CCA-102: Data Communications

ASSIGNMENT 02

1. What are the different types of networks?

Ans : - There are different types of networks based on their size, distance, and structure. Here are some of the most common types of networks:

- Personal Area Network (PAN)
- Local Area Network (LAN)
- Metropolitan Area Network (MAN)
- Wide Area Network (WAN)

2. Explain the Shielded twisted pair (STP) and Unshielded twisted pair(UTP)

Ans :- Shielded twisted pair (STP) and Unshielded twisted pair (UTP) are two types of twisted pair cables used in telecommunications. The basic difference between UTP and STP is that UTP is an unshielded cable with wires that are twisted together to reduce noise and crosstalk. On the other hand, STP is a twisted pair cable confined in foil or mesh shield that guards the cable against electromagnetic interference[1].

UTP cables are cheaper than STP cables because they do not require additional shielding. However, STP cables provide better protection against electromagnetic interference and are more reliable in noisy environments

3. What is difference between baseband and broadband transmission?

Ans : - Baseband and broadband transmission are two types of data transmission techniques used in telecommunications. The key differences between baseband and broadband transmission are:

- Baseband transmission sends only one signal at a time, while broadband transmission sends multiple signals with multiple frequencies through a single channel simultaneously.
- Baseband transmission uses digital signals, while broadband transmission uses analog signals.
- Baseband transmission is bidirectional in nature, while broadband transmission is unidirectional in nature.

4. What is the difference between a hub, modem, router and a switch?

Ans :- A hub, modem, router and switch are all devices used in computer networking. Here are the differences between them:

- A hub is a device that connects multiple devices together to form a single network segment. It is a simple device that does not perform any filtering or processing of the data.
- A modem is a device that modulates digital signals into analog signals for transmission over telephone lines. It also demodulates analog signals back into digital signals for reception.
- A router is a device that connects multiple networks together and routes data between them. It uses routing tables to determine the best path for data to travel.
- A switch is a device that connects multiple devices together to form a single network segment. Unlike a hub, it can filter and process data before forwarding it to its destination.

5. When you move the NIC cards from one PC to another PC, does the MAC address gets transferred as well?

Ans : - Yes, when you move the NIC cards from one PC to another PC, the MAC address gets transferred as well. This is because MAC addresses are hard-wired into the NIC circuitry, not the PC. This also means that a PC can have a different MAC address when the NIC card was replaced by another one

6. **When troubleshooting computer network problems, what common hardware-related problems can occur?**

Ans :- There are many different network problems that can affect network performance. Some network problems can arise from faulty hardware, such as routers, switches, firewalls, and even from unexpected usage patterns, like network bandwidth spikes, changes in app configuration, or security breaches. Hardware problems like defective cables or connectors can generate network errors on the network equipment to which it is connected.

7. **In a network that contains two servers and twenty workstations, where is the best place to install an Anti-virus program?**

Ans :- In a network that contains two servers and twenty workstations, the best place to install an Anti-virus program is in the two servers. Anti-virus should be installed on every machine (servers, PCs, workstations).

8. **Define Static IP and Dynamic IP? Discuss the difference between IPV4 and IPV6.**

Ans : - A static IP address is a fixed IP address that is manually assigned to a device on a network. It does not change unless it is manually changed. A dynamic IP address is an IP address that is automatically assigned to a device on a network by a DHCP server.

The main difference between IPv4 and IPv6 is their address space. IPv4 is a 32-bit system using a string of numbers separated by periods, whereas IPv6 is a 128-bit system using alphanumeric sequences separated by colons. IPv6 offers over 1,000 times the number of unique addresses offered by IPv4. There are other technical differences that make IPv6 more secure and flexible, but its speed is usually the same as IPv4.

9. **Discuss TCP/IP model in detail.**

Ans : - The TCP/IP model is a suite of communication protocols that are used to describe how data is actually communicated between one device to another within a computer network. It stands for Transmission Control Protocol/Internet Protocol. The TCP/IP model is a concise version of the OSI model. It contains four layers, unlike the seven layers in the OSI model. The four layers are:

i. Application Layer
ii. Transport Layer
iii. Internet Layer
iv. Network Access Layer

Each layer has its own protocols and functions that work together to transmit data from one device to another.

10. **What is a Web Browser (Browser)? Give some example of browsers.**

Ans : - A web browser is a software application used to access and view websites on the internet. It interprets HTML code, CSS styling, and JavaScript code to display web pages. Some examples of web browsers include Google Chrome, Mozilla Firefox, Microsoft Edge, Apple Safari, Opera, etc.

11. **What is a search engine? Give example.**

Ans : - A search engine is a software program that searches a database of internet sites and returns a list of sites that match the user's search criteria. Some examples of search engines include Google, Bing, Yahoo!, DuckDuckGo, etc.

12. **What is the Internet & WWW? What are the uses of internet in our daily life?**

Ans : The Internet is a global network of computers that communicate with each other using standardized communication protocols. It is a vast network of networks that connects millions of computers and other devices around the world.

The World Wide Web (WWW) is a system of interlinked hypertext documents that are accessed through the Internet. It was created in 1989 by Tim Berners-Lee and has since become the primary means of accessing and sharing information on the Internet. The WWW uses the HTTP protocol to transfer data between servers and clients.

The internet has become an integral part of our daily lives. It has many uses such as seeking information on any topic in real-time, communicating and collaborating with others, telecommuting, doing transactions with businesses, downloading files, getting educated and entertained, carrying out social and group activities. It supports human communication via social media, email, chat rooms, newsgroups, and audio and video transmission, and allows people to work collaboratively from different locations. The most common uses of the internet in 2022 include web browsing, communication, online booking, cashless transactions, online banking and trading, email, job search, and social networking.

13. What is an Internet Service Provider? Give some example of ISP in India.

Ans : - An Internet Service Provider (ISP) is a company that provides internet access to customers.
In India, there are many ISPs such as Hathway, Airtel Broadband, Reliance Jio Fiber, and others.

14. Discuss the difference between MAC address, IP address and Port address.

Ans : - A MAC address is a unique identifier assigned to a network interface controller (NIC) for use as a network address in communications within a network segment.

An IP address is a unique numerical identifier assigned to each device connected to the internet. It is used to identify the device and communicate with other devices on the internet.

A port address is a number that identifies a specific process to which data is sent or received on a computer.