.Q1. Ans: The different types of networks are-

1.LAN-

- Local area network is a group of computers connected to each other in small area such as building.
- LAN is used for connecting two or more personal computers through a communication medium such as twisted pair, coaxial, cable, etc.
- It is less costly as it is built with inexpensive hardware such as hubs, network, adapters, and eternal cables.
- The data is transfer at an external faster rate in local Area Network.
- Local Area Network provides higher security.

2)PAN:

- Personal area Network is a network arranged within an individual person. Typically within a range of 10 meters.
- Personal area network is used for connecting the computer devices for personal use is known as personal area network.
- Thomas Zimmerman was the first research scientist to bring the idea of the personal network.
- Personal computer devices that are used to develop the personal area network are laptop, mobile phones, media player and play stations.

3.MAN.

- A metropolitan area network is a network that covers a larger geographic area by inter connecting a different LAN to form a larger network.
- In MAN, various LANs are connected to each other through a telephone exchange line.
- The most widely used protocols in MAN are RS-232, Frame Relay, ATM, ISDN, OC-3, ADSL, etc.
- It has a higher range than local area network (LAN).

3.WAN:

- A wide Area network is a network that extends over a large geographic area such as states or countries.
- A wide Area network is quite bigger network than then LAN.
- A wide area network is not limited to a single location, but it spans over a large geographic area through a telephone line, fibre optic cable or satellite link.
- The internet is one of the biggest WAN in the world
- A wide area network is widely used in the field of business, government, and education.

Q2.Ans: Shielding Twisted Pair (STP)

Shielding twisted pair is a special kind of cooper telephone and local area network (LAN) wiring used in some business installation. It adds an outer covering or shield than function as a ground to ordinary twisted pair wiring.

Twisted pair is the ordinary copper wire that connects many computers networks to the telephone company. To reduce cross-talk or electromagnetic induction between the pair of

wires, two insulated copper wires are twisted around each other. Each signal on twisted pair requires both wires. Unlike unshielded twisted pair, shielded twisted pair also encloses these wires in a shield and grounds them to further reduce and harder install than UTP wiring.

Shielded twisted pair come in a variety of cables categories. The most popular in use today are cat5e, cat6, cat6a and cat7. In electrically noisy business environment, shielded twisted pair use Rs-499, RJ-45, RS-232 and RJ connector to maximize the reduction of interference.

Unshielded Twisted pair(UTP):

Unshielded twisted pair cables is a 100ohm cooper cable that consists of 2 to 1800 UTP surrounded by an outer jacket. They have no metallic shield. This makes helps to improve its immunity to electrical noise and EMI.

Unshielded Twisted Pair cables are found in many Ethernet networks and telephone system. For indoor telephone applications, UTP is often grouped into sets of 25 pairs according to a standard 25-pair color code originally developed by AT&T corporation. A typical subset of these colors (white/blue, blue/white, white/orange, orange/white) shows up in most UTP cables. The cables are typically made with copper wires measured at 22 or 24 American Wire Gauge(AWG), with the color insulation typically made from an insulator such as polyethylene or FEP and the total package covered in a polyethylene jacket.

UTP is also the most common cable used in computer networking. Modern Ethernet, the most common data networking standard, can used UTP cables, with increasing data rates requiring higher specification variants of the UTP cable. CAT3, CAT4, CAT5, CAT5e, CAT6, etc. are some examples of unshielded Twisted pair cables.

Q3. Answer:

Differences between-

Baseband	Broadband
It refers to a communication channel in which information is carried in digital form.	The signals are modulated as radiofrequency analog waves that use different frequency ranges.
Communication is bi-directional which means the same channel is used to transmit and receive signals.	Communication is unidirectional meaning two different channels are needed in order to send and receive signals.
Every device on the baseband system shares the same channel.	Multiple independent channels can carry analog or digital information through FDM.
Baseband LAN are inexpensive and easier to install and maintain.	Broadband system are generally more expensive because of the additional hardware involved.
Baseband LANs have s limited distance reach is no more than a couple miles.	Broadband LANs apan much longer distance than baseband (up to tens of kilometers)

Q4. Answer:

1. A hub is a device that allows several network device to connect together to exchange data on a single network however, they have no management component. Network hubs are also known as repeaters. They are less intelligent" than switches. Unlike switches, which forward

data to the intended devices, hubs merely send the data packets to all its ports. So as the name of the repeaters suggests, it only repeats the data from an incoming port to all the other devices, this leads to frequent collision between packets.

