CCA - 102:

Data Communication P-1

Q1. What are the different types of networks?

Ans The different types of networks are:

① Personal Area Network (PAN)
② Local Area Network (LAN)
③ Wide Area Network (WAN)
④ Wireless Local Area Network (WLAN)
⑤ Campus Area Network (CAN)
⑥ Metropolitan Area Network (MAN)
⑦ Storage Area Network (SAN)
⑧ System - Area Network (SAN)
⑨ Passive Optical Local Area Network (POLAN)
⑩ Enterprise Private Network (EPN)
⑪ Virtual Private Network (VPN)
⑫ Home Area Network (HAN)

Q2. Explain the shielded twisted pair (STP) and Unshielded twisted Pair (UTP)

ns Shielded twisted - Pair (STP) cable has a metal foil or braided -mesh covering that encases each pair of insulated conductors as shown in figure.

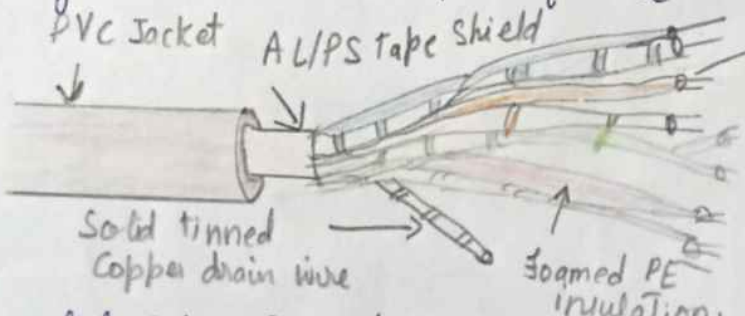

Fig. 1

The metal casing prevents the penetration of electromagnetic noise. It also can eliminate the phenomenon called crosstalk. which is the undesired effect of one circuit (or channel) on another circuit (or channel)? It occurs when one line pickup some of signals travelling down another line. This effect can be experienced during tele-

phone conversation when one can hear other conversations in the background. To eliminate this effect shielding is used for each twisted pair cable.

Shield Twisted - pair cable has the same quality consideration and uses the same connectors as unshielded twisted - pair cable, but the shield must be connected to a ground. Materials and manufacturing requirements make STP more expensive than UTP but less susceptible to noise.

Unshielded Twisted Pair (UTP) Cable is the most general type of telecommunication medium which is mostly used. Although most familiar from its use in telephone System, its frequency range is suitable for transmitting both data and voice. A twisted pair consists of two conductors, generally copper, each with its own colored plastic insulation. The Plastic insulation is colour - banded for identification shown in this figure 2. colours ~~(- banded for identificat)~~ are used both to identify the specific conductors in a cable end to indicate which wires belong in pairs and how they relate to other pairs in a large bundle.

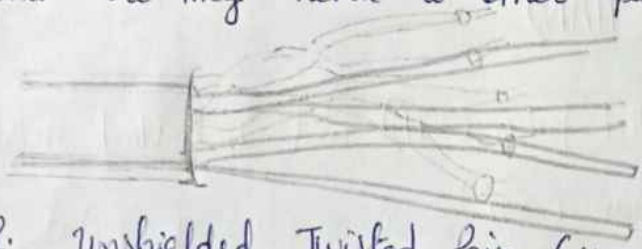

Fig 2. Unshielded Twisted Pair (UTP) Cable.

Q3. What is the difference between baseband and broadband transmission?

Ans The difference between baseband and broadband transmission:

Sl. no	Basis of Comparison	Baseband Transmission	Broadband Transmission
(1)	Definition	It is a data transmission technique in which one signal needs the whole bandwidth of the channel to transfer the data.	It is a transmission technology in which many signals with different frequencies send data across a single channel at the same time.
(2)	Signal Type	It utilizes digital signals	It utilizes analog signals.
(3)	Signal Transmission	The signals may be transmitted in both directions	The signals may transmitonly one direction.
(4)	Direction Type	It is bidirectional in nature.	It is unidirectional in nature.
(5)	Multiplexing	It uses Time Division Multiplexing (TDM).	It uses frequency Division Multiplexing (FDM)
(6)	Topology	It operates with bus Topology.	It operates with both bus and tree Topology.
(7)	Number of channels	It utilizes the same channel for sending and receiving data.	It utilizes two channels, one for transmission and the second for data reception.
(8)	Distance Covered	Signals are only capable of travelling limited distances. Attenuation is needed for long distances.	Signals may be transmitted across long distances without attenuation.
(9)	Installation and Maintenance	It is simple and easy to install and maintain	It is complex to install and maintain

