes down, the rest of the network will still be functional.
- The center of a star network is a good place to figure out where the network faults are located.
- You can use several cable types in the same network if the hub you have can handle multiple cable types.

Disadvantages:

- Requires more cable than a bus topology.
- If the middle node goes down, then the entire network goes down.
- If is more expensive than because all cables must be connected to one central point.

UNIT–III

LAN COMPONENTS

1. What are LAN Components ?

A. LAN Components: Server, client, hub, switch, repeater, router, NIC, Cables, Network operating system.

2. Write various types of LAN Components.

A. The various types of LAN components are

a) Network Devices such as Servers/clients etc.

b) Network Communication Devices hubs, routers, switches, repeater, etc

c) Network Interface Cards.

d) Cables.

e) Network Operating System.

3. Define Server and Client.

A. Server: A network server is a computer designed to process requests and deliver data to other (client) computers over a local network or the Internet.

Client: A client is a computer that accesses a service made available by a server.

4. What is a file server ?

A. File server : A file server is a computer attached to a network that has the primary purpose for sharing of files (such as documents, sound files, photographs, movies, images, databases, etc.) that can be accessed by the clients.

5. What are Ethernet Cards ?

A. An Ethernet card is one kind of network adapter. These adapters support the Ethernet standard for high speed network connections via cables, Ethernet cards are sometimes known Network Interface Cards (NICs).

6. What are Hubs and Switches ?

A. Hub: A network hub acts as a centralized point for data transmission to computers in a LAN. When data from one computer reaches the hub it is broadcast to every computer in the network regardless of where the data is intended to go.

Switches: An alternative to the network hub is the network switch. Switches represent a newer networking technology that assigns each computer in the network a specific MAC address. This allows LANs using a network switch to route information to individual computers.

7. What is Router ?

A. Router: A Router is a device that forwards data packets along networks. A router is connected to at least two networks, commonly two LANS or WANS or a LAN and its ISP's network. Router reduces network traffic by using routing table.

8. What are Gateways ?

A. Gateways: A gateway is a network element that acts as an entrance point to another network. **For example** an access gateway is a gateway between telephony network and other network such as internet. LANs may have component called gateways, which assists in transferring from one LAN to another LAN.

9. What is a Modem and list types of Modems ?

A. Modem(Modulator-Demodulator): A modem is a device that enables a computer to transmit data over telephone or cable lines. Computer information is stored digitally whereas information transmitted over telephone lines is in the form of analog waves. A modem converts the Digital signals into analog signals (Modulate) and converts the Analog signal into Digital signal (Demodulate).

Types of modems :

- ➤ Internal modem
- ➤ External modem
- ➤ Cable modem
- ➤ DSL modem

10. Write briefly about ATM .

A. **Asynchronous Transfer Mode(ATM)** is a telecommunications concept defined by ANSI and ITU (formerly CCITT) standards for carriage of a complete range of user traffic, including voice, data, and video signals, and is designed to unify telecommunication and computer networks.

11. **What is an adapter ? What is the function of an Adapter ?**

A. **Adapter:** An adapter (Network interface controller, network interface card) is a computer hardware component that connects a computer to a computer network.

Functions of an adapter:

The function of an adapter is to provide a physical link to a computer network. This connection allows computers to communicate with servers, as well as other computers on the network.

12. **List types of Adapters.**

A. **List types of Adapters:**
   1. Host adapter.
   2. Adapter card.
   3. Video adapter.
   4. Bus master adapter.
   5. General purpose interface adapter.
   6. Fax adapter.
   7. Network adapter.
   8. Terminal adapter.

13. What is a multiplexer? Write any two functions of it.

A. Multiplexer: multiplexer makes it possible for several input signals to share one device or resource. **For example** one analog–to–digital converter or one communications transmission medium, instead of having one device per input signal. Multiplexers can also be used to implement Boolean functions of multiple variables.

14. Expand V – SAT, ATM, FTP, EDI.

A.   V–SAT : Very Small Aperture Terminal

          ATM   : Asynchronous Transfer Mode

          FTP   : File Transfer Protocol

          EDI   : Electronic Data Interchange

Long Answer Type Questions

1. Explain briefly about any three LAN Components .

A. LAN components are Cables, Bridge, Modem, Servers/clients, hubs, routers, switches, repeater, Network Interface Cards, Network Operating System, Network Communication Devices.

1. **Bridge:** A Bridge is a networking device which connects multiple LANs and forwards ot filters data packets between them based on therir destination addresss. A bridge prevents unnessary data from crossing connected networks.

2. **Routers** A router is hardware device designed to receive, analyze transfer incoming pockets from one network to another network.

3. **Gateways:** A gateway is a network element that acts as an entrance point to another network.

4. **Modem** : A modem is a device that enables a computer to transmit data over, for example telephone or cable lines.

5. **Network Inferface Cards:** It is a device which plugs into a computer and adapts the network interface to the appropriate standards. The NIC card is used to connect your computer to connect to a network.

6. **Server**: A network server is a computer designed to process requests and deliver data to other (client) computers over a local network or the Internet .

7. **Client**: A client is a computer that accesses a service made available by a server

8. **Hubs**: Hub is a network device. It contains multiple ports. The signal receives at the back bone, it regenerate and transmit all the ports.

2. Explain the function Modem with a neat diagram.

A. Modem(Modulator-Demodulator):

- A modem is a device that enables a computer to transmit data over, **For example** telephone or cable lines.

- Computer information is stored digitally, whereas information transmitted over telephone lines is in the form of analog waves.

- A modem converts the Digital signals into analog signals (Modulate) and converts Analog signal into Digital signal (Demodulate).

- Modem is only device to connect our computer with internet. The following diagram explains how the connections are made.
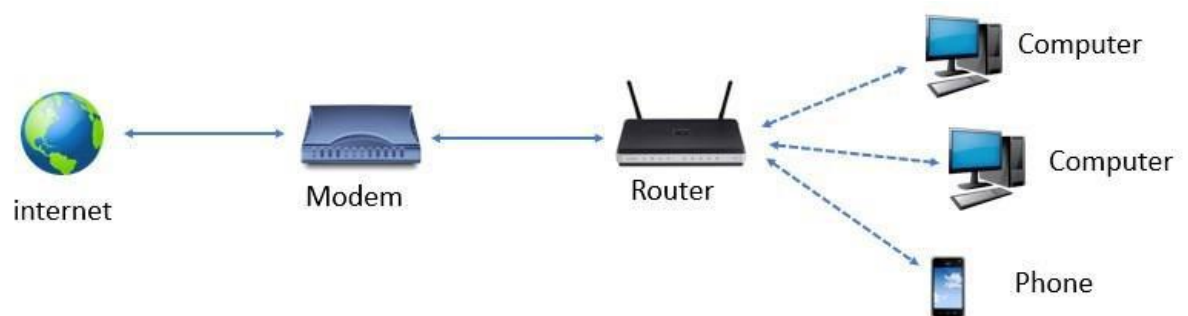
Modems are mainly two types internal modems and external modems

1. **Internal Modems:** Internal modems are basically integrated put up into the PCI slots of the computer. There is need of any external power supply for Internal modems . These modems use the power supply of the PC. Their installation in PC is quite very simple.

