Important Short Questions of Computer Networks

Q1. Define Protocol with example?

Ans: A network protocol is a set of established rules that dictate how to format, transmit and receive data so that computer network devices can communicate.

Example: HTTP is the protocol used by web browsers for communicating with web servers.

Q2. Why are protocols needed?

Ans: Protocols are needed because they are used to describe how devices can communicate. Protocols also defines format of data.

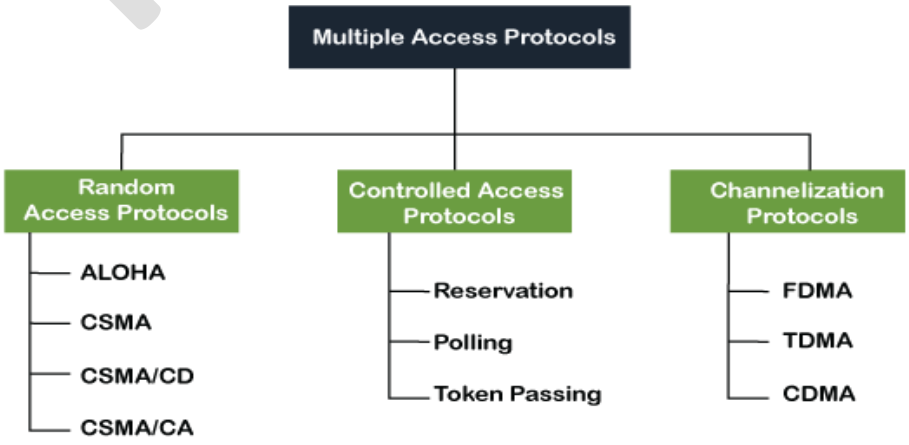
Q3. Name any four application layer protocols?

Ans:

- Domain Name System (DNS)
- Simple Mail Transfer Protocol (SMTP)
- File Transfer Protocol (FTP)
- Hyper Text Transfer Protocol (HTTP)

Q4. List the names of multi access protocols?

Ans:



Q5. Define Token ring protocol?

Ans: Token ring (IEEE 802.5) is a communication protocol in a local area network (LAN) where all stations are connected in a ring topology. A token is a special frame of 3 bytes that circulates along the ring of stations. A station can send data frames only if it holds a token. This protocol resides at data link layer.

Q6. Define channel capacity?

Ans: The channel capacity C is defined as the largest rate at which information can be transmitted with the smallest possible error through a transmission medium.

Q7. Define subnet mask?

Ans: A subnet mask is a 32-bit number created by setting host bits to all 0s and setting network bits to all 1s. In this way, the subnet mask separates the IP address into the network and host addresses.

Example:

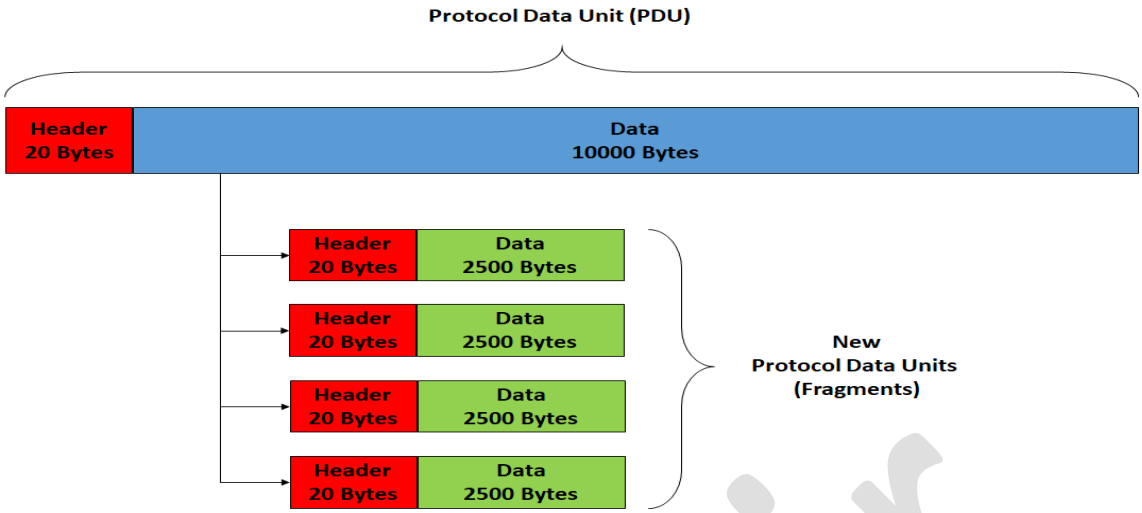
- 192.168.1.1 (IP Address)
- 255.255.255.0 (Subnet Mask)

Q8. What is Congestion? Congestion control is implemented on which layer and how?