2. Modem:
   A modem is short for a modulator-demodulator. Its function is to facilitate the transmission of data, by converting an analogue signal to code and decoding digital information.
3. Router:
   A network router directs the data packets along networks. A router has a minimum of two networks, usually LANs or WANs and its IPS. However, is able to connect to multiple nodes.

4.Switch:

A switch is a network that connects network segments on a single network. It connects many devices together on the same network, sending data to a device that needs to requests it. A switch is able to improve the performance of a network by increasing network capacity.

Switch	Router	Modem	Hub
Joins several computers together within one local area network. The join multiple networks, and are incapable of sharing an internet connection.	Joins multiple area networks(WAN), serving as middle man or intermediate destination for network traffic. Using the IP they forward data to specific destination	Modems, like routers connect home PCs to the internet.	Connects a network of personal computers together so they can be joined through a central hub.

Q5. Answer: Yes, Because, every NIC card is associated with unique MAC Address.

Q6. Answer : When troubleshooting computer network problems, the most common hardware-related problems can be-

- Hard drive malfunctioning
- PaBX
- LAN Card
- WLAN Card
- Cables
- Routers
- RAM needs to be upgraded
- VGA cable is not properly coonected
- Broken NICs
- Hardware startups.

Q7. Answer:

In a network that contains two servers and twenty workstations, the best place to install Anti-virus program is to install in the computers, systems or workstations. If we want to installed only in one system, install in the main server.

Q8. Answer: Station IP Address: It is an IP address that a computer or web server has and is identified by the rest of the internet or system and this IP address does not remain the same, instead it changes over time.

Dynamic IP address: It is an IP address that a computer or web server has and is identified by the rest of the internet or system and this IP address does not remain the same, instead it changes over time.

Difference between:

IPv4	IPv6
IPv4 has a 32-bit address length.	IPv6 has a 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 IPv6end to end, connection integrity is achievable
It can generate 4.29×10^{9} address space	Address space of IPv6 is quite large it can be produce 3.4×10^{36}address space
The security feature is dependent on application	IPSEC is an inbuilt security feature in the IPv6 protocol
Address application of IPv4 is on decimal.	Address representation of IPv6 is an hexadecimal
Fragmentation performed by sender and forwarding routers	In IPv4 fragmentation performed only by the slender
In IPv4 packet flow identification is not available	In IPv6 packet flow identification are available and uses the flow label field in the header
In IPv4checksum field is available. It has broadcast Message transmission scheme.	In IPv6 checksum field is not available. It has multicast and cast message transmission scheme is available
In IPv4 has a header of 20-60 bytes	In IPv6 has header of 40 bytes fixed

Q9. Answer: The TCP/IP model was developed prior to the OSI model. The TCP/IP model is not exactly similar to the OSI model. The TCP/IP model consists of the five layers; the application layer, transport, layer, network layer, data link and physical layer.

The first four layers provide physical standards, network interface, internetworking and transport functions that corresponds to the first four layers of the OSI model and these four layers of the OSI model and these four layers are represented in TCI/IP model by a single layer called application layer. TCI/IP is a hierarchical protocol made up of interactive modules, and each of them provides specific functionality. Each upper-layer protocol is supported by two or more lower-level protocols.

Application Layer: An application layer is the topmost layer in the TTCP/IP model. It is responsible for handling high-level protocols, issue of representation. This layer allows the user to interact with the application. When one application layer protocol wants to communicate with another application layer, it forward its data to the transport layer. There is an ambiguity occurs in the application layer. Every application can be placed inside the application layer except those who interact with the communication system.

Transport Layer: Transport layer is the second layer of the TCP/IP model. It is end-to end layer used to delivered message to a host. It is termed as end to end layer because it provides a point to point connection rather than hop to hop, between the source host and destination host to the deliver the service reliably. The unit of data encapsulation in the transport layer is a segment. The standard protocol used by transport layer to enhance its functionalities are TCP (Transmission control protocol), UDP (user datagram protocol), DCCP (datagram congestion control protocol),etc.

Network Layer: a network layer is the lowest layer of the TCP/IP model. A network layer is the combination of the physical layer and data Link layer defined in the OSI reference model. It defines how the data should be sent physical through the network. This layer is mainly responsible for the transmission of the data between two devices on the same network., the functions carried out by this layer are encapsulating the IP datagram into frames transmitted by the network and mapping IP address into the physical address. The protocols used by this layer are Ethernet, token ring, FDDI, X.25, Frame relay.