2. **External Modems:** A serial cable connection is needed to connect an external modem to a PC. These modems use their own power supplies. These modems have their independent controls. External modems are many types as like Cable modem and DSL modem, etc.,

3. Discuss briefly about Hubs and Switches.

A. Hub :

- A network hub acts as a centralized point for data transmission to computers in LAN.

- When data from one computer reaches the hub it is broadcast to every computer in the network regardless of where the data is intended to go.

- Network bandwidth on LAN using a network hub is shared, which means that four computers on a hub will each go one-quarter the total bandwidth available on the hub.
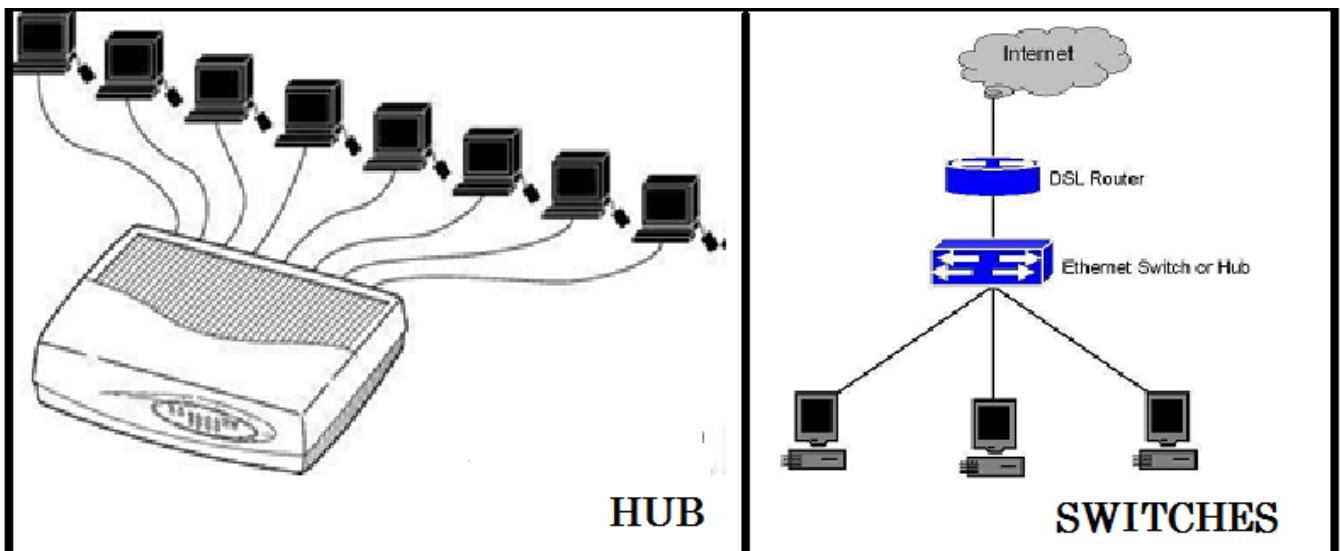
HUB

SWITCHES

Switches:

- An alternative to the network hub is the network switch.

- Switches represent a newer networking technology that assigns each computer in the network a specific MAC address.

- This allows LANs using a network switch to route information to individual computers.

- Because network switches do not broadcast to every computer on the network.
- They can simultaneously allot their full bandwidth to each computer.

4. Explain in detail about V-SAT .

A. A very small aperture terminal (V-SAT)

- **V-SAT** is a two-way satellite ground station or maritime V-SAT antenna with a dish antenna that is smaller than 3 meters.
- The majority of VSAT antennas range from 75 cm to 1.2 m. Data rates typically range from 56 kbit/s up to 4 Mbit/s.
- VSATs access satellite (s) in geosynchronous orbit to relay data from small remote earth stations (terminals) to other terminals (in mesh topology) or master earth station "hubs" (in star topology).
- VSATs are most commonly used to transmit narrowband (point of sale transactions such as credit card polling or RFID data; or SCADA), or broadband data (for the provision of satellite Internet access to remote locations, VolP or video).
- VSATs are also used for transportable, on the-move (utilizing phased array antennas) or mobile maritime communications.
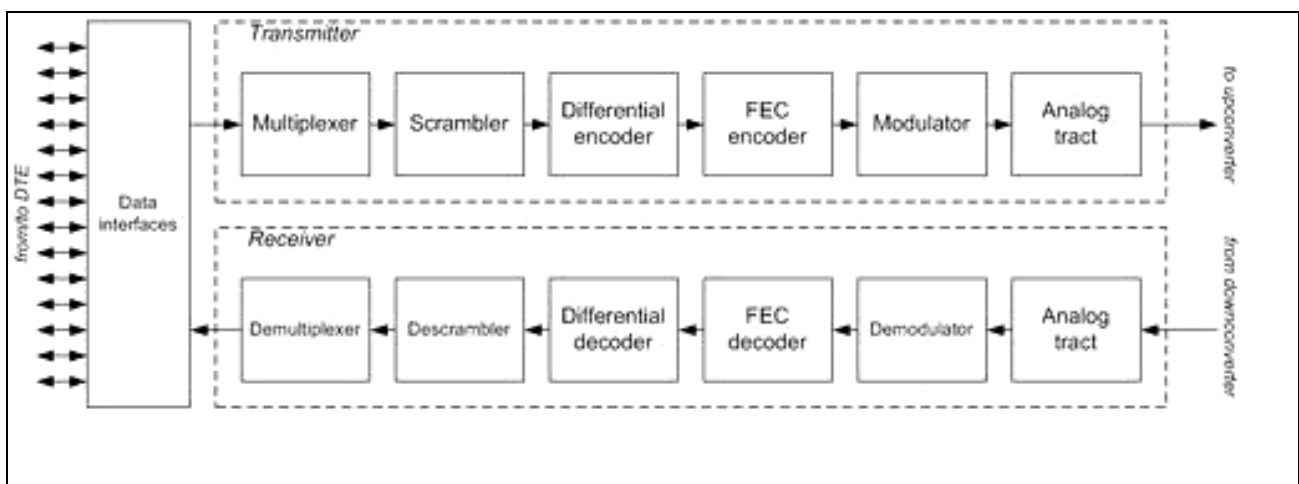
5. Explain in detail about ATM with its layer architecture.

A. ATM Layers:

1. ATM Adaption Layer (AAL):

- ➢ Isolating higher layer protocols from details of ATM processes is done here .

- ➢ It prepares for conversion of user data into cells and segments it into 48-byte cell payloads.

- ➢ AAL protocol excepts transmission from upper layer services and assists them in mapping applications, e.g., voice, data to ATM cells.

2. Physical Layer: It manages the medium dependent transmission. Physical medium dependent sub layer and transmission convergence sub layer are the two parts. Main functions are as follows:

a) It converts cells into a bit stream.

b) It can track the ATM cell boundaries.

c) It controls the transmission and receipt of bits in the physical medium.

d) Looks for the packaging of cells into appropriate type of frames.