Ans: Congestion is a situation in which too many packets are present in a part of the subnet, this often leads to the queuing of packets, loss of packets as well as a decrease in the network's Quality of Service (QoS). Congestion control is implemented at Transport layer. It is implemented using different congestion control algorithms like Leaky Bucket and Token Bucket.

Q9. What is fragmentation?

Ans: Fragmentation is an important function of network layer. It is technique in which gateways break up or divide larger packets into smaller ones called fragments. Each fragment is then sent as a separate internal packet. Each fragment has its separate header.



Q10. If a host on a network is assigned a subnet address of 172.16.112.2/25, what would be the valid subnet address of this host?

Ans: For obtaining subnet address perform AND operation on subnet mask and given IP address.

IP address = 172.16.112.2/25

Subnet mask = 225.255.255.128

Subnet address = 172.16.112.0/25

Q11. What is the broad cast address of 172.16.96.0/19 network?

Ans: A bitwise OR between the network address and the "inverted" subnet mask would give us the broad cast address.

IP address = 172.16.96.0/19

Subnet mask = 225.225.224.0

Inverted subnet mask = 0.0.31.255

Broadcast address = 172.16.127.255

Q12. What is meant by reliability and accuracy at transport layer?

Ans: Transport layer use Transmission Control Protocol (TCP) which is a reliable protocol because it notifies the sender whether or not the delivery of data to intended recipients was successful. The transport layer ensure accuracy by performing error control on the receiving end by ensuring that the data received is complete.

Q13. What is encryption? Give Example. Which layer is responsible for encryption?

Ans: Encryption is the process of transforming data into an unintelligible form to prevent the unauthorized use of the data. To read an encrypted file, you must have access to a secret decryption key or password. A simple example is representing alphabets with numbers – say, 'A' is '01', 'B' is '02'. Presentation layer of OSI model is responsible of Data Encryption.

Q14. How does attenuation differ from distortion?

Ans:

Attenuation	**Distortion**
Any loss in the strength of the signal because of resistance of the medium is called as attenuation.	Distortion is any alteration of the original signal induced by the attenuation, noise or any other type of interference.
Attenuation does not change the waveform of the signal	Distortion does change the waveform of the signal
Overcoming from the effects of the attenuation is easy.	Distortion effects are harder to remove.

Q15. Difference between packet switching and circuit switching?

Ans:

Circuit Switching Vs Packet Switching

Circuit Switching	Packet Switching
Physical path between source and destination	No physical path
All packets use same path	Packets travel independently
Reserve the entire bandwidth in advance	Does not reserve
Bandwidth Wastage	No Bandwidth wastage
No store and forward transmission	Supports store and forward transmission

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Q16. Why twisted pair cable is twisted?

Ans: A twisted-pair cable is a cable consisting of one or several pairs of copper wires. Twisting helps minimize electromagnetic interference and resist external interference. By twisting the wires, some part of the noise signals goes in one direction (sending) while the other part goes in the opposite direction (receiving).

Q17. Which two layers offer reliability?

Ans: Session layer and transport layer are the responsible for reliability. Session layer creates and maintains a reliable connection and transport layer offers reliable end-to end delivery of packets using TCP.

Q18. What is the goal of multiplexing?

Ans: Multiplexing is the process in which multiple signals coming from multiple sources are combined and transmitted over a single medium. The goal of multiplexing is to decrease the transmission cost by sending more than one

signal on a single medium and to utilized the bandwidth of a medium effectively.

Q19. Define Infrared signals? Give an example.

Ans: Infrared wave is electromagnetic radiation (EMR) with wavelengths longer than those of visible light. A signal that is transmitted using infrared radiations is called Infrared signal. The remote controls that are used to control the operation of certain gadgets such as televisions, stereos, toy cars, are the examples of infrared signals.

Q20. Difference between layer 2 switch and bridge?

Ans:

Switch	**Bridge**
Switch divide large LAN into many smaller segments	Bridge divide LAN into couple of smaller segments.
A switch can have a lot of ports	A bridge can have 2 or 4 ports only
The switch performs the packet forwarding by using hardware	The bridge performs the packet forwarding by using software
The task of error checking is performed by a switch.	A bridge cannot perform the error checking.

Q21. What is RIP?

Ans: Routing Information Protocol (RIP) is a dynamic routing protocol that uses hop count as a routing metric to find the best path between the source and the destination network. It works on the Network layer of the OSI model.

Q22. What is cell sectoring?

Ans: Cell sectoring is a method of decreasing the co-channel interference and enhancing system performance by replacing the omni-directional antenna at the base station with a number of directional antennas. In cell sectoring each cell is sub-divided into radial sectors with directional BS antennas.

Q23. Define IEEE 802.11 standard?

Ans: IEEE 802.11 standard, popularly known as wifi, is a set of local area network (LAN) technical standards that specifies the set of media access control (MAC) and physical layer (PHY) protocols for implementing wireless local area network.

Q24. What is signaling rate?

The average rate at which the data passes through a particular point along the transmission channel within the system.

Q25. What is the goal of physical addressing?

Ans: A Physical address also known as (MAC address) is a hardware identifier that uniquely identifies each device on a network. The goal of MAC addressing is to identify the devices within the same broadcast network.

Q26. What is meant by bridges?

Ans: A network bridge, also known as a layer 2 switch, is a hardware device used to create a connection between two separate computer networks or to divide one network into two.

Q27. Define Ethernet?

Ans: Ethernet is primarily a standard communication protocol used to create local area networks. It transmits and receives data through cables. Ethernet use devices like routers, switches and hubs to direct traffic.

Q28. Give the working principle of switch?

Ans: Working principle of switch is packet switching. In packet switching the entire message is broken down into smaller chunks called packets. The switching information is added in the header of each packet and transmitted independently.

Q29. Why we use serial transmission?

Ans: Because it has a full-duplex transmission mode. In serial transmission, the sender can receive and send the data simultaneously. Serial Transmission is cost-efficient and the circuit used in Serial Transmission is simple.

Q30. How we calculate a bit rate for noisy and noiseless channel?

Ans:

- **Noiseless Channel:**
  For noiseless channel the Nyquist bit rate formula is used to calculate bit rate
  - BitRate = 2 * Bandwidth * $\log_2(L)$
  - (L is the number of signal levels)
- **Noisy channel:**
  For noisy channel the Shannon Capacity formula is used to calculate bit rate
  - Capacity = bandwidth * $\log_2(1 + SNR)$
  - (SNR is the signal-to-noise ratio)

Q31. Define digital to analog conversion? What are the different types of digital to analog conversion?

Ans: Digital to analog conversion is a process by which digital signals (which have a binary state) are converted to analog signals (which theoretically have an infinite number of states). There are three kinds of digital-to-analog conversions:

- Amplitude Shift Keying
- Frequency Shift Keying
- Phase Shift Keying

Q32. What are the differences between amplitude shift keying and frequency shift keying?

Ans:

Amplitude shift keying	**Frequency shift keying**
In this conversion technique, the amplitude of analog carrier signal is modified to reflect binary data.	In this conversion technique, the frequency of the analog carrier signal is modified to reflect binary data.

Both frequency and phase remain same.	Both Amplitude and phase remain same.

Q33. What is the difference between half-duplex and full-duplex transmission modes?

Ans:

Half Duplex	**Full Duplex**
In half duplex mode communication is two-directional but, one at a time.	In full duplex mode communication is two directional and done simultaneously.
A sender can send as well as receive the data but one at a time.	A sender can send as well as receive the data simultaneously.
Example: Walkie-Talkies.	Example: Telephone.

Q34. If there is a single path between the source host and destination host, do we need a router between the two hosts?

Ans: A primary function of a router is to determine the best path to use to send packets. If there is a single path between the source host and destination host than we don't need router.

Q35. Distinguish between baseband transmission and broadband transmission?

Ans:

Baseband transmission	**Broadband transmission**
Transmit digital signals	Transmit analog signals
To boost signal strength, use repeaters	To boost signal strength, use amplifiers

Can transmit only a single data stream at a time	Can transmit multiple signal waves at a time
Support bidirectional communication simultaneously	Support unidirectional communication only
Mainly used in Ethernet LAN networks	Mainly used in cable and telephone networks

Q36. What are the applications of multiplexing?