(10)	Cost	It is less expensive to design.	It is costly to design.
(11)	Encoding Technique	Manchester and differential Manchester encoding are used in baseband.	It doesn't utilize any digital encoding, but it utilizes the Phase Shift Keying (PSK) encoding.
(12)	Impedance	It contains a 50 - ohm impedance.	It contains a 10 - ohm impedance.
(13)	Transfer Medium	It utilizes coaxial cables, fibres and twisted-pair cables as the transfer medium for digital signals.	It sends digital signals via coaxial cable, optical fibre cables, and radio waves.
(14)	Application	It is usually found in Ethernet.	It is usually found in telephone networks and cables.

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

Ans

Hub	Modem	Router	Switch
① Hubs are devices used in networking that connect a number of different devices to one another.	A modem is a device that take digital information and transforms it into analog digital signals that may be sent via wires.	A Router is a networking device that operates under the network layer of the OSI model and is used to connect two or more networks.	A Switch is a multicast networking device that works under the Datalink layer of the OSI model and connects a bunch of computers or devices in a network. It's mainly used to send a private message and it does not waste data.

(2)	Hub is a Broadcast Device	Modem is an electro nic device.	Router is a routing device used to create route for transmitting data packets	Switch is Multi cast Device
(3)	Hub send data in the form of binary bits	Modem send and receive data through a telephone line or cable connection	Router sends data in the form packets.	Switch sends data in the form of frames.
(4)	Hub only works in half duplex	Modem works in full duplex.	Router works in full duplex.	Switch works in full duplex
(5)	only one device can send data at a time	Multiple devices can send data at the same time.	Multiple devices can send data at the same time.	Multiple devices can send data at the same time

Q.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.

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

Ans When troubleshooting computer network problems, the following points are the common hardware related problems can occur.

(1) Unexpected Shutdowns.
(2) System lockups.
(3) POST code beeps.
(4) Blank Screen on boot up.
(5) BIOS time and settings resets.
(6) Attempts to boot to incorrect device.
(7) Continuous reboots
(8) No Power.
(9) Overheating.
(10) Loud noise

(11) Intermittent device failure.
(12) Fans Spin.
(13) Indicator lights.
(14) Smoke
(15) Burning Smell
(16) BSOD -> Blue Screen of Death
(17)

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

Ans An Anti-Virus Program must be installed on all servers and workstations to ensure protection. That's because individual users can access any workstation and introduce a computer virus when plugging in their removable hard drives or flash drives.

Q8. Define Static IP and Dynamic IP? Discuss the difference between IPV4 and IPV6.

Ans A static IP address is an IP address that always stays the same. If you have a web server, FTP Server, or other internet resource that must have an address that cannot change, you can get a static IP address from your ISP. A static IP address is usually more expensive than a dynamic IP address, and some ISPs do not supply static IP addresses.

A Dynamic IP address is an IP address than an ISP lets you use temporarily. If a dynamic address is not in use, it can be automatically assigned to a different device. Dynamic IP addresses are assigned using either DHCP or PPPoE.

Features	Static IP address	Dynamic IP address.
Definition	It is a permanent numeric address that is manually issued to a network device.	It is a temporary IP address allocated to a system when it connects to a network.

Provider	It is provided by Internet Service Provider (ISP)	It is provided by DHCP (Dynamic Host Configuration Protocol).
Changes	It doesn't change with time.	It may be changed at any time.
Device tracking	Devices may be traced easily.	Devices may be difficult to trace.
Cost.	It is expensive to utilize and maintain.	It is less expensive to utilize and maintain.
Security	It is less secure than the dynamic IP address.	It offers high security.
Designation	It is complex to assign and reassign.	It is much easy to assign and reassign.
Stability	It is highly stable	It is less stable.
Usage	These are appropriate for dedicated services like FTP, mail, and VPN servers.	Dynamic IP addresses are appropriate for a large network that needs an internet connection for all devices.

