

CCA-102

ASSIGNMENT

ON

DATA

COMMUNICATIONS.

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Q1. What are the different types of Networks?
Ans => The different types of Networks are as follows:

- 1> LAN (Local Area Network).
- 2> WAN (Wide Area Network).
- 3> WLAN (Wireless Local Area Network).

1. LAN (Local Area Network):

- > LAN is usually privately owned and links the devices in a single office, building or campus.
- > Depending on the needs of an organisation and the type of technology used, a LAN can be as simple as two PCs and a printer in someone's home office; or it can extend through out a company and include audio and video peripherals.
- > Currently, LAN size is limited to a few kms.
- > LANs are designed to allow resources to be shared between personal computers or workstations.
- > LANs are distinguished from other types of networks by their transmission media and topology.
- > The most common LAN topologies are bus, ring and star.

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-> Early LANs had data rates in the 4 to 16 Mbps range. Today, however, speeds are normally 100 or 1000 Mbps.
-> Ethernet (IEEE 802.3) is one example of LAN which has evolved over the years.

2. WAN (Wide Area Network):

-> A Wide Area Network (WAN) provides long-distance transmission of data, images, audio and video information over large geographic areas that may comprise a country, a continent, or even the whole world.

-> A WAN can be as complex as the backbone that connect the Internet or as simple as a dial-up line that connects a home computer to the Internet.

-> We normally refer to the first as a switched WAN and to the second as a point-to-point WAN.

o> The switched WAN connects the end systems, which usually comprise a router (Internet-working connecting device) that connects to another LAN or WAN.

o> The point-to-point WAN is normally a line leased from a telephone or cable TV provider that connects a home computer or a small LAN to an Internet Service provider (ISP). This type of WAN is often used to provide Internet access.

3. WLAN (Wireless Local Area Network):

A wireless LAN is a wireless computer network that links two or more devices using wireless communication to form a local area network within a limited area such as a home, school, computer laboratory, campus, or office building.

IEEE has defined the specifications for a wireless LAN, called IEEE 802.11, which covers the physical data link layers.

Q2. Explain the Shielded twisted pair (STP) and Unshielded twisted pair (UTP):

Ans => The Shielded twisted pair (STP):

In STP grounding cable is required but in UTP grounding cable is not required, in Shielded Twisted Pair (STP) much more maintenance are needed therefore it is costlier than Un-shielded Twisted Pair (UTP).

The Unshielded twisted pair (UTP):

UTP is the type of twisted pair cable. Both data and voice both are transmitted through UTP because its frequency range is suitable. In UTP grounding cable is not necessary also in UTP much more maintenance are not needed therefore it is cost effective.

Q3. What is difference between baseband and broadband transmission?

Ans → The difference between baseband and a broadband transmission are as follows:-

Baseband transmission:

- Digital signals are used
- Frequency division multiplexing is not possible.
- Short distance signal travelling
- Entire bandwidth of the cable is consumed by a ~~single~~ single signal in a baseband transmission

Broadband transmission:

- Analog signals are used
- Frequency division multiplexing is possible.
- Signal travelling distance is long
- The signals are sent on multiple frequencies and allow all the multiple signals are sent simultaneously in broadband transmission

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

Ans → The Hub:

Passive hubs:

- These hubs which operate below the physical layer are passive hub.
- A passive hub is just a connector. It connects the wire coming from different branches.
- It simply redirect the traffic on the connected machine.

Active hubs or repeater:

- Active hubs or a multipoint repeaters operate only at the physical layer. It forwards each received frame, and can't filter traffic.
- Signals that carry information within a network can travel a fixed distance before attenuation endangers the integrity of the data.
- A repeater receives a signal and, before it becomes too weak or corrupted, amplify and regenerates the original bit pattern.
- The repeater then sends the reshaped signal.
- A repeater can extend the physical length of a LAN.

Modem: A modem is a network hardware device that modulates one or more carrier wave signals to encode digital information for transmission and demodulates signals to decode the transmitted information. It is a connecting device that converts between analog and digital signals in real time for a two-way communication.

1. modulation and
2. demodulation.

Router:

- Routers are conceptually similar to bridges, except that they are found in the network layer.
- They just take incoming packets from one line and forward them on another, just as all routers do, but the lines may belong to different network and use different protocols.
- The router is a layer-3 device that routes packets based on their logical addresses.
- A router normally connects LANs and WANs in the Internet and has a routing table that is used for making decisions about the route.
- The routing tables are normally dynamic and are updated using routing protocols.

