CCA-102: Data Communications

ASSIGNMENT

1. **What are the different types of networks?**

Ans:

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

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

Ans: *Shielded twisted pair* is a special kind of copper telephone wiring used in some business installations. An outer covering or shield is added to the ordinary twisted pair telephone wires; the shield functions as a ground. To reduce crosstalk or electromagnetic induction between pairs of wires, two insulated copper wires are twisted around each other. Each signal on twisted pair requires both wires.

Unshielded twisted pair is a ubiquitous type of copper cabling used in telephone wiring and local area networks (LANs).Inside a UTP cable is up to four twisted pairs of copper wires, enclosed in a protective plastic cover, with the greater number of pairs corresponding to more bandwidth. The two individual wires in a single pair are twisted around each other, and then the pairs are twisted around each other, as well. This is done to reduce crosstalk and electromagnetic interference, each of which can degrade network performance. Each signal on a twisted pair requires both wires.

3. **What is difference between baseband and broadband transmission?**

Ans: *Baseband transmissions:* Baseband transmissions typically use digital signaling over a single wire; the transmissions themselves take the form of either electrical pulses or light. The digital signal used in baseband transmission occupies the entire bandwidth of the network media to transmit a single data signal. Baseband communication is bidirectional, allowing computers to both send and receive data using a single cable. However, the sending and receiving cannot occur on the same wire at the same time.

Broadband transmission: Whereas baseband uses digital signaling, broadband uses analog signals in the form of optical or electromagnetic waves over multiple transmission frequencies. For signals to be both sent and received, the transmission media must be split into two channels. Alternatively, two cables can be used: one to send and one to receive transmissions. Multiple channels are created in a broadband system by using a multiplexing technique known as Frequency-Division Multiplexing (FDM). FDM allows broadband media to accommodate traffic going in different directions on a single media at the same time.

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

Ans: *Hub* is a network hardware device for connecting multiple Ethernet devices together and making them act as a single network segment. It has multiple input/output (I/O) ports, in which a signal introduced at the input of any port appears at the output of every port except the original incoming. A hub works at the physical layer (layer 1) of the OSI model.

Modem – a portmanteau of "modulator-demodulator" – is a hardware device that converts data from a digital format, intended for communication directly between devices with specialized wiring, into one suitable for a transmission medium such as telephone lines or radio. A modem modulates one or more carrier wave signals to encode digital information for transmission, and demodulates signals to decode the transmitted information.

Router is a networking device that forwards data packets between computer networks. Routers perform the traffic directing functions on the Internet. Data sent through the internet, such as a web page or email, is in the form of data packets. A packet is typically forwarded from one router to another router through the networks that constitute an internetwork .

5. **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 card was replace by another one.

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

Ans: A large percentage of a network is made up of hardware. Problems in these areas can range from malfunctioning hard drives, broken NICs and even hardware startups. Incorrectly hardware configuration is also one of those culprits to look into.

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

Ans:The best solution is to install anti-virus on all the computers in the network. This will protect each device from the other in case some malicious user tries to insert a virus into the servers or legitimate users.

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

Ans:

Static IP Address	*Dynamic IP address*

It is provided by ISP(Internet Service Provider).	While it is provided by DHCP (Dynamic Host Configuration Protocol).
Static ip address does not change any time, it means if a static ip address is provided then it can't be changed or modified.	While dynamic ip address change any time.
Static ip address is less secure.	While dynamic ip address is less stable than static ip address.
Static ip address is difficult to designate	While dynamic ip address is easy to designate.
It is used where computational data is less confidential.	While it is used where data is more confidential and needs more security.

IPV4	*IPV6*
IPv4 has 32-bit address length	IPv6 has 128-bit address length
It Supports Manual and DHCP address configuration	It supports Auto and renumbering address configuration
In IPv4 end to end connection integrity is Unachievable	In IPv6 end to end connection integrity is Achievable
Address representation of IPv4 is in decimal	Address Representation of IPv6 is in hexadecimal
Fragmentation performed by Sender and forwarding routers	In IPv6 fragmentation performed only by sender