Q9. Discuss TCP/IP model in detail.

Ans = TCP/IP Stands for Transmission Control Protocol / Internet Protocol and is a suite of communication protocols (and it) used to interconnect network devices on the internet. TCP/IP is also used as a communications protocol in a private computer network (an intranet or extranet).

Common TCP/IP Protocols include the following :

- Hyper Text Transfer Protocol (HTTP) handles the communication between a web server and a web browser.
- HTTP Secure handles secure communication between a web server and a web browser
- file Transfer Protocols handles transmission of files between computers

TCP/IP uses the client server model of communication in which a user or machine (a client) is provided a service, like sending a webpage, by another computer (a server) in the network. There are 4 layers of the TCP/IP model.

(1) The application layer (2) the transport layer (3) the network layer (4) the physical layer.

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

Ans. A Web Browser is application software for accessing websites. When a user requests a web page from a particular website, the browser retrieves its files from a web server and then displays the page on the user's screen.

Examples Microsoft Edge, Internet Explorer, Google chrome, Mozilla firefox and Apple Safari.

Q 11. What is Search engine? Give example.

Ans A Search engine is a software program that helps people find the information they are looking for online using keywords or phrases. Search engines are able to return results quickly - even with millions of websites online - by scanning the internet continuously and indexing every page they find. A Search engine is a web-based tool that enables users to locate information on the world wide web. Examples — Google, Yahoo!, and MSN Search

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

Ans Internet stands for Interconnected network, is a network System that connect millions of web servers. The ~~(full meaning of the)~~ Internet is the online Server that connects innumerable data, servers and websites. The term 'web' reflects the meaning of the Internet in the right way. The internet has connect the world by millions of invisible online servers just the same way a spider features its web.

WWW the World Wide Web, commonly known as the Web, is an information System where documents and other web resources are identified by Uniform Resource Locators, which may be interlinked by hypertext, and are accessible over the internet.

The uses of internet in our daily life are :

(1) uses of the Internet in Education

(2) Internet use to Speed up Daily Tasks.
(3) Use of the Internet for Shopping
(4) Internet for Research and Development
(5) Business Promotion and Innovation.
(6) Communication.
(7) Money Management.
(8) Digital Transactions.
(9) Tour and Travel.

Q.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 And T, Verizon, Comcast, or Spectrum 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.

Some example of ISP in India are:

(1) Airtel X Stream Fiber
(2) Reliance Jio Fiber.
(3) Excitel Broadband
(4) ACT Broadband
(5) BSNL
(6) Hathway

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

Ans:

MAC address	IP address	Port address
(1) Layer 2 address	(1) Layer 3 address	(1) Layer 4 address.
(2) 12 digits, grouped into six pairs, 5 separated by hyphens Example: 00-00-00-00-00-00	Controls how devices on the internet communicated on a global Scale.	(2) There are 65,535 port numbers available.
(3) Can't be changed	(2) For IPv4: 32 bits, grouped into four decimal numbers e.g. 000,000,000,000. For IPv6: 128 bit, grouped into eight sets of four digits, e.g. FEDC:BA98:7654:3210: 0123:4567:89ABCDEF.	(3) (Port address) Changing anyone of these will break the TCP connection.
(4) Sometimes called Physical address	(3) can be changed at any time.	(4) Sometimes it called a socket.
(5) Hardcoded into the device at manufacturing	(4) Sometimes called logical address.	
(6) Identifies network device on a local Scale.		

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(5) Assigned to device through software configurations. (#)

(6) Context is how devices on the internet (communications) communicate on a global scale.

Q 15) How do we view my internet browser's history?

Ans (1) Open the Google Chrome internet browser.

(2) In the upper-right corner of the screen, tap the ⋮ icon.

(3) In the drop-down menu that appears, select History and shown in the image.

(4) The page that opens contains your device's history.