3. ATM Layer:

- ➢ Transmission, switching , congestion control , cell header processing sequential delivery, etc., is done in this layer.

- ➢ It is responsible for simultaneously sharing the virtual circuits over the physical link known as multiplexing ATM.
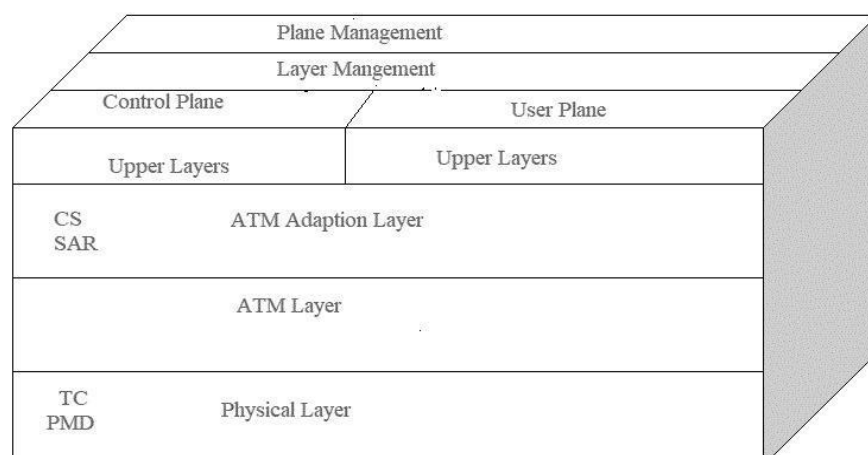
6. Discuss about (a) Routers, (b) Gateways.

A. Router:

➢ A router is hardware device designed to receive, analyze transfer incoming pockets from one network to another network.

➢ It can also be used to convert the packets to another network interface, drop them, and perform other actions relating to a network.

➢ Router reduces network traffic by using routing table.
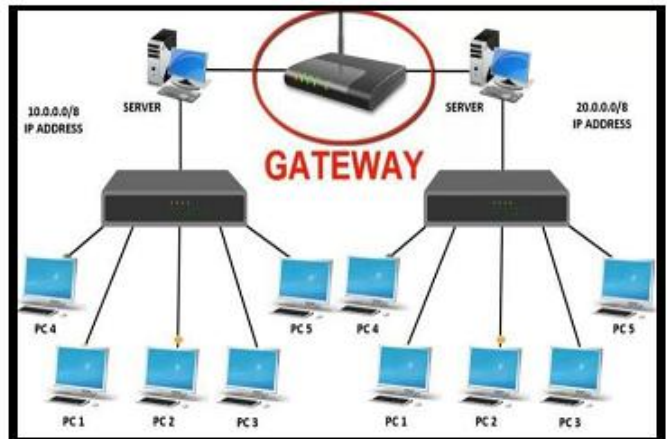
a) ROUTER   b) GATEWAY

Gateway:

➢ A gateway is a network element that acts as an entrance point to another network.

➢ **For example** an access gateway is a gateway between telephony network and other network such as internet .

➢ LANs may have component called gateways, which assists in transferring from one LAN to another LAN.

➢ A gateway is generally a work station or server.

➢ It is a two-way path between networks.

➢ It is used to connect different types of networks.

> Gateway is a work station by which we can make our connection between external network and internal network.

> Gateway belongs to transport layer and application layer of the OSI model.

> Gateways also connect the two networks even if the protocols are different. So protocol conversion is also done by gateways.

7. Explain in detail about hubs and its types .

A. Types of Network Hubs: We have three types of network hubs :

1. Passive hubs
2. Active hubs
3. Intelligent hubs

1. **Passive hubs :**
   - Simply these types of hubs are only used to establish the connection between any two devices
   - They simply receive the signal and then forward it to other devices, without amplifying or regenerating.

2. **Active hubs:**
   - These hubs have an advantage as they amplify the incoming signal before sending to the multiple devices.
   - If these hubs receive a weak signal for rebroadcasting they apply resynchronization and retiming techniques. These are also known as Multiport Repeaters.

3. **Intelligent hubs:**
   - These hubs can act as both passive and active hubs and it also includes remote management capabilities.
   - They can also perform some other tasks like Bridging and routing.

COMPUTER NETWORKS

Short Answer Type Questions

1.What is computer Network ?

A. **Computer network**: A computer network is a group of computer systems and other hardware devices that are linked together through communication channels to facilitate communication and resource sharing among a wide range of users

2. What is Protocol ?

A. **Protocol**: A network protocol defines rules and conventions for communication between network devices.

3. Expand the terms OSI,TCP/IP,FTAM,SMTP,FTP,HTTP,SNMP,ISDN .

A.   **OSI** – Open Systems Interconnection

   TCP/IP – Transmission Control Protocol or Internet Protocol.

   FTAM– File Transfer Access Management

   SMTP– Simple Mail Transfer Protocol

   FTP– File Transfer Protocol

   HTTP– Hyper Text Transfer Protocol

   SNMP –Simple Network Management Protocol

   ISDN– Integrated Services Digital Network

4. What is Firewall ?

A. **Firewall:** A Firewall is software that is used to   provide the security of a private network. It prevents unauthorized access to private networks connected to the network.

5. List the layers of OSI Reference Model .

A. List the layers of OSI Reference Model:

> ➢ Layer 7 – Application layer
>
> ➢ Layer 6 – Presentation layer
>
> ➢ Layer 5 – Session layer

> Layer 4 – Transport layer

> Layer 3 – Network layer

> Layer 2 – Data Link layer

> Layer 1 – Physical layer

6. List the layers of TCP/IP Reference Model .

A. List the layers of TCP/IP Reference Model:

> Application Layer

> Transport Layer

> Inernet Layer

> Network Layer

Long Answer Type Questions

1. Explain OSI Reference Model in detail .

A.OSI Model: Open System Interconnect is an open standard for all communication systems. OSI model is established by International Standard Organization (ISO). This model has seven layers:
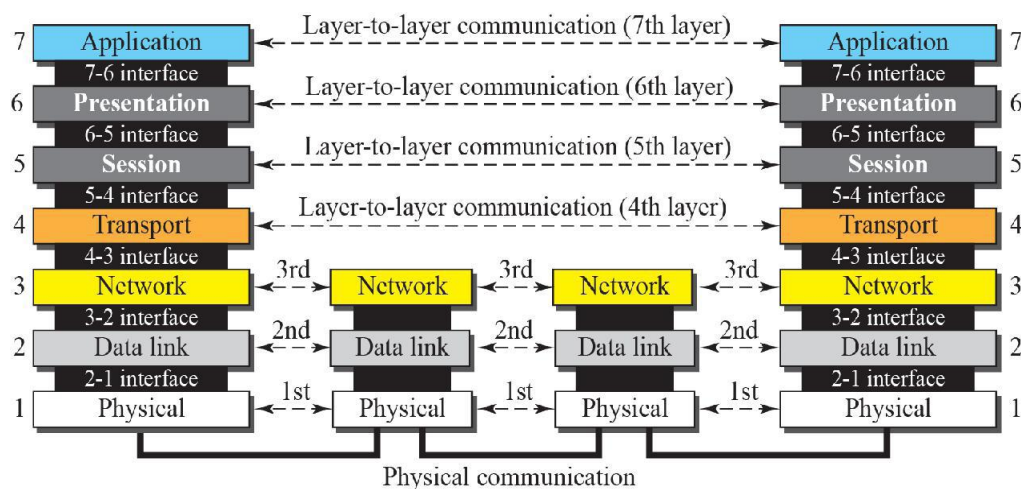
1. **Application Layer**: This layer is responsible for providing interface to the application user. This layer encompasses protocols which directly interact with the user.