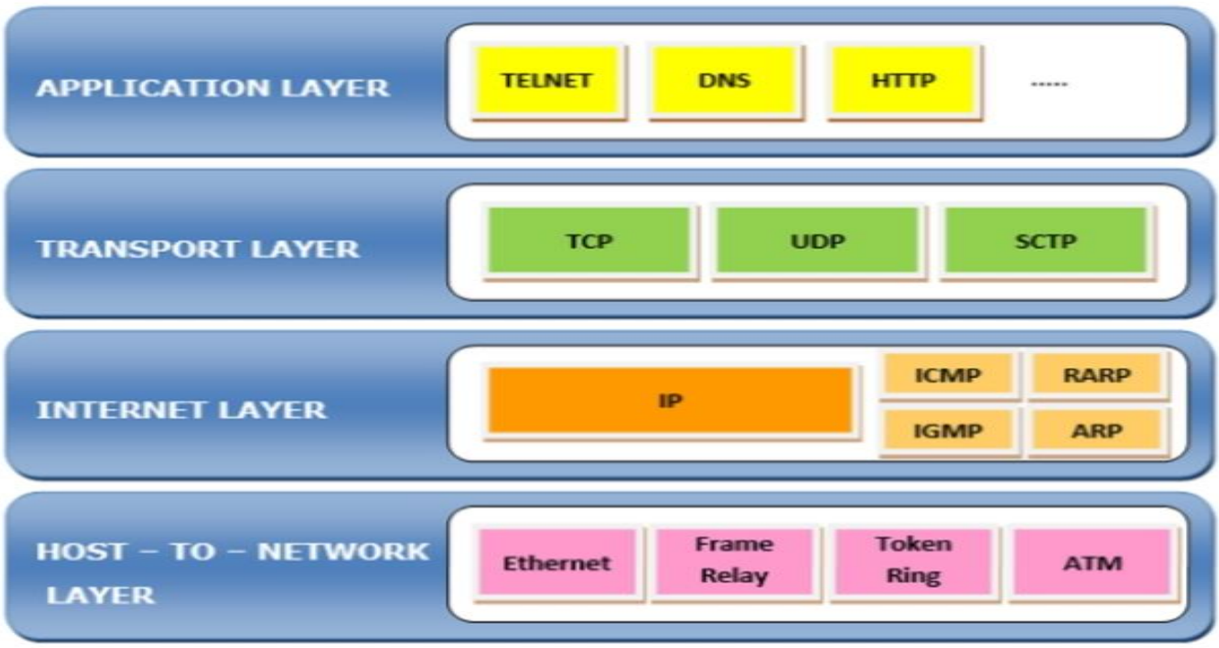
9. Discuss TCP/IP model in detail.

Ans: TCP/IP Reference Model is a four-layered suite of communication protocols. It was developed by the DoD (Department of Defense) in the 1960s. It is named after the two main protocols that are used in the model, namely, TCP and IP. TCP stands for Transmission Control Protocol and IP stands for Internet Protocol.

The four layers in the TCP/IP protocol suite are –

- Host-to- Network Layer
- Internet Layer
- Transport layer
- Application layer

The following diagram shows the layers and the protocols in each of the layers –



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

Ans: A web browser, or simply "browser," is an application used to access and view websites. Common web browsers include Microsoft Internet Explorer, Google Chrome, Mozilla Firefox, and Apple Safari.

11.What is a search engine? Give example.

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.

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

Ans: Internet is the network of networks connect through different computers.

WWW stands for World Wide Web.

Top uses of the Internet:-

- Electronic mail. At least 85% of the inhabitants of cyberspace send and receive e-mail. Some 20 million e-mail messages cross the Internet every week.
- Research.
- Downloading files.
- Discussion groups. These include public groups, such as those on Usenet, and the private mailing lists that ListServ manages.
- Interactive games.
- Education and self-improvement. On-line courses and workshops have found yet another outlet.
- Friendship and dating. You may be surprised at the number of electronic "personals" that you can find on the World Wide Web.
- Electronic newspapers and magazines. This category includes late-breaking news, weather, and sports. We're likely to see this category leap to the top five in the next several years.

- Job-hunting. Classified ads are in abundance, but most are for technical positions.
- Shopping. It's difficult to believe that this category even ranks. It appears that "cybermalls" are more for curious than serious shoppers.

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

Ans: An Internet Service Provider (ISP) is a company such as AT&T, Verizon, Comcast, or Bright House that provides Internet access to companies, families, and even mobile users. ISPs use fiber-optics, satellite, copper wire, and other forms to provide Internet access to its customers.

Examples:

- Reliance jio
- Airtel
- BSNL
- Vodafone

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

Ans:

MAC address: A media access control address (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. This use is common in most IEEE 802 networking technologies, including Ethernet, Wi-Fi, and Bluetooth.

IP address: An Internet Protocol address (IP address) is a numerical label assigned to each device connected to a computer network that uses the Internet Protocol for communication. An IP address serves two main functions: host or network interface identification and location addressing.

Port address: A port number is the logical address of each application or process that uses a network or the Internet to communicate. A port number uniquely identifies a network-based application on a computer. Each application/program is allocated a 16-bit integer port number. This number is assigned automatically by the OS, manually by the user or is set as a default for some popular applications.