Ans: The applications of multiplexing include the following.

- Analog Broadcasting
- Digital Broadcasting
- Telephony
- Video Processing
- Telegraphy

Q37. What are two types of line configuration?

Ans: Line configuration refers to the way two or more communication devices attached to a link. The two types of line configuration are following:

- Point to Point connection
- Multipoint connection

Q38. What function does a modem perform?

A modem transforms digital information from your computer into analog signals that can transmit over wires, and it can translate incoming analog signals back into digital data that your computer can understand.

Q39. What is meant by high speed Ethernet?

Ans: Fast Ethernet is one of the versions of the Ethernet standard that enables the transmission of data over 100 megabits per second on local area networks (LAN). It was launched in 1995 and was the fastest network connection of its time.

Q40. What is flow control? Where it is implemented in OSI model?

Ans: Flow control is the process of managing the rate of data transmission between two nodes. Flow control tells the sender how much data should be sent to the receiver so that it is not lost. Flow control is generally implemented on two layers Datalink Layer (Layer 2) and Transport Layer (Layer 4).

Q41. What is reflection?

Ans: The return of light or sound waves from a surface is called reflection. When a ray of light approaches a smooth polished surface and the light ray bounces back, it is called the reflection of light.

Q42. What is the difference between third and fourth generation cellular wireless networks?

Ans:

The maximum upload rate of 3G technology is 5 Mbps.	While the maximum upload rate of 4G technology is 500 Mbps.
The maximum download rate of 3G technology is 21 Mbps.	While the maximum download rate of 4G technology is 1 Gbps.
It uses a packet switching technique.	While it uses the packet switching technique as well as the message switching technique.
The frequency range of 3G technology is from 1.8 GHz to 2.5 GHz.	While its frequency range is from 2 GHz to 8 GHz.

Q43. In which layer, IP address is used?

Ans: An IP address is a unique address that identifies a device on the internet or a local network. IP stands for "Internet Protocol,". IP address is used in Layer3 (Internet layer) of the TCP/IP model and Layer 3 (Network layer) of the OSI model.

Q44. What are the components of data communication system?

Ans: There are mainly five components of a data communication system:

1. Message
2. Sender
3. Receiver
4. Transmission Medium
5. Set of rules (Protocol)

Q45. What is compression? Which layer is responsible for compression?

Ans: Data compression is a reduction in the number of bits needed to represent data. Compressing data can save storage capacity, speed up file transfer, and decrease costs for storage hardware and network bandwidth. Application layer of the TCP/IP model and presentation layer of OSI modal is responsible for compression.

Q46. What types of addresses are used in Network, Data Link, Transport and application layer?

Ans:

- Network layer — uses IP address also known as logical address
- data link layer— uses mac address also known as physical address
- Transport layer — use port addresses
- Application layer — use Specific addresses

Q47. List two cellular network protocols?

- Global System for Mobile communication (GSM).
- General Packet Radio Service (GPRS).
- Enhanced Data Rates for GSM Evolution (EDGE).
- Universal Mobile Telecommunications Service (UMTS).

Q48. What is handoff?

Ans: In cellular telecommunications, the terms handover or handoff refers to the process of transferring ongoing call or data connectivity from one Base Station to other Base Station.

Q49. What is the difference between switch and router?

Ans:

Sr.No.	Router	Switch
1.	The main objective of router is to connect various networks simultaneously.	While the main objective of switch is to connect various devices simultaneously.
2.	It works in network layer.	While it works in data link layer.
3.	Router is used by LAN as well as MAN.	While switch is used by only LAN.
4.	Through router data is sent in the form of packet.	While through switch data is sent in the form of packet and frame.

Q50. How does single bit error differ from burst error?

Ans: In single bit error only one bit of data unit is changed from 1 to 0 or from 0 to 1. In burst error two or more bits in data unit are changed from 1 to 0 from 0 to 1.

Q51. Define two main categories of network?

Ans: Networks are divided into two types, a LAN (Local Area Network) or a WAN (Wide Area Network). A LAN is a network that is limited to an area such as a building or school. A Wide Area Network (WAN) is not confined to one building. The computers and terminals forming part of the network can be spread around the world.

Q52. Which connectors are used in fiber optic cable?

Ans: Fiber cables transmit pulses of light instead of electrical signals, so the terminations must be much more precise. The most commonly used connectors today are:

- Square connector (SC)
- Lucent Connector (LC)

- Ferrule Connector (FC)
- Straight Tip (ST)

Q53. Define a Network?

Ans: A network is a group of two or more computers or other electronic devices that are interconnected for the purpose of exchanging data and sharing resources.

Q54. What is refraction?

Ans: Refraction is the change in the direction of a wave passing from one medium to another. For example, when light travels from air into water, it slows down, causing it to continue to travel at a different angle or direction.

Q55. Define throughput and bandwidth

Ans:

- **Bandwidth:**
  Bandwidth refers to the data capacity of a channel. It is defined as the total amount of data which can be transferred over a network in a specific period of time.
- **Throughput:**
  Throughput refers to the exact measurement of data transferred in a specific time period. Also called as effective data rate or payload rate.

Q56. Define Scrambling?

Ans: Scrambling is a digital encoding technique that is used at the receiving end to ensure synchronization between sender and receiver data rate without increasing the number of bits.

Q57. Differentiate between TCP and UDP?

Ans:

TCP	UDP
TCP stands for Transmission Control Protocol	UDP Stands for User Datagram Protocol
Transmission Control Protocol is a connection-oriented protocol.	User Datagram Protocol is a connectionless protocol.
TCP is a reliable protocol as it provides assurance for the delivery of data packets.	UDP is an unreliable protocol as it does not take the guarantee for the delivery of packets.
TCP has a (20-60) bytes variable length header.	UDP has an 8 bytes fixed-length header.
TCP is used by HTTP, HTTPs, FTP, SMTP and Telnet.	UDP is used by DNS, DHCP, TFTP, SNMP, RIP, and VoIP.

Q58. Give an example of packet switching?

Ans: The Internet is the prime example of a packet-switched network based on the TCP/IP protocol suite. A series of routers located at various points on the Internet's backbone forward each packet received on the basis of destination address until the packet reaches its ultimate destination.

Q59. Differentiate between noise and distortion?

Ans:

1. Distortion is a change of the original signal, whereas noise is an external random signal added to the original signal.
2. Removing the effects of noise is harder than removing the effects of distortion.

Q60. Define ALOHA and Slotted ALOHA techniques?

Ans: ALOHA is a medium access control (MAC) protocol for transmission of data via a shared network channel. Using this protocol, several data streams originating from multiple nodes are transferred through a multi-point transmission channel.

Slotted ALOHA is an improvement over pure ALOHA. Here, time is divided into discrete intervals called slots, corresponding to a frame.

Q61. Why broadcast link is not favorable in communication?

Ans: The broadcast network has single communications channel so.

- It cannot accommodate huge number of devices.
- It doesn't allow personalization of message.

Q62. What is client server model in Networks? Give any example.

Ans: The client-server model is a distributed application framework dividing tasks between servers and clients. In client-server architecture many clients request and receive service from a centralized server (host computer). Examples of Client-Server Model are Email, World Wide Web, etc.

Q63. How many types of address are used in networks?

Ans: Types of Addressing in Network:

- Physical Address
- Logical Address
- Port Address
- Specific Address

Q64. What is difference between switch and Access Point?

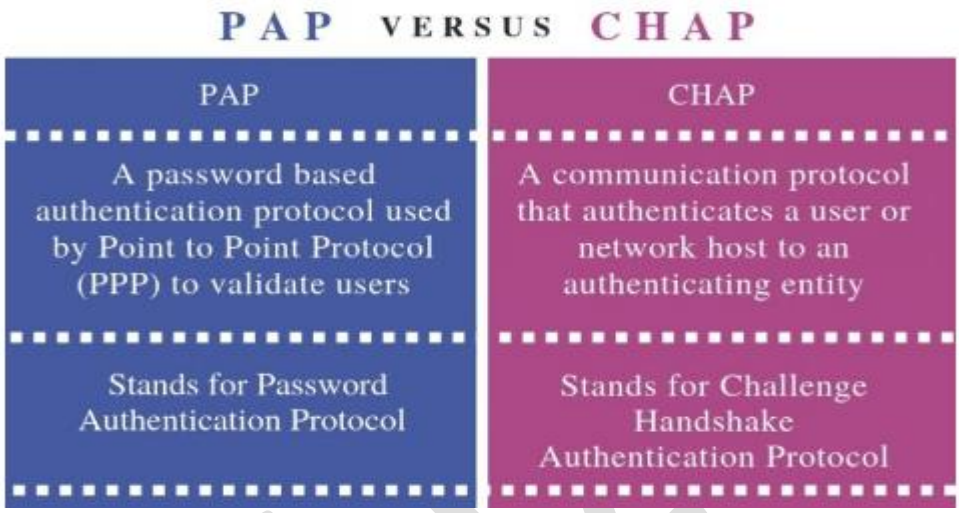
Ans: A switch connects various Ethernet devices via individual cables. Switch has many ports may be around 50.