2. **Presentation Layer:** This layer defines how data in the native format of remote host should be presented in the native format of host.

3. **Session Layer:** This layer maintains sessions between remote hosts. For example, once user/password authentication is done, the remote host maintains this session for a while and does not ask for authentication again in that time span.

4. **Transport Layer:** This layer is responsible for end-to-end delivery between hosts.

5. **Network Layer:** This layer is responsible for address assignment and uniquely addressing hosts in a network.

6. **Data Link Layer:** This layer is responsible for reading and writing data from and onto the line. Link errors are detected at this layer.

7. **Physical Layer:** This layer defines the hardware, cabling, wiring, power output, pulse rate etc.

2. Explain TCP / IP Reference Model in detail.

A. TCP / IP Reference Model:

TCP stands for Transmission Control Protocol and IP stands for Internet Protocol. The four layers in the TCP/IP protocol suite are :
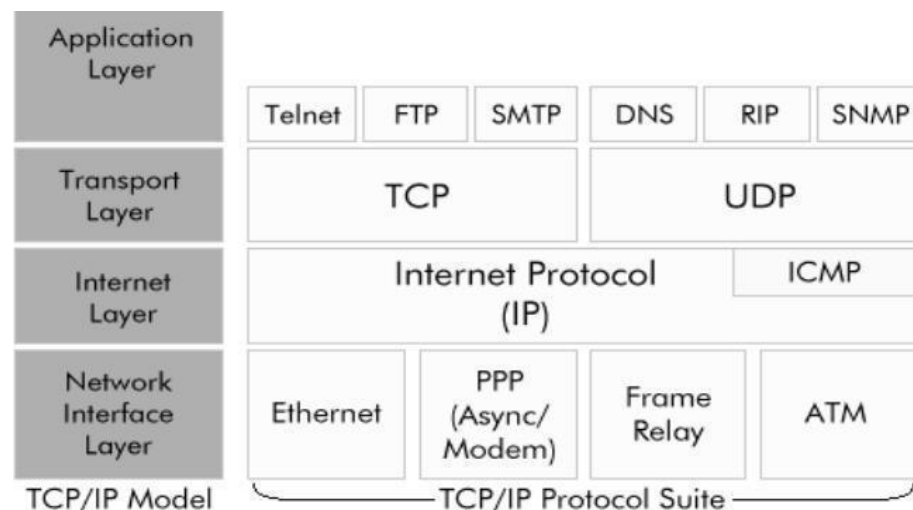
1. **Host-to- Network Layer :** It is the lowest layer that is concerned with the physical transmission of data. TCP/IP does not specifically define any protocol here but supports all the standard protocols.

2. **Internet Layer** : It defines the protocols for logical transmission of data over the network. The main protocol in this layer is Internet Protocol (IP) and it is supported by the protocols ICMP, IGMP, RARP, and ARP.

3. **Transport Layer** : It is responsible for error-free end-to-end delivery of data. The protocols defined here are Transmission Control Protocol (TCP) and User Datagram Protocol (UDP).

4. **Application Layer** : This is the topmost layer and defines the interface of host programs with the transport layer services. This layer includes all high-level protocols like Telnet, DNS, HTTP, FTP, SMTP, etc.

UNIT–V

INTERNET CONNECTIVITY AND SERVICES

Short Answer Type Questions

1. What is an Internet ?

A. **Internet:** An interconnected system of networks that connects computers around the world via the TCP/IP protocol.

2. Write advantages of Internet.

A. **Advantages of Internet:** Internet provides E-Mail , information, online banking, chatting, buy or sell products Downloading softwares etc.

3. What is a Browser? List types of browsers .

A. **Browser**: A browser is software that is used to access the internet. Types browsers are Google chrome, Mozilla Firefox, Internet explorer, Netscape navigator and opera etc.,

4. What is a Message?

A. **Message**: A message is a string of bytes that is meaningful to the applications that use it. Messages are used to transfer information from one application program to another.

5. What is an E-mail?

A. E – mail (Electronic Mail) is an electronic version of sending a letter . You can send e-mail from your computer at any time of the day to any address around the world and your electronic letter will arrive at its destination seconds after you send it, even if the receiver lives on the other side of the world .

6. Write any four uses of E-mail .

A. Uses of E-Mail are

1. Fast: Messages can be sent anywhere around the world in an instant

2. Inexpensive: Transmission usually costs nothing, or at the most, very little.

3. Simple: Easy to use, after initial setup.

4. Efficient: Sending to a group can be done in one step

5. Versatile: Pictures, power-points or other files can be sent too

6. Printable: The hand copy is easy to obtain. We can correspond and save e-mail message and also we get electronic copy of message.

7. What is an attachment?

A. An attachment: An attachment is simply an additional file sent with an email message. An attachment can be an image file, a Word document , or one of many other supported file types.

8. What is voice messaging?

A. Voice messaging: Voice message refers to a message that could be sent to a destination using voice media . Voice itself could be 'packaged' and sent through the IP backbone so that it reaches its marked 'address'.

9. What is Internet Explorer?

A. Internet Explorer is a web browser and it was developed by Microsoft.

10. What is FTP ?

A. FTP: File Transfer Protocol, or FTP, is a protocol used for transferring files from one computer to another typically from your computer to a web server.

11. What is a Protocol and Write types of Network Protocols?

A. A **network protocol** defines rules and conventions for communication between network devices Protocols for computer networking all generally use packet switching techniques send and receive messages in the form of packets . There are different types of network protocols are used for different purposes like

> FTP (File Transfer Protocol)
> HTTP (Hyper Text Transfer Protocol)
> TCP (Transmission Control Protocol)
> UDP (User Datagram Protocol)
> IP (Internet Protocol)

12. What is Internet Security ?

A. Internet Security: Internet security is a protection to the computer and files stored in it, from any harmful and malicious spyware through internet. There are many antivirus software available to protect computers and files .

13. What is a virus ?

A. Virus: A Virus is a piece of software that can infect other programs by modifying them the modification includes a copy of the virus program which can then go on to infect other programs.

14. What is a Trojan ?

A. Trojan: A Trojan is a malicious application that tricks as a authentic file or helpful program but whose real purpose is, **For example** to grant a hacker unauthorized access to a computer. Trojan horses may steal information , or harm their host computer systems.

15. What is Hacking ?

A. Hacking: Hacking is an activity that is used by a hacker to steal the information from any of the device or computer system. Also a hacker can use the system to work as a server to route the information for the own purpose. Hackers can use the contact information of system and send spam emails to that email ids .