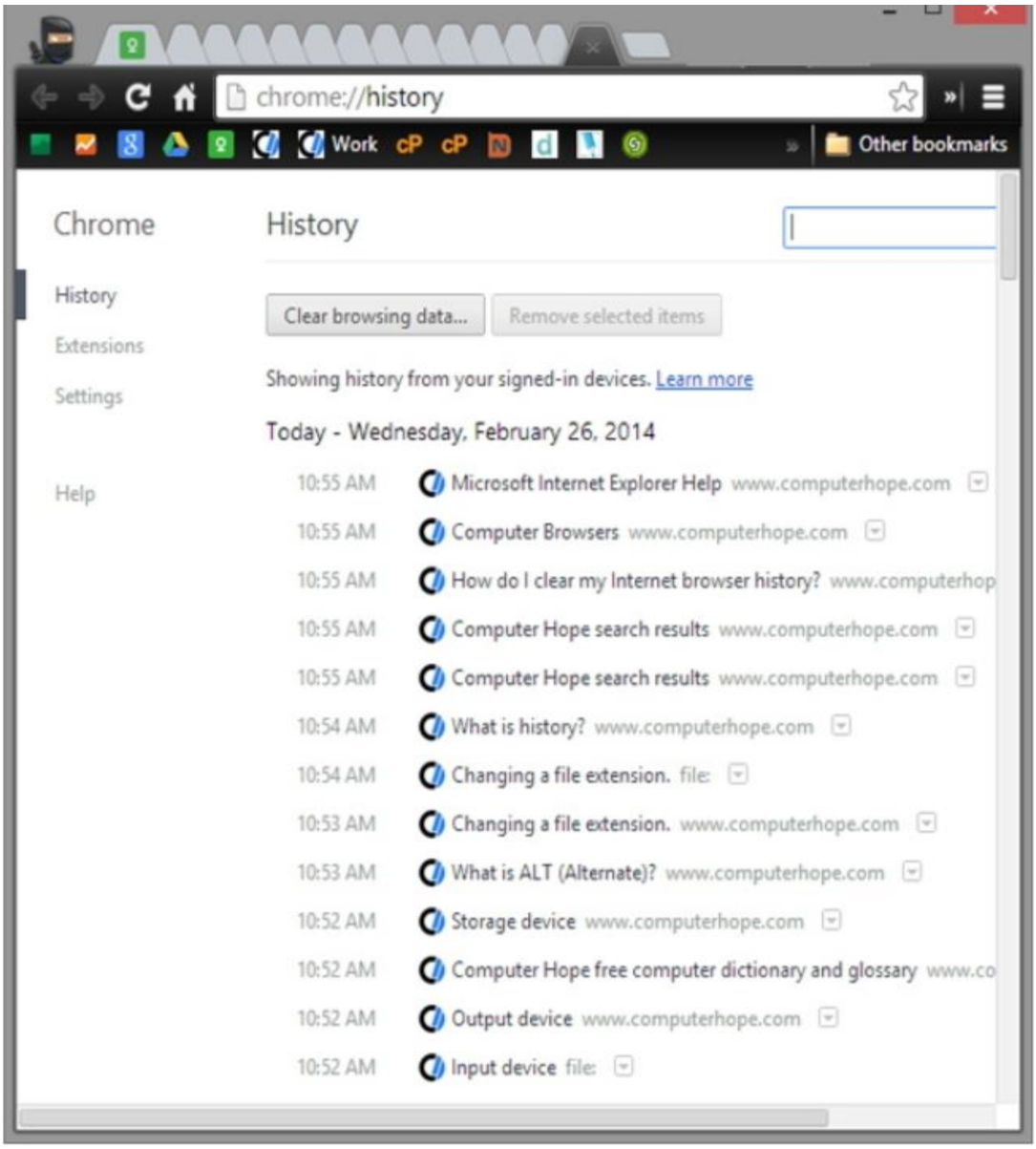
15. How do we view my Internet browser's history?

Ans: If you are using Windows, Linux, or macOS, there are quick shortcut key combinations that allow you to view your history.

Windows and Linux users: Ctrl+H

Apple users: Command + Shift + H

Once one of the above shortcut keys is pressed, a history section similar to the example below should appear. In the following screenshot, browsing history is being viewed in Google Chrome.


chrome://history
Work
Other bookmarks
Chrome
History
Extensions
Settings
Help
History
Clear browsing data...
Remove selected items
Showing history from your signed-in devices. Learn more
Today - Wednesday, February 26, 2014
10:55 AM Microsoft Internet Explorer Help www.computerhope.com
10:55 AM Computer Browsers www.computerhope.com
10:55 AM How do I clear my Internet browser history? www.computerhop
10:55 AM Computer Hope search results www.computerhope.com
10:55 AM Computer Hope search results www.computerhope.com
10:54 AM What is history? www.computerhope.com
10:54 AM Changing a file extension. file:
10:53 AM Changing a file extension. www.computerhope.com
10:53 AM What is ALT (Alternate)? www.computerhope.com
10:52 AM Storage device www.computerhope.com
10:52 AM Computer Hope free computer dictionary and glossary www.co
10:52 AM Output device www.computerhope.com
10:52 AM Input device file: