1.What is computer network?

->A computer network is a group of interconnected computers. It allows computers to communicate with each other and to share resources and information. The best known computer network is the internet.

2.What are the different types of computer networks?

->1)Local Area Network(LAN) 2)Metropolitan Area Network(MAN) 3)Wide Area Networks(WAN)

3. What is the difference between a LAN, WAN, and MAN?

->LAN-covers small area i.e. within building

MAN-Covers lager area than LAN and smaller than WAN

WAN-Covers large Geographical Area

4. What is the OSI model?

->The ISO was one of the first organization to formally define a common way to connect computers.

Their architecture called Open System Interconnection(OSI).

5. What are the different layers of the OSI model?

-> Physical-Data Link-Network-Transport-Session-Presentation-Application

6. What is the TCP/IP model?

->Transmission Control Protocal/Internet Protocol is a set of protocols that allow communication across multiple diverse networks

7. What are the different types of topologies?

->Star, Bus, Mesh, Ring, Hybrid

8. What is the difference between TCP and UDP?

->UDP(User Datagram Protocol):-Connectionless protocol.

Used for application that requires quick but necessarily reliable delivery.

TCP(Transmission Control Protocol):This layer is responsible for accepting and transmitting IP datagrams.

9. What are the different types of physical cables?

->1.Twisted Pair Cable-a.Shielded and b.unshielded

2.Coaxial Cable

2.Optic Fibre Cable

10. Colour code of Cables

->

11. If we want to connect same devices which cable is used

Ethernet Cable,USB cable,HDMI cable,VGA cable

12. If we want to connect different devices which cable is used

13. MAC address is how many bits long? How it is being represented

-> A MAC (Media Access Control) address is 48 bits long. It is typically represented as a series of 12 hexadecimal digits (0-9 and A-F) separated by colons, hyphens, or no delimiters at all. For example, a MAC address might be represented as:

00:1A:2B:3C:4D:5E

00-1A-2B-3C-4D-5E

001A2B3C4D5E

14. Different flow control techniques

->Simplest, Go Back N, Stop N wait , Selective Repeat

15.Different Error control techniques

->Parity Check, Checksum, Cyclic Redundancy Check(CRC),Hamming code

16. CRC and hamming code

17. What is an IP address

An IP address, or Internet Protocol address, is a numerical label assigned to each device connected to a computer network that uses the Internet Protocol for communication.

18. Versions of IP address? How are they represented

-> IPv4 (Internet Protocol version 4):

IPv4 addresses are 32-bit long numerical labels.

They are typically represented in decimal format, with four groups of numbers separated by periods (dots). Each group contains a value ranging from 0 to 255.

Example IPv4 address: 192.168.0.1

IPv6 (Internet Protocol version 6):

IPv6 addresses are 128-bit long hexadecimal labels.

They are represented as a series of eight groups of four hexadecimal digits, separated by colons.

IPv6 addresses are not case-sensitive and can use lowercase or uppercase letters.

Example IPv6 address: 2001:0db8:85a3:0000:0000:8a2e:0370:7334

19. Convert the given IP addresses to binary

192.168.2.22-----> 11000000.10101000.00000010.00010110

2402:e280:3e03:0139:843b:51fe:f3d4:e3f2-🡪

20.Range of IP address

->Class A = 0.0.0.0 – 127.255.255.255

Class B = 128.0.0.0 – 191.255.255.255

Class C = 192.0.0.0 – 223.255.255.255

Class D = 224.0.0.0 – 239.255.255.255

Class E = 240.0.0.0 - 255.255.255.255

21. What is Subnet Mask

->A subnet mask in computer networking is a 32-bit number that separates an ip address into two parts : the network address and host address. It is used to divide an ip address into network and host portions, allowing for efficient IP address allocation and routing.

22. What is Subnetting

->Subnetting is a technique used in computer networks to divide a large IP address space or network into smaller, more manageable subnetworks and subnets.

23. What is Routing

->Routing in computer networks is the process of directing data packets from their source to their destination through a complex network of interconnected routers.

24. Different types of Routing

->a.Static Routing b.Dynamic Routing c.Default Routing d.Interior Gateway Routing e.Exterior Gateway Routing

25. Several routing algorithms in dynamic routing

->RIP(Routing Information Protocol),OSPF(Open Shortest Path First),EIGRP(Enhanced Interior Gateway Routing Protocol),BGP(Border Gateway Protocol),IS-IS(Intermediate System to Intermediate System),IGRP(Interior Gateway Routing Protocol),Dijkstra’s Algorithm, Bellmon-Ford Algorithm

26. What are sockets

-> Sockets are a fundamental concept in network programming and are used to establish connections and exchange data between applications running on different computers, whether they are on the same local network or connected over the Internet.

27. What are port numbers

-> Port numbers in computer networks are 16-bit unsigned integers that help identify specific services or applications running on devices within a network. They are a key component of the Transport Layer in the OSI model and are used to facilitate communication between different applications on the same or different devices.

28. Specify the port numbers for the following applications DHCP, DNS, HTTP, HTTPS, SMTP, POP3

-> DHCP (Dynamic Host Configuration Protocol):

Port Number: UDP 67 (DHCP server) and UDP 68 (DHCP client)

DNS (Domain Name System):

Port Number: UDP 53 (DNS queries and responses)

HTTP (Hypertext Transfer Protocol):

Port Number: TCP 80 (HTTP)

HTTPS (Hypertext Transfer Protocol Secure):

Port Number: TCP 443 (HTTP over TLS/SSL)

SMTP (Simple Mail Transfer Protocol):

Port Number: TCP 25 (SMTP, used for sending emails)

POP3 (Post Office Protocol, version 3):

Port Number: TCP 110 (POP3, used for retrieving emails from a mail server)

29. What is a switch

->A switch in computer networks is a network device that operates at the Data Link Layer (Layer 2) of the OSI (Open Systems Interconnection) model. It is used to connect devices within a local area network (LAN) and facilitate the efficient and intelligent forwarding of data packets to their intended destinations.

30. What is a router

->A router in computer networks is a network device that operates at the Network Layer (Layer 3) of the OSI (Open Systems Interconnection) model. It plays a crucial role in directing data packets between different networks, such as local area networks (LANs), wide area networks (WANs), and the Internet.

31. What is a firewall

-> A firewall in computer networks is a network security device or software that acts as a barrier or filter between a trusted internal network and an untrusted external network, such as the Internet. The primary purpose of a firewall is to control and monitor incoming and outgoing network traffic, allowing or blocking data packets based on a set of predefined security rules.

32. What is DHCP, explain the process of DHCP

-> DHCP stands for Dynamic Host Configuration Protocol. It is a network protocol used in computer networks to automatically assign and manage IP addresses and other network configuration parameters to devices, such as computers, smartphones, and printers. DHCP simplifies network administration by dynamically allocating IP addresses, making it easier to add, remove, and manage devices on a network without manual configuration.

33. What is DNS

-> DNS, or Domain Name System, is a fundamental and distributed naming system used in computer networks and the Internet to translate human-friendly domain names (e.g., www.example.com) into numeric IP addresses (e.g., 192.0.2.1) that computers and network devices use to identify each other on the network.