16. What is a Worm ?

A. Worm: A worm is a program that can replicate itself and send copies from computer to computer across network connections. Upon arrival, the worm may be activated to replicate and propagate again. A worm actively seeks out more machines to infect and each machine that is infected serves as an automated launching pad for attacks on other machines .

17. Expand FTP, E-Mail, WWW, TCP/IP.

A.   **FTP** : File Transfer Protocol

E-Mail : Electronic Mail

WWW: World Wide Web

TCP/IP: Transmission Control Protocol/Internet Protocol

18. Expand ISDN , HTTP , FTP , NIC.

A.   **ISDN** : Integrated Services Digital Network .

HTTP : Hyper Text Transfer Protocol .

FTP : File Transfer Protocol .

NIC : Network Interface card .

19. What is Firewall ?

A. Firewall: A Firewall is software that is used to provide the security of a private network. It prevents unauthorized access to private networks connected to the network.

1. **What is an Internet? Explain any three advantages and three disadvantages of Internet.**

A. Internet : An interconnected system of networks that connects computers around the world via the TCP/IP protocol.

Advantages of Internet:

1. **Email:** E-mail is an online correspondence system. With e-mail you can send and receive instant electronic messages, which works like writing letters. Your messages are delivered instantly to people anywhere in the world, unlike traditional mail that takes a lot of time. Email is now an essential communication tools in business. It is also excellent for keeping in touch with family and friends. The advantages to email is that it is free (no charge per use) when compared to telephone , fax and postal services.

2. **Information:** Any kind of information on any topic under the sun is available on the Internet. The 'search engines' on the Internet can help you to find data on any subject that you need. There is a huge amount of information available on the internet for just about every subject known to man, ranging from government law and services trade fairs and conferences, market information, new ideas and technical support .

3. **Services:** Many services are now provided on the internet such as online banking, job seeking and applications, railway reservations, flight reservations and hotel reservations etc.

Disadvantages of Internet:

1.**Personal Information:**If you use the Internet, your personal information such as your name, address, etc. can be accessed other people. If you use a credit card to shop online, then your credit card information can also be ' stolen ' which is same as giving a blank check someone.

2. **Pornography:** This is a very serious issue concerning the Internet , especially when it comes to young children. There are thousands of pornographic sites on the Internet which are harmful to the young children .

3. **Spamming:** This refers to sending unsolicited e – mails in bulk , which serve no purpose and unnecessarily clog up the entire system. Such illegal activities are frustrating for all Internet users, and so instead of just ignoring it, we should make an effort to try and stop these activities so that using the Internet can become that much safer.

2 Explain various Web Browsers .

A. Web Browsers

1. **Internet Explorer:** It was developed by Microsoft in 1994 and released in 1995 as a supportive package to Microsoft Windows line of operating systems. which have some enhanced capabilities. IE has come up a preview release of Internet Explorer 11.

Features: There are regular Microsoft updates that IE supports.

It supports Integrated Windows Authentication.

2. **Mozilla Firefox:** It is owned by Mozilla Corporation Mozilla Firefox was officially announced in February 2004. It was earlier named Phoenix, Firebird, and eventually Firefox.

Features: It supports tabbed browsing that allows the user to open multiple sites in a single window.

3. **Google Chrome:** This web browser was developed by Google. Its beta and commercial versions were released in September2008 for Microsoft Windows.   **Features**: Tracking option available with Chrome.

4. **Safari:** Safari is one of the web browser developed by Apple inc.
It is the most popular browser in MAC users.

Features: It is a clean browser, very fast based on the WebKit rendering engine.

5. **Opera**: Opera is the smaller and the faster browsers than any other browsers.

Features: It is smaller it is full– featured. Some of the features available in opera are fast, user–friendly, multiple windows, zoom functionality, and many more.

3. Write various advantages and disadvantages of e–mail.
A. Advantages of E–mail:

1. **Fast** –Messages can be sent anywhere around the world in an instant.

2. **Inexpensive**–Transmission usually costs nothing, or at the most, very little.

3. **Simple**– Easy to use, after initial setup.

4. **Efficient**–Sending to a group can be done in one step.

5. **Versatile** – Pictures , power – points or other files can be sent too .

6. Printable–The hand copy is easy to obtain. We can correspond and save e-mail message and also we get electronic copy of message.

Disadvantages of E – mail:

1. Emails may carry viruses. These are small programs that harm your computer system. They can read email address book and send themselves to a num of people around the world.

2. Many people send unwanted emails to others. These are called spam mails. It takes a lot of time to filter out the unwanted emails from those that are really important.

3. Emails cannot really be used for official business documents. They may be lost and you cannot sign them.

4. Your mailbox may get flooded with emails after a certain time so you have to empty it from time to time.

4. How do you send and receive an E-mail with attachment?

A. Sending an E-mail:

To Send an e-mail, sender must have email-id (user name &password), receiver's email-id, message, subject of the mail and location of a file to be attached etc.

1. You must open your email account provider such as gmail, yahoo or rediff etc.

2. Login into your email-id by using name and password.

3. After logged in, click on compose

4. Enter address of the receiver (s) in the " To" field

5. You must write the subject that means email is for what purpose in the " subject " field

6. You must write in the contents of your email in message box .

7. If you want to attach files, click on attach and give the location of a file to be attached.

8. Finally , click on " Send " to send.

If everything is correct, then you will be noticed that your message has been sent, view message "

Receiving an E-mail:

To receive an e-mail, receive must have email-id (user name& password),

1. You must open your email account provider such as gmail, yahoo or rediff etc .
2. " Login " into your email-id by using user name and password .
3. After logged in, click on inbox to see all the Emails you have received .
4. After opening the Inbox you will the person and the subject who have sent you the mail.
5. Clicking on it will open the mail and you can see the data which have been sent to you .
6. If an attachment is there, then you can view or download by clicking.
7. There will be a reply option in case if you want to reply to the sender.
8. You can save the attachments if you want.

5. Write about Internet Security.

A. Internet security is a protection to the computer and files stored in it, from any harmful and malicious spyware through internet. There are many antivirus software available to protect computers and files.

1. **Virus** : A software program written to disrupt computer systems and to destroy data viruses are the most well known Internet security threat.
2. **Worms**: A worm is a program that can replicate itself and send copies from computer to computer across network connections.

3. **Trojan Horses**: It is actually designed to cause loss or theft of computer data and to destroy computer systems. They usually arrive as email attachments or bundled with other software.

4. **Phishing**: Phishing is an e-mail fraud method in which the perpetrator sends out legitimate-looking email in an attempt to gather personal and financial information from recipients.

5. **Hacking**: The persons making hawking are called Hackers. They are experts in computer and Internet skill levels sufficient enough to break security settings on personal computers and servers over the Internet. Some hackers do it for recreation, others for malicious intent.

6. **Antivirus software**: Antivirus software is a computer program that detects, prevents, and takes action to disarm or remove malicious software programs , such as viruses and worms.

