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CCA-102 : DATA COMMUNICATION⁽¹¹⁾

Q No 1: → What are the different types of networks?

Ans: → A network is defined as a group of two or more computer systems linked together.

There are many types of computer networks, - the common types of area networks including three those three:

LAN (local area network) - Can go up to 1 Km radius.
A local area network (LAN) is a group of computers and associated devices that share a common communications line or wireless link to a server.

Typically, a LAN encompasses computers and peripherals connected to a server within a distinct geographic area such as an office or a commercial establishment.

WAN (wide area network) - No limit. A wide area network (WAN) is a network that exists over a large-scale geographical area. A WAN connects different smaller networks, including local area networks (LANs) and metro area networks (MANs). This ensures that computers and users in one location can communicate with computers and users in other locations. WAN implementation can be done either with the help of the public transmission system or a private network.

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WLAN (Wireless Local Area Network) - A wireless local area network (WLAN) is a wireless computer network that links two or more devices using wireless communications, within a limited area such as a home, school, computer laboratory, or office building. This gives users the ability to move around within a local coverage area and yet still be connected to the network. Through a gateway, a ~~urban~~ WLAN can also provide a connection to the wider internet.

Most modern WLANs are based on IEEE 802.11 standards and are marketed under the Wi-Fi brand name.

Q No 2: Explain the Shielded Twisted Pair (STP) and Unshielded Pair (UTP)?

Ans: Shielded twisted pair cable (STP) has the individual pairs of wires wrapped in foil, which are then wrapped again for double protection; unshielded twisted pair cable (UTP) has each pair of wires are then wrapped in tubing without any other protection. UTP cables are less expensive and a more popular type of cabling.

Q No 3: What is difference between Baseband and Broadband transmission?

Ans: Baseband transmission is a data transmission technique in which one signal needs the

whole bandwidth of the channel⁽¹³⁾ to transfer the data. In contrast, broadband transmission is a transmission technology in which many signals with different frequencies send data across a single channel at the same time.

2. Manchester and differential Manchester encoding are used in baseband. In contrast, broadband transmission does not utilize the PSK (Phase Shift Keying) encoding.

3. ~~Broadband~~ Baseband transmission signals travel over shorter distances because attenuation is most noticeable at higher frequencies, which causes a signal to travel short distances without losing power. In contrast, the signals in broadband transmissions may travel across larger distances.

4. Another distinction between broadband and baseband transmission is the direction of signal transmission. Baseband transmission allows signals to be sent in both directions simultaneously. In contrast, broadband transmission allows signals to be sent in only one way.

5. Baseband transmission utilizes the bus topology. In contrast, broadband transmission utilizes both bus and tree topologies.

6. Baseband transmission contains a 50-ohm impedance. In contrast, broadband transmission contains a 70-ohm impedance.

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Q, NO 4: → What is the difference between a hub, modem, router, and a Switch?

Ans: → The main differences between hubs, switches, routers, and modem is the layer of the OSI model at which they operate and their specific functions. Hubs operate at the Physical layer, switches operate at the data layer, and modems operate at the Physical layer when converting digital signals to analog signals for transmission over communication channels.

Hubs and switches are used to connect devices to a local network, while routers are used to connect different networks together. Modems are used to connect devices to communication channels.

In terms of their capabilities, switches, and routers are more advanced than hubs and modem.

Hubs, switches, routers, and modems are all essential networking devices that play different roles in connecting devices to a network and enabling communication between different networks. Understanding the functions and differences between these devices can help you make informed decisions when setting up and managing your network.

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Whether you're a home user or a network administrator, having a basic understanding of these devices can help you troubleshoot network issues, improve network performance, and ensure reliable network connectivity.

QNo5:-> When you move the NIC cards from one PC to another PC, does the MAC address gets transferred as well?

Ans:-> Yes, that's 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 cards was replace by another one.

QNo6:-> When troubleshooting Computer network. Problems, what common ~~have~~ hardware-related problems can occur?

Ans:-> Most problems are hardware related, a faulty power cable or Power supply unit. Sometimes RAM needs to be upgraded or VGA cable is not properly connected.

Most of the time, the troubleshooting comes from cables (optical fibres included).

Q No 7: In a network that contains two servers and twenty workstations, where is the best place to install an Anti-virus program? (16)

Ans: A good firewall. This can stop instructions, malware, unauthorized access, etc. before they reach the workstations.

2. Antivirus Software on the servers and at the endpoint workstations. This software should be centrally managed to keep end users up-dated constantly and to minimize user meddling with the setting. Good antivirus will also protect email clients.

In a network that contains two servers and twenty workstations, the best place to install an Anti-virus is on the server. This is because the server is the main port for all the network traffic, and so it is more important to ensure that the server is free of and virus other security risks.

Q No 8: Define Static IP and Dynamic IP? Discuss the difference between IPv4 and IPv6.

Ans: The static IP meaning refers to an IP address that is assigned to a device and remains constant, as opposed to a dynamic IP address that changes each time the device connects to the internet. users assign

then to individual devices or resources. The address then applies for as long as user desires. (17)

Q No 9: Discuss TCP/IP model in details.

Ans: TCP/IP was designed and developed by the Department of Defense (DoD) in the 1960s and is based on standards protocol. 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 main work of TCP/IP is to transfer the data of a computer from one device to another. The main condition of this process is to make data reliable and accurate so that the receiver will receive the same information which is sent by the sender. To ensure that, each message reaches its final destination accurately, that the TCP/IP model divides its data into packets and combines them at the other end, which helps in maintaining the accuracy of the data while transferring from one end to another end.

