N+ ASSIGNMENT

Module - 1

- What is network?

  A group of computers which are connected to each other for the purpose of sharing their resources is called computer network.

- Explain type of network-- LAN, MAN, WAN?

  LAN – Local Area Network

  - It is used for buildings like offices.
  - Transmission speed of data is high.
  - LAN network range 0 to 150m.
  - LAN network ownership is private.
  - Easy to maintain.
  - Setup cost and error rate is low.

  MAN – Metropolitan Area Network

  - It is used for cities.
  - Transmission speed of data is average.
  - MAN network range 5 to 50km.
  - MAN network ownership is private or public.
  - Difficult to maintain than LAN.
  - Setup cost and error rate is average.

  WAN – Wide Area Network

  - It is used for countries.
  - Transmission speed of data is low.
  - WAN network range no fixed.
  - WAN network ownership also private or public.
  - Also difficult to maintain than MAN or well as LAN.
  - Setup cost and error rate is very high.

- What is Internet?

  Internet is a network of networks that is used to interlinked many different types of computers all over the world.

- Define Network Topologies

  Topology -- The physical arrangement of the computer system/node, which is connected to each other via communication medium is called Topology.

- Define list of cables in use of network -Twisted pair, Fiber optics

  Twisted pair cables :- Ethernet connections
  Local Area Network (LAN)
  Internet connectivity
  Easy to install
  Flexible

  Fiber optic cables :- High speed data transfer
  Long distance connectivity
  High bandwidth applications
  High security

- Straight cable standard sequence 568 A and 568 B

568 A Wiring standard :-	568 B Wiring standard :-
Pair 1 : White/Green (green stripe) Green	**Pair 1 :** White/Orange (orange stripe) Orange
Pair 2 : White/Orange (orange stripe) Blue	**Pair 2 :** White/Green (green stripe) Blue
Pair 3 : White/Blue (blue stripe) Orange	**Pair 3 :** White/Blue (blue stripe) Green
Pair 4 : White/Brown (brown stripe) Brown	**Pair 4 :** White/Brown (brown stripe) Brown

- What is Fiber optics module and Fiber connector

  Fiber optic module :- Fiber optic module is used to connect devices in a fiber optic network.

  Fiber connecter :- Fiber connector is a device that attaches to the end of a fiber optic cable. It is used to connect other devices or networks.

  Types of Fiber connecters :- SC (Subscriber Connector)
  ST (Straight Tip)

- Explain Switch

  Switch is a network device that connects multiple computers together in the network. It is mainly used to send the private message as well as there is no wasting of data.

Switch can easily identify that which device is connected with which port by using MAC address, that's why it delivered message on particular destination machine.
Switch is more intelligent than HUB.

Advantages: - It is generally used to unicast the message.
It provides more security than HUB.
Switch support full duplex data transmission mode.
It is used to send the data packet based on MAC address.
If a node fails, there will be no effect in the entire network.

Dis-advantages: - If switch is failed than entire network will be failed.
It is more expensive.
Difficult to setup.

➢ Explain Router

Router is a network device which works as a traffic controller.
A main work of router is to choose a congestion free path through which the data packet will travel.
Router receive data packets to the sender, analyse and forward those data packet then giving to receiver.
Router uses both LAN and WAN network.

Advantages: - It provides connection between two dis-similar type of network.
Transmission rate is very high.
It internally uses some algorithm to find out congestion free Path.
It provides both wire or wireless facility.

Dis-advantages: - Router is more expensive compare to other network device.
Routers are complex to maintain.
Security issues.
It only work with routable protocol.

➢ Explain MODEM

Modem is a hardware device.
Modem stands for modulator & demodulator, it is a network device that is placed between the computer system and other digital devices.
It has two part modulator & demodulator.
Modulator convert digital signal to analog signal were as demodulator convert analog to digital signal.

It allow as to computer to connect internet.

➢ Explain DHCP Dynamic host configuration protocol

DHCP (Dynamic Host Configuration Protocol) is a network protocol that automatically assigns IP addresses to devices on a network.

Port number : 67 - 68

➢ Explain Domain Naming Services

DNS (Domain Naming Services) is a use for converting name to IP addresses and IP addresses to name.

Port number : 53

➢ What is protocol?

Protocol is a “set of rules” which are used in digital communication to connect network devices and exchange information between them.

➢ What is unicast multicast and broadcast?

Unicast :- One-to-one communication

Data sent from a single source to a single destination

Multicast :- One-to-many communication

Data sent from a single source to multiple destinations

Broadcast :- One-to-all communication

Data sent from a single source to all devices

➢ What is OSI model?

OSI stands for “Open System Interconnection” model, it has been developed by standard organization ISO (International Organization for Standerization) the year 1984.

It is a 7 layer architecture where each layer having specific functionality.

All these 7 layer work collaboratively to transmit the data from one network to another network across the globe.

Here are the 7 OSI models :

1.Physical Layer : Transmits raw data over physical mediums.

2.Data Link Layer : Ensures error-free data transfer over a physical link.

3.Network Layer : Handles routing and addressing.

4.Transport Layer : Ensures reliable data transfer.

5.Session Layer : manages sessions or connections between applications.

6.Presentation Layer : Data translation, encryption, and compression.

7.Application Layer : Interface between the user and network services.

➢ What is port number?

Port number is a unique ID of protocols in computer network.
It is a 16 bits value.
Total port number :- 65535
Reserve port number :- 0-1023
Public port number :- 1024-65535

➢ Difference between TCP V/S UDP communications

TCP :- TCP is a connection oriented protocol.
It is a reliable.
It is slower than UDP.
The header size of TCP is 20 bytes.
Retransmission of lost packets is possible.

UDP :- UDP is a connectionless protocol.
It is not reliable.
It is faster than TCP.
The header size of UDP is 8 bytes.
Retransmission of lost packets is not possible.

➢ What is flow control?

Flow control is a mechanism to regulate the amount of data sent between devices, preventing network congestion and data loss.

➢ What is the difference between TCP IP model and OSI model?

- TCP/IP has four layers while OSI has seven layers
- TCP/IP focuses on communication protocols while OSI focuses on network architecture.
- In TCP/IP protocols were developed first and then the model was developed while in OSI model was developed before the development of protocols.
- TCP/IP follows horizontal approach on the other hand OSI uses Vertical approach.

➢ What is Arp broadcast?

ARP broadcast is a request sent to all devices on a network to resolve an IP address to a physical MAC address.

➢ What is mac-address?

A MAC address is a unique 48-bit identifier assigned to a network device's network interface card (NIC) for communication on a network.

➢ What is an IP address ?

An IP address is a unique numerical label assigned to each device connected to a computer network, allowing devices to communicate with each other and identify themselves on the network.

Difference between ipv4 address and ipv6 address

- IPv4 uses a 32-bit address while IPv6 uses a 128-bit address.
- IPv4 is a numeric address that consist of 4 fields which are separated by dot
- While in IPv6 is an alphanumeric address that consist of 8 fields which are separated by colon
- IPv4 can be used in local public networks while IPv6 can be used for all research organisations.
- IPv4 is less secure in compared to IPv6
- Example of IPv4 – 192.168.0.1

  IPv6 – 684D:1111:0000:0000:6c3a:b17d:0000:10a9

➢ IF assigned multiple IPv4 in single network adapter in pc what are network vulnerabilities?

Assigning multiple IPv4 addresses to a single network adapter can increases attack surfaces, misconfiguration risks, and makes it harder to manage security, potentially exposing the system to exploits.

➢ What is a firewall to use for?

A firewall is used to block unauthorized access to a network or device, controlling incoming and outgoing traffic to prevent hacking and cyber threats.

➢ Wireless router configures for internet connection and wireless security what is wireless access point? And what is wireless extender?

A Wireless Access Point is a device that connects wireless devices to a wired network, allowing them to access the internet or other network resources. It acts as a bridge between wireless and wired networks.

A Wireless Extender, also known as a Range Extender, is a device that amplifies and rebroadcasts the wireless signal from a router or access point to extend its coverage area, eliminating dead spots and improving network connectivity.