6. Explain different type of Firewall.

A. **Firewall** : A Firewall is software that is used to provide the security of private network It prevents unauthorized access to private networks connected to the network. It provides better safety where data can be encrypted. Firewall may be implemented using hardware, software or both. It serves as a blockade between trusted internal network and untrusted external network.

Following are the different types of firewall

1. **Packet filtering**: On the Internet, packet filtering is the process of passing or blocking packets at a network interface based on source and destination addresses, ports, or protocols. The process is used in conjunction with packet mangling and Network Address Translation(NAT). Packet filtering is often part of a firewall program for protecting a local network from unwanted intrusion.

2. **Proxy server:** A proxy server is a system or router that provides a gateway between users and the internet. Therefore, it helps prevent cyber attackers from entering a private network. It is a server, referred to as an "intermediary" because it goes between end-users and the web pages they visit online.

3. **Application gateway:** Application pathways provide high-level secure network system communication. **For example** when a client requests access to server resources such as files, Web pages and databases, the client first connects with the gay server which then establishes a connection with the main server.

4. **Dynamic packet filtering:** A dynamic packet fiber is a firewall facility that can monitor the state of active connections and use this information to determine which network packets to allow through the firewall.

5. **Circuit level gateway:** A proxy server is a security barrier between internal and external computers, while a circuit-level gateway is a virtual circuit between the proxy server and internal client.

UNIT- VI

TROUBLE SHOOTING

Short Answer Type Questions

1. **What is Trouble Shooting ?**

A. **Trouble shooting** is a process in which certain measures and processes are collectively used to identify and fix problems which are encountered with in a Network or any Hardware device. Trouble shooting can be both manual and automatic.

2. **What is Mother Board ?**

A. **Mother Board:** Mother Board is the major component which handles entire communication between hardware components inside the PC.

3. What is HDD ?

A. HDD (Hard Disk Drive) is a Secondary storage device which stores data permanently.

4. What is printer ?

A. Printer: A printer is an external hardware output device that takes the electronic data stored on a computer or other device and generates a hardcopy of it.

5. Give the possible reasons for the not printing .

A. When a printer is unable print , there may be a possibility that either the printer is experiencing a hardware or software problem.

6. What are the tools used in the network trouble shooting ?

A. Many tools such as PING Trace route, Nslookup, netstat, putty path ping, etc which helps in trouble shooting network connection issues.

7. How to face the problem of The Power doesn't come on SMPS ?

A. The Power doesn't come on

1. Check the Power from the wall socket
2. Check the Voltage Setting On the CPU
3. Check the Power switch of the Cabinet and Front Panel of Mother Board
4. Check the Power Supply Connections to the Motherboard
5. Check the SMPS without connecting it to the motherboard, you could see the two wire green and black which you have to short them (using any piece of wire/paper clip) in the 24 pin mother board connector of the SMPS.

8.Explain different types of software solution to trouble shoot of HDD?

A. Below is a listing of a software programs available that are designed to test your computer's hard drive for errors.

1. ScanDisk
2. Chkdsk

3. TestDisk

4. Seagate SeaTools

5. HDD health

9. Explain the concept of ping ?

A. **Ping:** This utility is used to perform basic connectivity tests between requesting and destination hosts. Internet control message protocols (ICMP) is used for this which sends an echo packet to destination and it listens response from the host.

Long Answer Type Questions

1. What is Trouble Shooting and write the processes of Trouble shooting.

A. **Trouble Shooting:** Trouble shooting is a process in which certain measures and processes are collectively used to identify and fix problems which are encountered with in a computer network. It is a systematic process which aims to resolve problems or to optimize the network. Some of the processes used in network trouble shooting are:

Identifying and resolving problems and establishing network connections of a device

➢ Configuration of network management devices such as router, switch etc.

➢ Installing cables or Wi-Fi devices

➢ Removing viruses

➢ Adding, configuring and reinstalling a network printer

Trouble shooting processes are not only limited to above. They can be manual or automatic tasks. Network diagnostic software can be used for network management using automated tools. There are some tools which helps in trouble shooting most networking issues.

➢ Ping

➢ Tracert/traceroute

➢ Ipconfig/ifconfig

➢ Nslookup

2. Explain how you will trouble shoot when system is not functioning.

A. **Troubleshooting:** Do you know what to do if your screen goes blank? What if you can't) in seem to close an application, or can't hear any sound from your speakers? Whenever you have a problem with your computer, don't panic! There are many basic troubleshooting techniques you can use to fix issues like this .In this lesson, we'll show you some simple things to try when troubleshooting , as well as how to solve common problems you may computer's sends computer or while TROUBLE SHOOTING encounter.

General tips to keep in mind: There are many different things that could cause a problem with your compute. No matter what's causing the issue, troubleshooting will always be a process of trial and error–in some cases, you may need to uses several different approaches before you can find a solution; other problems may be easy to fix. We recommend starting by using the following tips.

- **Write down your steps:** Once you start troubleshooting , you may want to write down each step you take . This way , you'll be able to remember exactly what you've done and can avoid repeating the same mistakes . If you end up asking other people for help, it will be much easier if they know exactly what you've tried already.

- **Take notes about error messages:** Your computer gives you an error message, be sure to write down as much information as possible . You may be able to use this information later find out if other people are having the same error

- **Always check the cables:** If you're having trouble with a specific piece of computer hardware , such as your monitor or keyboard , an easy first step is to check all related cables to make sure they're properly connected.

- **Restart the computer** : When all else fails , restarting the computer is a good thing to try. This can solve a lot of basic issues you may experience with your computer.

3. Explain the concept of various trouble shoots in Printer.

A. A **printer** is an external hardware output device that takes the electronic data stored on a computer or other device and generates a hard copy of it.

Trouble Shooting A Printer:

When a printer is unable to print, there may be a possibility that either the printer is experiencing a hardware or software problem. Before testing the software, it is always recommended that the printer is tested for hardware issues first.

Testing Hardware :

1. Check that paper is loaded and that there are no paper jams.
2. Check the cable connections. Both the power cable and data cables(eg. USB cable) going from printer and to your computer,
3. Verify that the printer power indication light is turned.
4. Verify that the printer has no flashing lights or Red or Orange lights. Having rod, orange. or any other flashing lights indicates malfunctioning of printer.
5. Run a self – test on the printer. Running a self – test should print a basic page of information indicating the printer is physically working. Your users manual should have the instructions for printing a self–test. If your printer does not print a self–test , it's a good contact the printer manufacturer. Possibility that there is a defect or misconfiguration with your printer, and you should contract the printer manufacturer.

Testing Software Windows users:

1. If possible, make sure your printer can print using the above hardware tests .

2. Install the printer software provided with your printer. If no software was provided with your printer, see the printer driver's page for a listing of printer drivers. Drivers are required for your printer to properly work with the operating system.

3. Click Start, Settings, and Printers. Within the printer's window, verify that your printer manufacturer and model is listed.

4. Print a test page by right-clicking the printer icon and then click the Properties option and click print test page. If the test page does not print, download the latest drivers from your printer manufacturer . For a list of printer drivers, see our printer driver's index.

5. If the page prints successfully, get back into the printers window, right-click the printer and ensure that there check next to Set as default. Newer versions of Windows also show check next to the printer icon once it has been set as the default printer.

6. Once the printer is set as default, click Start, Run, type notepad, and press Enter. In Notepad, type a test message and click File and Print. If the printer also prints successfully from this program, but you are still unable to print from another program, it is likely that program has an issue and not your printer.

4. Explain the handling mechanism to handle troubles in Mother Board.

A. Trouble Shooting Of Motherboard:

Motherboard and processor are most important hardware components of a computer Entire communication between the hardware components inside the pc is done through the circuits in the motherboard. Thus replacing the motherboard in case of failure is very expensive but diagnosing of hardware on failure will reduce the repair costs.

The motherboard itself is a computer, thus a failed motherboard exhibit a usual symptom of completely dead system. When the motherboard is dead fans, drives and other peripherals may spin up, but nothing at all happens when you turn on the power common symptoms of a motherboard issues are very similar to CPU problems :

- The system does not display anything
- One or more beeps occur
- Appearing of error code
- System locks
- The system reboots
- Window BSOD (blue screen of death) appears
- Failure of memory module
- It is most difficult to troubleshoot the motherboard problems and power problems Below are the some of the steps that helps in trouble shooting motherboard.
- Check whether the motherboard is receiving power or not
- Check the BIOS settings
- Power off the computer and let it cool down.Check for over heating.
- Boot the computers and remove unnecessary adapters and devices
- Check whether there is any short in motherboard.
- Refer to the online mother board documents to resolve the problems and find a solution.

5. Explain the various trouble shoots in Modem and SMPS.

A.SMPS–Switched Mode Power Supply, An SMPS is a Device to efficiently provide a regulated output voltage, from different level of the input voltage . SMPS transfers power from a source like the electrical power grid to a load (Eg: Computer).

Troubleshooting SMPS:

Problem 1: The Power doesn't come on.

Solutions:

1. Check the Power from the wall socket

2. Check the Voltage Setting On the CPU

3. Check the Power switch of the Cabinet and Front Panel of Mother Board

4. Check Power Supply Connections to the Motherboard

5. Check the SMPS without connecting it to the motherboard, you could see the two wire green and black which you have to short them (using any piece of wire/paper clip) in the 24 pin motherboard connector of the SMPS.

Problem 2 : The PC Powers on after the second or third try

Solutions :   1. Check the Power switch of the Cabinet

2. Replace SMPS (Get a Better Quality SMPS)

Problem 3 : The PC Powers on but nothing happens after that (no beep)

Solutions :

1. Remove the last hardware component installed and check again

2. Replace SMPS (Get a Better Quality SMPS)

3. Check the power cables to the Devices Hard disk . DVD Drive etc

Problem 4 : The PC Powers on beeps and stops. NO Power On Self Test (POST) messages

Solutions :   1. Check with another SMPS

2. This may be a Motherboard Problem .

Problem 5: The PC Powers on runs POST but there is no display

Solutions :

    1. Check the Monitor and the VGA Cable Connections

    2. Check with another SMPS

    3. This may be a Display Card Problem

Problem 6 : There is a squealing /whistling/whining noise from SMPS when the PC starts

  Solutions :   1. Check the SMPS Fan

                  2. Component problem with SMPS. Replace it

Problem7 : The PC freezes or reboots suddenly

Solutions :   1. Check the SMPS Fan (May be overheating Problem)

                 2. Replace the SMPS.

6. Explain the concept of various trouble shoots in HDD.

A. A bad hard drive may cause various issues on your computer. Here are some of the possible issues. (These issues can also be caused not only by a bad disk drive but also for various other reasons)

1. Errors when reading, copying, moving, or deleting data on the computer. Extremely slow.

2. Operating system unable to boot .

3. Other random errors or computer reboots .

Software solutions: Below is a listing of a software programs available that are designed to test computer's hard drive for errors.

- **ScanDisk**–Users running Microsoft Windows who're still able to get into can utilize the already installed disk checking tool ScanDisk to find and repair an errors on their hard drive.

- **Chkdsk** – Another Windows command line utility to test the hard drive. If you're unable to boot into Windows, boot from the Windows CD, enter the recovery console, and run chkdsk/f to fix errors .

- **Test Disk**-Fantastic free and open-source utility to test and fix different hard drive errors .
- **Seagate Sea Tools**-Fantastic and free program that is used to test all computer hard drives
- **HDD health**-Another great program that utilizes SMART technology to display a hard drive's statistics, such as the temperature of the drive, it's overall health, and every other SMART attribute.

SMART is the short form of Self – Monitoring Analysis and Reporting Technology

S.M.A.R.T analyzes many of the mechanical attributes, over time, some failures can be predicted. Although S.M.A.R.I technology can detect upcoming issues, not all hard drive failures are predictable.

Another option is to download the files to make an Ultimate Boot CD. The Ultimate Boot CD contains multiple tools for testing computer hardware , including hard drives , and help fix.

Replace the hard drive: If the hard drive appears to be bad or is generating SMART errors indicating its bad even after trying the above suggestions , replacing is the better option .

The picture below is an example of a S.M.A.R.T error indicating that the status of the Primary (master) hard drive is being detected as bad and that it should be replaced .

7. Explain the concept of various trouble shoots in FDD.

A. Trouble Shooting in FDD

- Check whether are attempting to read is not bad . It should not write protected.
- Checking whether it is write protected can be done by sliding the tab into opposite direction thus preventing the light from shining through it .

- If there is no tab. place tape over this bole.

- Because of the functionality of floppy drives it is bad.

- Verify that other floppy disks are not exhibiting the same issue.

- If other floppies work well, it is likely that you may have a bad floppy diskette.

Not setup in CMOS :

- Verify the floppy drive is property set up in CMOS setup.

- If the floppy drive is not set up proper, you may experience real/write error or the floppy may not work at all. Most computers need to have the floppy setup as a 3X1.44MB.

Not connected property :

- Power down, unplug, and open the computer being aware of ESD and is potential dangers.

- Verify the floppy connection is connected to the motherboard FDD con appears to be connected, disconnect and then reconnect the cable and check the cable seated properly.

- Verify the floppy cable coming from the motherboard is connected to the book of the floppy drive. If connected, disconnect and reconnect the floppy drive cable a vend is seated properly.

- Verify a power cable is connected to the back of the type drive.

- If your floppy cable has more than one connection, verify that you have connected the floppy to the appropriate connection. The above picture illustrates what drive should be connected where.

Bad drivers: If you are not able to write to a floppy diskette from Windows

- Verify the computer is not exhibiting floppy driver issues by testing the toy dive from MS–DOS .

- If you are running Windows95, Windows98, WindowsME, Windows NT, Windows 2000, or Windows 2000, click Start, Shutdown, and

Restart the computer to an MS DOS prompt. If you are running latest version windows, click Start, type cmd to get the prompt.

- Once at the prompt , place a diskette into the floppy disk drive and type format a;
- If you receive any of the following errors when trying to format the floppy disk

> **Invalid media or Track 0 Bad**–Try formatting another floppy disk.

> **Write Protect Error**–Ensure the disk is not write protected by removing the floppy disk and verifying you cannot see through both holes. If you can see light, move the tab on the left side (looking from the back of the floppy) to the down position try again. If the disk is not write protected , try another floppy disk .

> **Invalid drive specification**–Verify the floppy drive is set up properly in CMOS setup .

> If the floppy disk drive formats properly in MS–DOS but does not format in Windows, it is likely that Windows or a program within Windows is preventing the floppy drive from working . End task all running background programs . If you continue to experience the same issues , we recommend that Windows be reinstalled.

Bad hardware: If you continue to experience issues after following the above steps, it is likely that some of the hardware in the computer is bad. Replace the following hardware in the computer in the below order.

1. Replace the floppy data cable that connects the computer floppy drive to the motherboard.
2. Replace the floppy drive if the floppy data cable did not resolve your issues.
3. Replace or request that the motherboard be replaced.

8. Explain the concept of various trouble shoots in CDROM.

A. Trouble Shotting CD-ROM

A bad disk drive can cause many issues. Such as

- ➢ Error when reading CD or DVD.
- ➢ CDs or DVDs may not play audio or video properly.
- ➢ CD or DVD programs may not install or encounter errors after being installed There are different ways to test CD drive to determine if it is bad.

Below are some of the solutions to resolve the issues.

CD and DVD drives can sometimes get dusty and dirty inside, causing problems with reading discs. Using a CD/DVD Drive Cleaner kit helps to clean the disc drive. Some of the software programs available to test your computer's CD and DVD drives

- ➢ **CDRuler**-Great program that is used to test and, if needed, recover data from CDs DVDs.
- ➢ **CDCheck**-Another great program used to help check CD drives (no DVD compatibility) and can also be used to help recover data from damaged discs.
- ➢ There are some other commercial products which helps to resolve. Below is one of these products.
- ➢ **CD/DVD Diagnostic**-Diagnostic program from InfinaDyne that is not only capable of testing a drive and disc, but also can recover some or all data from discs that may be bad.

Check the power supply:

If the power supply is not providing enough power to the disc drive , it results in improper functionality. Incase of insufficient power disc drive may not be able to read disc properly. You can check the power supply to determine if it is not working correctly .

If the disc tray will not open, that may also be a result of the power supply not providing power, or enough power, to the disc drive .

Replace the disc drive:

If the disc drive is still unable to read any CD or DVD after trying the above suggestions,the disc drive is most likely bad. It is recommended that you replace the disc drive to fix the problem.

QUESTION BANK
DATA COMMUNICATIONS AND COMPUTER NETWORKS
UNIT–I
DATA COMMUNICATION

Short Questions

1. What is data communication ? List types of data communications.
2. Write various modes of data transmission.
3. Define bandwidth.
4. List various communication channels
5. Write various methods of data transmission.
6. What is Asynchronous Data Transmission ?
7. Write various forms of Data Transmission?
8. What is parallel and serial interface?
9. What is multiplexing ? Write various types of multiplexing?

Long Questions

1. Explain various types of data communications.
2. Write about transmission modes.
3. Explain synchronous Asynchronous &Isochronous data transmission methods.
4. Explain various types of multiplexing with neat diagrams.
5. Explain different methods of Data Transmission.
6. Explain about various communication channels.

UNIT–II

Network Types and Topologies

1. What is a Network?

2. What is internet?

3. What is WWW?

4. Write various advantages of networks.

5. List various disadvantage of Networks.

6. List various types of Networks.

7. Expand LAN, WAN, MAN.

8. Expand BBN,GAN.

9. What is Network Topology ? List types of topologies ?

10. Write any two advantages and two disadvantages of topologies.

Long Questions

1. Explain different types of computer networks.

2. Explain about Internet.

3. Explain about network topologies.

4. Explain advantages and disadvantages of different types of network topologies.

UNIT–III

LAN Components

Short Questions

1. What are LAN Components ?

2. Write various types of LAN Components.

3. Define: Server and Client

4. What is a file server ?

5. What are Ethernet Cards?

6. What are Hubs and Switches ?

7. What is Router?

8. What are Gateway?

9. What is a Modem and list types of Modems ?

10. Write briefly about ATM.

11. What is an adapter ? What is the function of an Adapter ?

12. List types of Adapters.

13. What is a multiplexer? Write any two functions of it.

14. Expand V–SAT, ATM, FTP, EDI.

Long Questions

1. Explain briefly about any three LAN Components.

2. Explain the function of Modem with a neat diagram.

3. Discuss briefly about: Hubs and Switches.

4. Explain in detail about V–SAT

5. Explain in detail about ATM with its layer architecture.

6. Discuss about Routers and Gateways.

7. Explain in detail about hubs and its types

UNIT –IV

Computer Networks

Short Questions

1. What is computer Network?

2. What is Protocol?

3. Expand the terms OSI, TCP/IP, FTAM, SMTP, FTP, HTTP, SNMP, ISDN.

4. What is Firewall?

5. List the layers of OSI Reference Model.

6. List the layers of TCP /IP Reference Model.

Long Questions

1. Explain OSI Reference Model in detail.

2. Explain TCP/IP Reference Model in detail.

UNIT-V

Intenet Connectivity and Services

1. What is an Internet?

2. Write advantages of Internet.

3. What is a Browser ? List types of browsers.

4. What is a Message?

5. What is an E-mail ?

6. Write any four uses of E-mail.

7. What is an attachment ?

8. What is voice messaging ?

9. What is Internet Explorer ?

10. What is FTP ?

11. What is a Protocol and Write types of Network Protocols?

12. What is Internet Security ?

13. What is a virus ?

14. What is a Trojan ?

15. What is Hacking ?   16. What is a Worm?

17. Expand FTP, E-Mail, WWW, TCP/IP

18. Expand ISDN, HTTP, FTP, NIC

19. What is Firewall?   Long Questions

1. What is an Internet ?

2. Explain any three advantages and three   disadvantages of Internet.

3. Explain various Web Browsers

4. Write various advantages and disadvantages of e-mail.

5. How do you send and receive an E-mail with attachment.

6. Write about Internet Security.

7. Explain different type of Firewall

UNIT–VI

Trouble Shooting

1. What is Trouble Shooting?

2. What is Mother Board?

3. What is HDD?

4. What is printer?

5. Give the possible reasons for the printer and printing.

6. What are the tools used in the network trouble shooting?

7. How to face the problem of The Power doesn't come on SMPS?

8. Explain different types of software are solution to trouble shoot of HDD?

9. Explain the concept of ping?

Long Questions

1. What is Trouble Shooting and write the processes of Trouble Shooting.

2. Explain how you will trouble shoot when system is not functioning.

3. Explain the concept of various trouble shoots in Printer.

4. Explain the handling mechanism to handle troubles in Mother Board.

5. Explain the various trouble shoots in Modem and SMPS.

6. Explain the concept various trouble shoots in HDD.

7. Explain the concept of various trouble shoots FDD.

8. Explain the concept of various trouble shoots in CDROM.

----------HARD WORK IS SECRETE OF SUCCESS---------