Whenever we want to send something over the internet using the TCP/IP Model, the TCP/IP model divides the data into packets at the sender's end and the same packets have to

be recombined at the ¹⁸ receiver's end to form the same data, and this thing happens to maintain the accuracy of the data. TCP/IP model divides the data into a 4-layer procedure, where the data first go into this layer in one order and again in reverse order to get organized in the same way at the receiver's end.

Layers of TCP/IP Model

1. Application layer
2. Transport layer (TCP/^{UDP}IP).
3. Networking/Internet layer (IP).
4. Data link layer (MAC).
5. Physical layer.

Q No 10 → What is a web Browser (Browser)? Give some example of browsers.

Ans → A web browser is a type of software that allows you to find and view websites on the internet. Even if you didn't know it, you're using a web browser right now to read this page! There are many different web browsers, but some of the most common ones include Google Chrome, Safari, and Mozilla Firefox.

QNo11:-> what is a search engine? Give example? 19

Ans:-> A search engine is a web-based tool that enables users to locate information on the world wide web. Popular examples of search engines are Google, Yahoo!, and MSN Search.

QNo12:-> What is the Internet & WWW? What are the uses of internet in our daily life?

Ans:-> The world wide web is an information space of "the web," which is built on top of the internet, which is a massive network of computers communicating with each other; the "www" is to return the Internet Protocol (IP) address for a name server. For example, www.example.com could have an IP of 23.234.90.23. The user browses can then connect to the returned IP address of "example" name server has a listing for the "WWW" prefix. A name server simply translates name to an IP address.

There are many uses of the internet, however, the use of the internet in our daily life depends on individual requirements and goals.

- Uses of the Internet in Education
- Internet use to Speed up daily Tasks

- use of the Internet for ⁽²⁾ Shopping.
- Internet for Research & Development.
- Digital Transactions.
- Money management.

1. uses of the Internet in Education $\Rightarrow$ The internet is a great platform for students to learn throughout their lifetime. They can use the internet to learn new things and even acquire degrees through online education programs. Teachers can also use the internet to teach students around the world.

2. Internet use to Speed up Daily Tasks $\Rightarrow$

The internet is very much useful in our daily routine tasks. For example, it helps us to see our notifications and emails. Apart from this, people can use the internet for money transfers, shopping order online food, etc.

3. use of the Internet for Shopping $\Rightarrow$ with the help of the Internet, anybody can order products online. The increase in online shopping has also resulted in companies offering a huge discount for their customers.

4. Internet for Research & Development $\Rightarrow$ The internet plays a pivotal role in research and development as it is propelled through internet research.

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Ans The benefit of the internet is enjoyed by small businessmen to big universities.

5. Business Promotion and innovation $\Rightarrow$ The internet is also used to sell products by using various e-commerce solutions. The result is new services and businesses starting everyday thereby creating job opportunities and reducing unemployment.

6. Communication $\Rightarrow$ without a doubt, the internet is the most powerful medium of communication at present. It connects people across different parts of the world free and fast.

7. Digital Transaction $\Rightarrow$ The internet facilitates internet banking, mobile banking, and e-wallets. Since all digital transactions are stored in a database, it helps the government to track income tax details or income reports in the ITR.

8. Money Management $\Rightarrow$ The internet can also be used to manage money. Now, there are many websites, applications, and other tools that help us in daily transactions, transfers, management, budget, etc.

Ques $\Rightarrow$ What is an internet Service Provider? Give some example of ISP in India?

Ans $\Rightarrow$ An ISP (Internet Service Provider) is a company that provides individuals and organizations access to the internet and other related

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Services. An ISP has the equipment and the telecommunication line access required to have a point of presence on the internet for the geographic area served.

ISPs make it possible for customers to access the internet while also providing additional services such as email, domain registration and web hosting. ISPs may also provide different internet connection types, such as cable and fiber. Connections can also come in the form of high-speed broadband.

The Federal Communications Commission (FCC) states that to be considered high-speed, a connection must have download speeds of at least 25 megabits per second (Mbps) and upload speeds a minimum of 3 Mbps.

The example of some internet service providers are Hathway, BSNL, Tata Teleservices, Verizon, Reliance Jio, Airtel Fibernet and many more working in India as well as worldwide. Internet service providers or ISPs are responsible for providing services for using the internet.

Q No 14: → Discuss the difference between MAC address, IP address and port address?

Ans: → A MAC address is assigned to the network interface card by the manufacturer and is used

Ex. $\sum_{i=1}^n x_i$

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~~Interface~~ for Communication within the local area network - it is globally unique address.

An IP address is used for communication within the local area network and for communication between networks (usually through the internet).

Port numbers are used as part of IP communications to determine which program the communication is to or from.

This may be clearer if I relate it to the OSI (Open System Interconnect) model. This specifies 7 layers of communication. ~~The left column is a~~

The primary distinction between MAC and IP addresses is that MAC addresses are used to verify the computer's physical address. It uniquely identifies the network's devices. While IP addresses are used to uniquely identify a device's network connection, they do not indicate whether a device is connected to a network.

QNO15 → How do we view my internet browser's history?

Ans → View & delete your Chrome browsing history.

1. On your Android phone or tablet, open the Chrome app.

2. At the top right, tap More. History. If your address bar.

3. To visit a site, tap the entry. To open the sites in a new tab, touch and hold the entry. At the top right, tap More.

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How to Recover Chrome History / Bookmarks

1. Search Google History.
2. Click welcome to my Activity - Google.
3. Sign in to your Google account.
4. All of your browser / internet history files will be displayed along with the date / time.
5. Browse your history as needed.
6. Go to:
C:\users\user Name\AppData\Local\Google\Chrome\ Data.