**Day-1 (Assignment-1)**

# **Q)explain network terminology**

A network, in the context of computer science and telecommunications, refers to a group of interconnected devices that can communicate and share resources. Networks can vary in size from a small home network to large global networks like the Internet. Here's an overview of key network terminology:

**Terminology:**

## **1) Node**

A node is any physical device within a network that can send, receive, or forward information. Examples include computers, smartphones, printers, and routers.

## **2) Host**

A host is a specific type of node that uses an IP address to communicate over a network. It typically refers to computers or devices that provide services or resources.

## **3) Router**

A router is a networking device that forwards data packets between computer networks. It directs traffic on the Internet by using headers and forwarding tables to determine the best path for forwarding the packets.

## **4) Switch**

A switch is a device that connects devices within a single network, using packet switching to forward data to its destination. It operates at the data link layer (Layer 2) of the OSI model.

## **5) Hub**

A hub is a basic networking device that connects multiple Ethernet devices, making them act as a single network segment. It operates at the physical layer (Layer 1) and simply repeats the signal to all connected devices.

## **6) Modem**

A modem (modulator-demodulator) is a device that modulates and demodulates analog signals for digital data transmission over telephone lines or cable systems.

## **7) IP Address**

An IP address (Internet Protocol address) is a unique string of numbers separated by periods (IPv4) or colons (IPv6) that identifies each computer using the Internet Protocol to communicate over a network.

### **IPV4**

The IPv4 address is a 32-bit number that uniquely identifies a network interface on a machine. An IPv4 address is typically written in decimal digits, formatted as four 8-bit fields that are separated by periods. Each 8-bit field represents a byte of the IPv4 address.

### **IPv6**

An IPv6 address is 128 bits in length and consists of eight, 16-bit fields, with each field bounded by a colon. Each field must contain a hexadecimal number, in contrast to the dotted-decimal notation of IPv4 addresses. In the next figure, the x's represent hexadecimal numbers.

## **8) MAC Address**

A MAC address (Media Access Control address) is a hardware identifier that uniquely identifies each device on a network. It is assigned to the network interface card (NIC) by the manufacturer.

## **9) DNS**

DNS (Domain Name System) is a hierarchical and decentralized naming system for computers, services, or any resource connected to the Internet or a private network. It translates domain names to IP addresses.

## **10) Subnet**

A subnet (subnetwork) is a logically visible subdivision of an IP network. Dividing a network into subnets helps improve routing efficiency and enhances security.

## **11) LAN**

A LAN (Local Area Network) is a network that connects computers and devices within a limited geographical area, such as a home, school, or office building.

## **12) WAN**

A WAN (Wide Area Network) is a telecommunications network that extends over a large geographical area for the primary purpose of computer networking. The Internet is the largest example of a WAN.

## **13) Bandwidth**

Bandwidth is the maximum rate of data transfer across a given path. It is usually measured in bits per second (bps).

## **14) Latency**

Latency is the time it takes for data to travel from the source to the destination. It is often measured in milliseconds (ms).

## **15) Protocol**

A protocol is a set of rules and conventions for communication between network devices. Examples include TCP/IP (Transmission Control Protocol/Internet Protocol), HTTP (Hypertext Transfer Protocol), and FTP (File Transfer Protocol).

## **16) Firewall**

A firewall is a network security system that monitors and controls incoming and outgoing network traffic based on predetermined security rules. It establishes a barrier between a trusted internal network and untrusted external networks.

## **17) VPN**

A VPN (Virtual Private Network) extends a private network across a public network, allowing users to send and receive data as if their devices were directly connected to the private network.

## **18) Topology**

Network topology refers to the arrangement of different elements (links, nodes, etc.) in a computer network. Common topologies include star, bus, ring, and mesh.

## **19) Packet**

A packet is a unit of data that is transmitted over a network. It typically includes a header (with control information like source and destination addresses) and a payload (the actual data).

## **20) Ethernet**

Ethernet is a family of networking technologies commonly used in LANs. It specifies the physical and data link layers' protocols for controlling access to the physical transmission medium.

Understanding these basic terms and concepts is crucial for anyone working with or studying computer networks. They form the foundation for more advanced networking concepts and technologies.