An access point connects various Wi-Fi devices to the wired network. An access point can have up to 7 to 8 ports.

Q65. What is HDLC?

Ans: A high-level data link control (HDLC) is a bit-oriented synchronous data link layer protocol. HDLC ensures the error-free transmission of data to the proper destinations and controls the data transmission speed.

Q66. What is PAP & CHAP?



Q67. Which protocol use echo packet to check connectivity?

Ans: The Internet Control Message Protocol (ICMP), a network layer protocol, use echo packets to check connectivity. The ping command is used to verify connectivity with another host on a network.

Q68. How www.google.com request is entertained by the google DNS server?

Ans: DNS stands for Domain Name System. the DNS translates a web address like "www.google.com" into the physical IP address—such as"74.125.19.147"—of the computer hosting that site (in this case, the Google homepage).

Q69. What is process to process communication? Which layer is responsible for it?

Ans: Process to process communication, means the transfer of data that takes place between individual processes executing on end systems. This is done

using port numbers or port addresses. Transport layer is responsible for process to process communication.

Q70. What is Intra Domain routing?

Ans: An intra domain routing protocol is a procedure for routing packets within a defined domain, such as for routing e-mail or Web browsing within an institutional network.

Q71. What is infinity problem to count?

Ans: One of the important issue in Distance Vector Routing is Count of Infinity Problem. Counting to infinity is just another name for a routing loop. Routing loop means a data packet is continually routed through the same routers over and over. The routing loops occur when the network links break between the devices.

Q72. Difference between IPS/IDS, Firewall and VPN

Ans: Firewall is a network security device that filters incoming and outgoing network traffic based on predetermined rules

Intrusion Prevention System (IPS) is a device that inspects traffic, detects it, classifies and then proactively stops malicious traffic from attack.

Virtual private network (VPN) protects your online identity by hiding your IP address, and allows you to use public Wi-Fi hotspots safely.

Q73.What is AAAA record?

Ans: An AAAA Record (quad A Record) is another type of DNS Record that points a domain or subdomain to an IPv6 address. An AAAA record is used to find the IP address of a computer connected to the internet from a Domain name.

Q74. What do you mean by CSMA/CD and CSMA/CA?

Ans: CSMA/CD and CSMA/CA are the media access methods that govern how a device can transmit data to the network. CSMA/CD stands for Carrier Sense Multiple Access / Collision Detection. CSMA/CA stands for Carrier Sense

Multiple Access/Collision Avoidance. Both methods are used in a single collision domain.

Q75. What is connection oriented protocol also list the name of that protocol?

Ans: Connection Oriented protocol is one that requires a logical connection to be established between the two processes before data is exchanged. TCP is an example of a connection-oriented protocol.

Q76. What is time domain analysis for signal?

Ans: Time domain refers to variation of amplitude of signal with time. Time domain analysis examines the amplitude vs. time characteristics of a measuring signal. Time domain analysis gives the behavior of the signal over time.

Q77. What is error detection?

Ans: In networking, error detection refers to the techniques used to detect noise or other impairments introduced into data while it is transmitted from source to destination. Error detection ensures reliable delivery of data across vulnerable networks.

Q78. Differentiate between ARP and RARP and which is layer is responsible for these?

BASIS FOR COMPARISON	ARP	RARP
Full Form	Address Resolution Protocol.	Reverse Address Resolution Protocol.
Basic	Retrieves the physical address of the receiver.	Retrieves the logical address for a computer from the server.
Mapping	ARP maps 32-bit logical (IP) address to 48-bit physical address.	RARP maps 48-bit physical address to 32-bit logical (IP) address.

ARP and RARP both are network layer protocols.

Q79. Explain block coding with suitable example?

Ans: Block coding refers to the technique of adding extra bits to a digital word in order to improve the reliability of transmission. In block coding, we divide our message into blocks, each of k bits, called data words. We add r redundant bits to each block to make the length n = k + r. The resulting n-bit blocks are called code words.

Q80. Indicate some significant differences between broadcast radio and microwave?

Ans: The frequency of radio waves can take values from 300 GHz to 3 kHz, but microwaves are defined to have frequencies ranging from 300 GHz to only 300MHz.

Radio waves in general have long distance communication capabilities, but microwaves do not have these abilities.

Q81. What is a parity bit?

Ans: A parity bit is a check bit, which is added to a block of data for error detection purposes. It is set to either 1 or 0 to make the total number of 1-bits either even ("even parity") or odd ("odd parity").

Q82. What is attenuation?

Ans: Any loss in the strength of the signal because of resistance of the medium is called as attenuation. Attenuation does not change the waveform of the signal.

Q83. Explain the term data network?

Ans: A data network is a system designed to transfer data from one network access point to one other or more network access points via data switching, transmission lines, and system controls.

Q84. Explain Asynchronous communication?

Ans: Asynchronous communication means communication which happens 'out of sync' or in other words; not in real-time. Asynchronous communication is

when two (or more) people can communicate without the requirement that they be “present” at the same exact moment in time.

Q85. What is CDMA?

Ans: CDMA (Code-Division Multiple Access) refers to any of several protocols used in second-generation (2G) and third-generation (3G) wireless communications. CDMA is a form of multiplexing, which allows numerous signals to occupy a single transmission channel, optimizing the use of available bandwidth.

Q86. What is cyclic redundancy check?

Ans: The cyclic redundancy check (CRC) is an error detection technique in digital data. In the cyclic redundancy check, a fixed number of check bits, often called a checksum, are appended to the message that needs to be transmitted. The data receivers receive the data, and inspect the check bits for any errors.

Q87. What is DSL list down its various types?

Ans: DSL (Digital Subscriber Line) is a modem technology that uses existing telephone lines to transport high-bandwidth data, such as multimedia and video. DSL provides dedicated, point-to-point, public network access. There are various types:

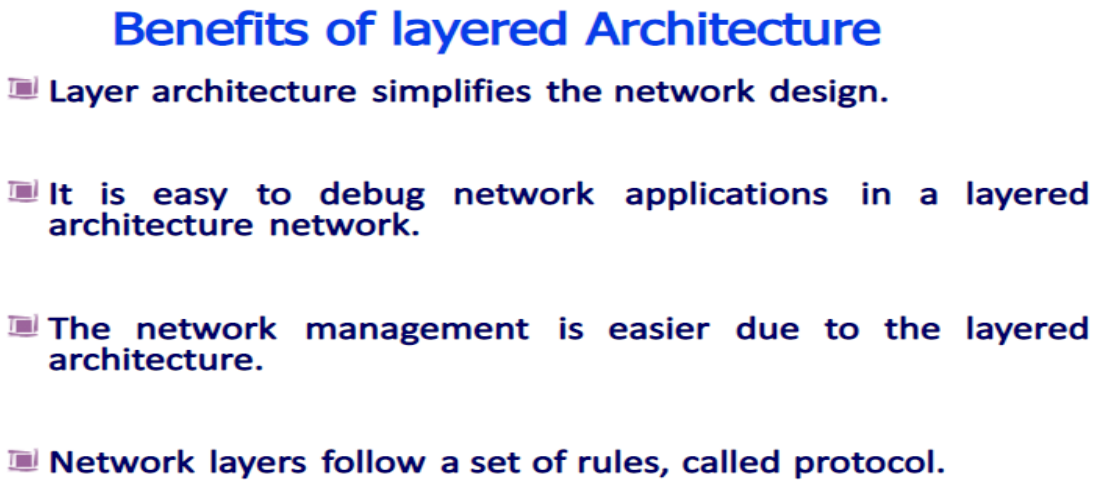
- Asymmetric DSL (ADSL)
- high-bit-rate DSL (HDSL)
- symmetric DSL (SDSL)
- very-high-bit-rate DSL (VDSL).

Q88. Define VLAN?

Ans: A virtual LAN (VLAN) is a logical overlay network that groups together a subset of devices that share a physical LAN, isolating the traffic for each group.

Q89.What are the advantages of using layered architecture?

Ans:



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