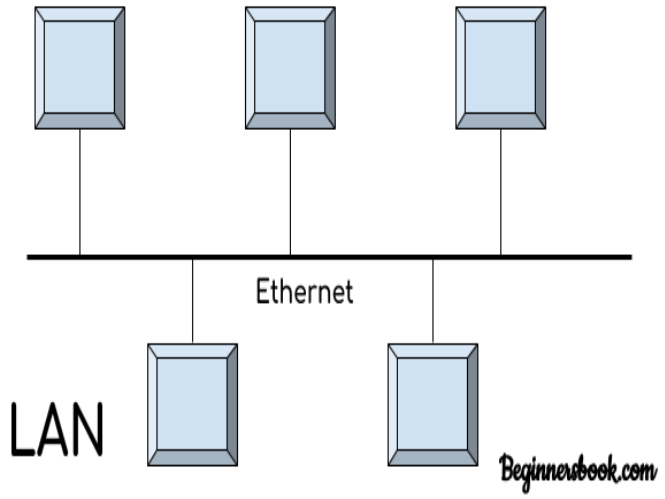
CCA-102: Data Communications
ASSIGNMENT

Q 1. What are the different types of networks?

Ans. The **Network** allows computers to connect and communicate with **different** computers via any medium. LAN, MAN and WAN are the three major **types** of the **network** designed to operate over the area they cover.

There are mainly three types of computer networks based on their size:
1. Local Area Network (LAN)
2. Metropolitan Area Network (MAN)
3. Wide area network (WAN)

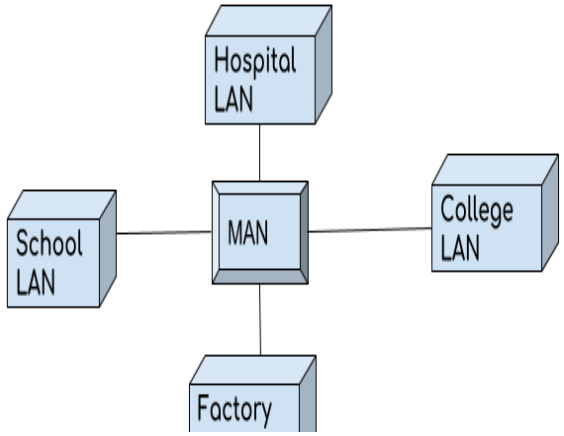
1. Local Area Network (LAN)



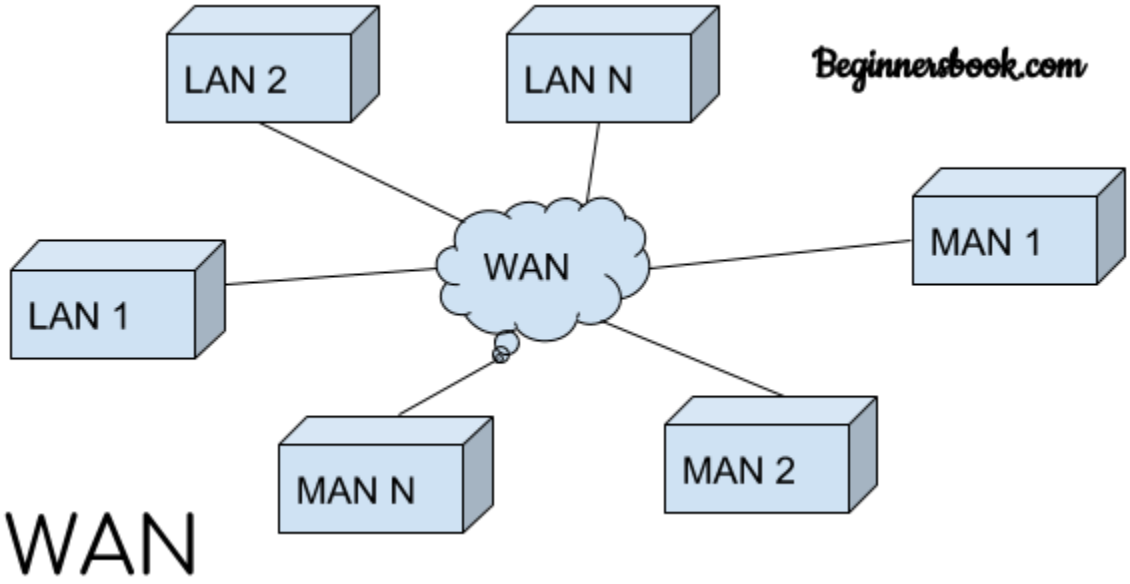
1. Local area network is a group of computers connected with each other in a small places such as school, hospital, apartment etc.
2. LAN is secure because there is no outside connection with the local area network thus the data which is shared is safe on the local area network and can't be accessed outside.
3. LAN due to their small size are considerably faster, their speed can range anywhere from 100 to 100Mbps.
4. LANs are not limited to wire connection, there is a new evolution to the LANs that allows local area network to work on a wireless connection.

2. Metropolitan Area Network (MAN)

MAN network covers larger area by connections LANs to a larger network of computers. In Metropolitan area network various Local area networks are connected with each other through telephone lines. The size of the Metropolitan area network is larger than LANs and smaller than WANs(wide area networks), a MANs covers the larger area of a city or town.



3. Wide area network (WAN)



WAN

Wide area network provides long distance transmission of data. The size of the WAN is larger than LAN and MAN. A WAN can cover country, continent or even a whole world. Internet connection is an example of WAN. Other examples of WAN are mobile broadband connections such as 3G, 4G etc.

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

Ans.

BASIS FOR COMPARISON	UTP	STP
Basic	UTP (Unshielded twisted pair) is a cable with wires that are twisted together.	STP (Shielded twisted pair) is a twisted pair cable enclosed in foil or mesh shield.
Noise and crosstalk generation	High comparatively.	Less susceptible to noise and crosstalk.
Grounding cable	Not required	Necessarily required
Ease of handling	Easily installed as cables are smaller, lighter, and flexible.	Installation of cables is difficult comparatively.
Cost	Cheaper and does not require much maintenance.	Moderately expensive.
Data Rates	Slow comparatively.	Provides high data rates

Q3. What is difference between baseband and broadband transmission?

Ans. Baseband

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

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.

Q4. What is the difference between a hub, modem, router and a switch?

Ans.

- **Hubs** are “dumb” devices that pass on anything received on one connection to all other connections.
- **Switches** are semi-intelligent devices that learn which devices are on which connection.
- **Routers** are essentially small computers that perform a variety **of** intelligent tasks.

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

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

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

Ans. The network consists of hardware, problems can vary from a defective network card or hard drive malfunctioning, a bad starting materials or incorrect configuration

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

Ans. We need AT LEAST three levels of security.

1. A good firewall. This can stop intrusions, 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 updated constantly and to minimize user meddling with the settings. Good antivirus will also protect email clients.
3. Educated and aware users who: do not casually install downloaded programs; don't click on unknown links; don't fall for phishing emails, etc. Establish a strong password policy for all users. You should consider not giving your users Administrative rights on their accounts. They will complain that they cannot install what they need and your workload will increase but, I guarantee you, your entire environment will be more reliable and secure.

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

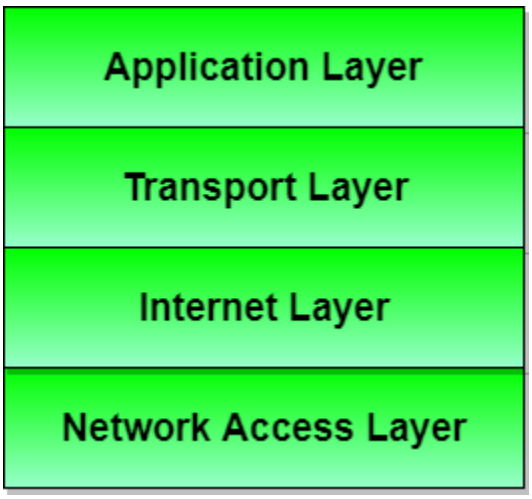
Ans. When a device **is** assigned a **static IP** address, the address does not change. Most devices use **dynamic IP** addresses, which are assigned by the network when they connect and change over time.

Difference between Static and Dynamic IP address:

S.NO	STATIC IP ADDRESS	DYNAMIC IP ADDRESS
1.	It is provided by ISP(Internet Service Provider).	While it is provided by DHCP (Dynamic Host Configuration Protocol).
2.	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.
3.	Static ip address is less secure.	While in dynamic ip address, there is low amount of risk than static ip address's risk.
4.	Static ip address is difficult to designate.	While dynamic ip address is easy to designate.
5.	The device designed by static ip address can be trace.	But the device designed by dynamic ip address can't be trace.
6.	Static ip address is more stable than dynamic ip address.	While dynamic ip address is less stable than static ip address.
7.	The cost to maintain the static ip address is higher than dynamic ip address.	While the maintaining cost of dynamic ip address is less than static ip address.

Q 9. Discuss TCP/IP model in detail.

Ans. The **TCP**/**IP** Reference **Model**. **TCP**/**IP** means Transmission Control **Protocol** and Internet **Protocol**. It is the network **model** used in the current Internet architecture as well. Protocols are set of rules which govern every possible communication over a network.



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

Ans. There are many different web browsers, but some of the most common ones include **Google Chrome**, **Internet Explorer**, Safari, Microsoft Edge, and **Mozilla Firefox**.

Q 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**.

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

Ans. The **Internet** innovated **our daily life**. ... Positive use of the **Internet** makes **our lives** easy and simple. The **Internet** provides us useful data, information, and knowledge for personal, social, and economic development and it is up to us to utilize **our** time on the world wide **web** in a productive manner.

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

Ans. Today, if you use the phone, the tv (cable tv, YouTube, Netflix), PC to search and tablets for social media, smart watch, the access providers are all essentially ISPs. With the exception of radio and tv (a sizeable percentage are still over-the-air) and cable tv (old tech still being used to deliver movies) - they'll take a little longer, but all means of delivery are now made by ISPs.

Rank	ISP	Narrowband	Broadband	Total
1	Jio	0	138,615,904	138,615,904
2	Airtel	32,008,751	62,294,731	94,303,482
3	Vodafone	21,736,495	45,975,013	67,711,508
4	Idea Cellular	8,589,570	29,614,167	38,203,737
5	BSNL	10,915,589	21,242,487	32,158,076
6	Reliance Communications	10,697,647	5,523,074	16,220,721
7	Aircel	7,142,722	9,073,153	16,215,875
8	Tata Teleservices	4,690,205	4,316,099	9,006,304
9	Telenor India	7,969,328	331,339	8,300,667
10	MTNL	484,517	1,408,903	1,893,420

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

Ans. The main **difference between MAC** and **IP address is** that, **MAC Address is** used to ensure the physical **address of** computer. It uniquely identifies the devices **on a** network. While **IP address** are used to uniquely identifies the connection **of** network with that device take part **in a** network.

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

Ans. To **view the** web **history** in Google Chrome, click to open **the** menu ⍰ at **the** top-right of its window and select **History**, then click **History** a second time. Or press Ctrl+H on your keyboard. This shows **the** web **history** as a list of pages, organised by time and date, in **the** current tab.