Switches:

- When we use the term switch, we must be careful because a switch can mean two different things.
- We must clarify the term by adding the level at which the device operates.
- We can have a layer 2 switch or a layer 3 (L3) switch.
- The L3 switch performs up to the network layer, and is called router.
- The L2 switch performs up to data link layer.
- A L2 switch is a bridge.
- A L2 switch, as a bridge does, makes a filtering decision based on the MAC address of the frame it received.
- A L2 switch can have a buffer to hold the frames for processing.
- It can have a switching factor that forwards the frames faster.
- A L3 switch is a router, but a faster and more sophisticated.
- The switching fabric in an L3 switch allow faster table look up and forwarding.
- L3 switch and router is synonymous.

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Q5. 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 another one replaced the NIC card.

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Q6. When trouble shooting computer network problems, what common hardware-related problems can occur?

Ans ⇒ Most common hardware related problems are PoBx, LAN card, WLAN card and Wi-Fi AP if it is wireless, Cables, Switches, Routers and Wireless Controllers.

Display Problem? (Monitor).

VGA Problem, Monitor Power Cable Problem, Monitor Problem.

Display Problem? (RAM)

- Check RAM
- Check RAM Slot.

Power on Problem.

- Check SMPS
- Power Cables.

Motherboard Drivers Problem

- Check drivers
- If there is no drivers we can install drivers.

Operating System Installations Problem

- Check Operating System disk.
- Check Hard disk.

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Q7. In a network that contains two servers and twenty workstations, where is the best place to install an anti-virus program?

Ans ⇒ Antivirus should be on each computer, if you implement server and node base anti-virus that will be best for controlling.

There are no special problems just because you are two server and twenty computers. Every general issue will come along with critical. It will be same as any other computer set up issue.

Antivirus software on the servers and at the endpoint workstations. This software should be centrally managed to keep and users updated constantly and to minimize users meddling with the settings. Good antivirus will also protect email clients.

Anti-virus on all devices, servers, and workstations.

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Q8. Define static IP and Dynamic IP? Discuss the difference between IPv4 and IPv6.

Ans ⇒ Static IP:

A static IP Address is assigned by request and for the fee by an IT administrator at work, or by users at home. Here are the advantages of a static IP Address:

- Business are better suited for it than residence.
- It's also better for dedicated services such as mail, FTP and VPN servers.
- It's good for creating or hosting computer server.
- It makes it easier for geolocation services to accurately assess where we are.

Dynamic IP:

It doesn't cost us anything extra. It's carefree, automatic and reliable with little work on your end. Geolocation might be less accurate, if that matters to us. For our ISP, it's the most efficient use of IP Address.

The difference between IPv4 and IPv6 are as follows:

IPv4:

→ IPv4 is the current version (not for long) of IP.

addresses.

- 32-bit numeric address written as four numbers separated by periods.
66. 94. 234. 13.
- Number range is from 0-255.
- Computers and networks don't read IP addresses in this standard numeric format.
- They only understand numbers in a binary format. 66. 94. 234. 13.

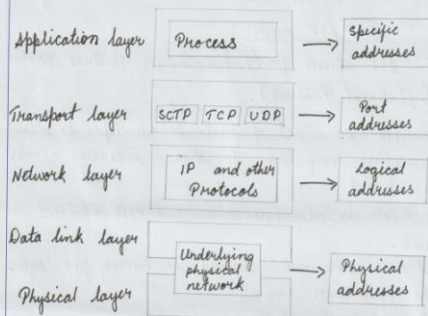
IPv6:

- IPv6 is the next generations of IP addresses.
- 128-bit hexadecimal address.
- Hexadecimal uses both numbers and alphabets.
F6EC:4F59:34CF:F1CD:9DC6:89CD:45E6:67A2.

59. Discuss TCP/IP model in detail.

Ans ⇒ TCP/IP model:

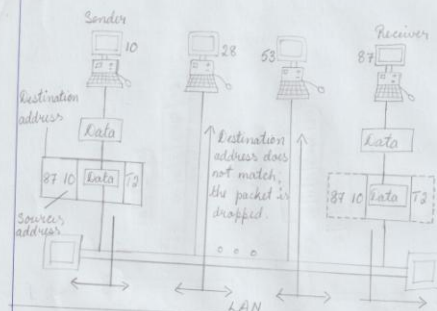
- TCP/IP stands for (Transmission Control Protocol / Internet Protocol).
- TCP/IP is a set of protocols developed to allow cooperating computers to share resources across the network.
- TCP/IP is also known as a TCP/IP Protocol Suite.
- It was originally defined as having five layers.
 1. Application layer.
 2. Transport layer.
 3. Network layer.
 4. Data link layer. (host-to-network).
 5. Physical network.
- The TCP/IP model, it was designed and developed by the United States Department of Defense in 1960s and is based on standard protocols.
- The figure below shows the comparison of TCP/IP model and OSI network models:

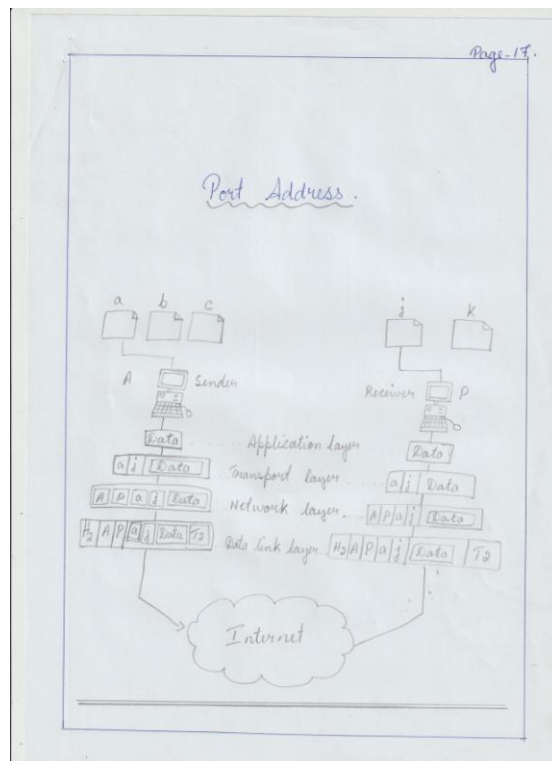
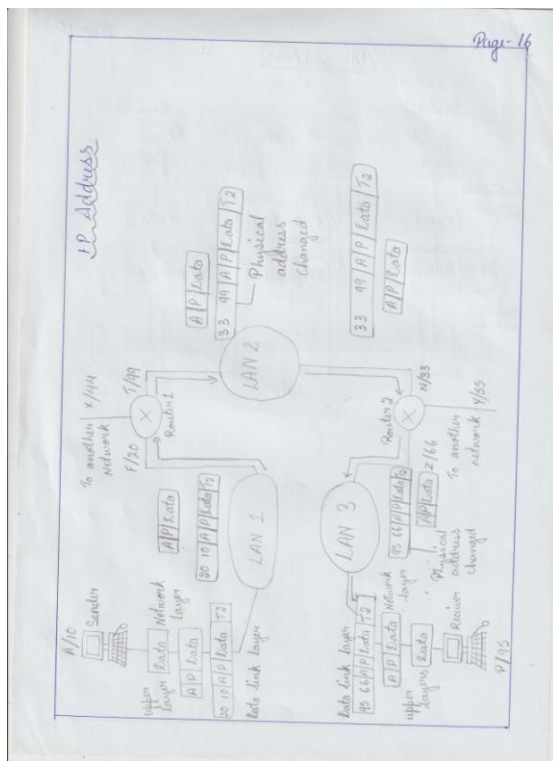


Address in TCP/IP model:

1. MAC Address
2. IP Address
3. Port Address.

MAC Address:





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Q10. What is a Web Browser (Browser)? Give some example of browsers.

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

Some example of browsers are.

- Internet Explorer.
- Google Chrome.
- Mozilla Firefox
- Opera.

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Q11. What is a Search engine? Give example.

Ans ⇒ A Search engine is a web-based tool that enables users to ~~locate~~ locate information on the World Wide Web.

Some examples of search engine are:

- Google, Yahoo!, and MSN Search.

Google is the most used search engine world wide with a 92 percent market share in mid-2019. Google may be one of the most popular search engines but there are many more alternative search engines available for users.

Q12. What is the Internet and WWW? What are the uses of internet in our daily life?

Ans => Today, the internet has become unavoidable in our daily life. Appropriate use of the internet makes our life easy, fast and simple. The internet helps us with facts and figures, information and knowledge for personal, social and economic development.

The World Wide Web (known as "WWW", "Web" or "W3") is the universe of network-accessible information, the embodiment of human knowledge. The World Wide Web began as a networked information project at CERN, where Tim Berners-Lee, now Director of the World Wide Web Consortium [W3C], developed a vision of the project.

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 shopping.
- > Internet for Research and Development.
- > Digital Transactions.
- > Money Management.
- > Electronic mail.
- > Downloading files.
- > Discussion groups.
- > Friendship and dating.
- > Electronic newspapers and magazines.