Data link layer: the data linked layer is a 4^{th} layer from the top 2^{nd} layer from the bottom. The communication system that connects the adjacent nodes is known as links and in order to move the datagram from the source to the destination, the datagram must be moved across an individual link. The main responsibility of the data link layer protocols are Ethernet, token ring, FDDI and PPP.

Physical layer: the physical layer is the first and lowest layer; The lowest layer most closely associated with the physical connection between devices. This layer may be implemented by a PHY chip. The physical layer provides an electrical connector, the frequencies of broadcast on, the line code to use and similar low-level parameters, are specific by the physical layer. The physical layer defines the means of transportation a stream of raw bits over a physical signal that is transmitted over a transmission medium.

Q10. Ans: A web browser is an application software for accessing the world wide web or a local website. When a user requests a web page from a particular website, the web browser retrieves the necessary content from a web server and then displays the page on the user's device.

A web browser is not the same thing as a search engine, though the two are often confused. A search engine is a website that provides links to other websites. However, to connect to a website's server and display its web pages, a user must have a web browser are used on a range of devices, laptops, tables and smartphones.

a) Goggle chrome b) Internet explorer c) Mozilla Firefox d) Opera e) Apple Safari f) Microsoft edge.

Q11.Answers: A search engine is a software that is accessed on the internet to assist a user to search its query on the world wide web. It is a web-based tool that enables users to locate information on the world wide web. The search engine is helpful as it carries out a systematic search on the web and displays the result that best match the user's query.

Search engine utilize automated software application that travel along the web, following links from page to page, site to site. The results are usually retrieved in the form of a list often referred to as SERPs or search Engine results Pages. This result of information may be links to web pages, or a mix of images and videos, research papers, newspaper articles, etc

Examples of search engines

- Microsoft Bing
- Wiki.com
- Yahoo
- CC search
- DuckDuckGo
- Google
- Baidu

Q12.Answer: The internet is the global system of interconnected computer networks that uses the internet protocol, suited to communicate between the networks and devices. It is a network that consists of private, scope, linked by a broad array of electronic, wireless, and optical networking technologies. The internet carries a vast range of information resources and services, such as the inter-linked hypertext documents and application for the world wide web, electronic mail, telephony and file sharing.

Q13.Answer: Internet Service Provider (ISP):

An internet service provider is an organization that provides service for accessing or participating in the internet. Internet service Provider provides can be organized in various forms, such as commercial, non-profit, or otherwise privately owned.

Internet services typically provided by ISPs can include internet access, Internet transit, remain name registration, Usenet service and colocation. An ISP typically serves as the access point that provides a user access to everything available on the internet.

Some examples of ISP in India are: BSNL, Airtel Stream Fiber, Reliance JioFiber etc.

Q14.Answer: MAC address

Media Access control refers to the piece of hardware that controls how data is pushed out onto a network. In the OSI reference model for networking, MAC is a layer 2-or data linked layer- device, and MAC address is a layer 2 address. In the current internet era, most devices are connected physically with Ethernet cables or wirelessly with Ethernet cables or wireless with Wi-Fi. Both methods use MAC address to identify a device on the network.

IP address

IP controls how on the internet communicate and defines the behavior of internet outers. It corresponds to layer 3, the network layer, of the OSI reference model. The internet was initially built around IP version and is transition to IPv6. An IP address identifies a device in the global internet, acting as the device's logical address to identified that network connection. An IPv4 address consists of 32 bits, usually written as four decimal numbers, or a dotted quad.

The IP address combines network identification and device identification data. The network refix is anywhere from eight to 31 bits and remainder identify the device on the network. Rapid growth in the number of internet-connected devices has led to the looming khaustion of the IPv4 adress list one of several reasons for the development of IPv6. An addressIPv4 consits of 12bit, with the first 64 reserved for identification and the second 64 dedicated to identifying a device on the network.

Port address

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

A port number primarily aids in the transmission of data between a network and an application. Port numbers work in collaboration with networking protocols to achieve this port numbers are mainly used in TCP and UDP based ntworks, with an available range of 65,535 for assignment port numbers. Although an application can change its portal number, some commonly used internet/network services are allocated with global port numbers such as port number 80 for HTTP, 23 for teinet and @% for SMTP.

Q15. Answer: Steps to view internet browser history:

1. Open the browser and click on the three dots and then history.
2. After clicking, the history recent pages will appear.