COMPUTER NETWORKING

SHORT TYPE QUES. & ANS.

Q. Define Network?

A network is a set of devices connected by physical media links. A network is recursively is a connection of two or more nodes by a physical link or two or more networks connected by one or more nodes.

Q. What is a link?

At the lowest level, a network can consist of two or more computers directly connected by some physical medium such as **coaxial cable or optical fiber.** Such a physical medium is called as link.

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Q. What is a node?

A network can consist of two or more computers directly connected by some physical medium such as coaxial cable or optical fibre. Such a physical medium is called as Links and the computer it connects is called as nodes.

Q. What is a gateway or Router?

A node that is connected two or more networks is commonly called as Router or Gateway. It generally fowards message from one network to another.

? What is point-point link?

✓ If the physical links are limited to a pair of nodes it is said to be point-Point link.

? What is Multiple Access?

✓ If the physical links are shared by more than two nodes, it is said to be multiple Access.

? What are the advantages of Distributed Processing?

✓

a.	Security/Encapsulation
b.	Distributed database
c.	Faster Problem solving
d.	Security through redundancy
e.	collaborative processing

? What are the criteria necessary for an effective and efficient network?

✓ a). Performance :-
It can be measured in many ways, including transmit time and response time.

b). Reliability :-
It is measured by frequency of failure, the time it takes a link to recover from a failure, and the network's robustness.

c). Security :-
Security issues includes protecting data from unauthorized access and virus.

* Name the factors that affect the performance of the network?

a. Numbers of users
b. Type of transmission medium
c. Hardware
d. Software

* Name the factors that affect the reliability of the network?

a. Frequency of failure
b. Recovery time of a network after a failure.

* Name the factors that affect the security of the network?

a. Unauthorized Access
b. Viruses

* What is Protocol?

A protocol is a set of rules that govern all aspects of information communication.

* What are the key elements of Protocols?

The key elements of protocols are :-

a) Syntax :- It refers to the structure or format of the data, that is the order in which they are presented.

b) Semantics :- It refers to the meaning of each section of bits.

c) Timing :- Timing refers to two characteristics : When data should be sent and how fast they can be sent.

* **What are the key design issues of a computer Network?**

a.	Connectivity
b.	cost-effective Resource sharing
c.	Support for common services
d.	Performance

* **Define BandWidth and Latency?**

Network performance is measured in BandWidth (throughput) and Latency (Delay).

BandWidth:- BandWidth of a network is given by the number of bits that can be transmitted over the network in a certain period of time.

Latency:- Latency corresponds to how long it takes a message to travel from one end off a network to the other. It is strictly measured in the terms of time.

* **Define Routing?**

The process of determining systamatically hoe to forward messages toward the destination nodes based on its address is called routing.

* **What is a peer-peer process?**

The process on each machine that communicate at a given layer are called peer-peer process.

* **What is a Round TripTime?**

The duration of time it takes to send a message from one end of a network to the other and back, is called RTT.

When a switch is said to be congested?

It is possible that a switch recieves packets faster than the shared link can accommodate and stores in its memory, for an extended period of time, then the switch will eventually run out of buffer space, and some packets will have to be dropped and in this state is said to congested state.

What is semantic gap?

Defining a useful channel involves both understanding the applications requirements and recognizing the limitations of the underlying technology. The gap between what applications expects and what the underlying technology can provide is called semantic gap.

Define the terms Unicasting, Multicasting and Broadcasting?

Unicasting:- If the message is sent from a source to a single destination node, it is called Unicasting.

Multicasting:- If the message is sent to some subset of other nodes, it is called Multicasting.

Broadcasting:- If the message is sent to all the N nodes in the network. It is called Broadcasting.

What is Multiplexing?

Multiplexing is the set of techniques that allows the simultaneous transmission of multiple signals accross a single data link.

Name the categories of multiplexing?

a. Frequency Division Multiplexing (FDM).
b. Time Division Multiplexing (TDM).
   i. Synchronous TDM.
   ii. Asynchronous TDM Or Statistical TDM.
c. Wave Division Multiplexing (WDM).

What is FDM?

FDM is an analog technique that can be applied when the bandwidth of a link is greater than the combined bandwidths of the signals to be transmitted.

What is WDM?

WDM is conceptually the same as FDM, except that the multiplexing and demultiplexing involve light signals transmitted through fiber optics channel.

What is TDM?

TDM is a digital process that can be applied when the data rate capacity of the transmission medium is greater than the data rate required by the sending and receiving devices.

What is Synchronous TDM?

In STDM, the multiplexer allocates exactly the same time slot to each device at all times, whether or not a device has anything to transmit.

List the layer of OSI?

a. Physical layer
b. Data link layer
c. Network layer.
d. Transport layer.
e. Session layer
f. Presentation layer
g. Application layer.

Which layer are network support layers?

a. Physical layer
b. Data link layer
c. Network layer.

Which layers are user support layer?

a. Session layer
b. Presentation layer
c. Application layer.

Which layer links the network support layers and user support layers?

The transport layer links the network support layers and user support.

What are the responsibilities of Network layer?

The Network Layer is responsible for the source-to-destination delivery of the packet possibly accross multiple network (links).

a. Logical addressing.
b. Routing.

? What are the concerns of the Physical layer?

✓ Physical layer coordinates the functions required to transmit a bit stream over a physical medium.

a. Physical characteristics of interfaces and media.
b. Representation of bits.
c. Data rate.
d. Synchronization of bits.
e. Line configuration.
f. Physical topology.
g. Transmission mode.

? What are the responsibilities of Data link layer?

✓ The data link layer transforms the physical layer, a raw transmission facility, to a reliable link and is responsible for node-node delivery.

a. Framing
b. Physical Addressing
c. Flow control
d. Error control
e. Access control

? What are the responsibilities of Transport layer?

✓ The Transport layer is responsible for the source-to-destination delivery of the entire message.

a. Service-Point Addressing
b. Segmentation and reassembly
c. control (connection).
d. Flow control.
e. Error control.

? What are the responsibilities of session layer?

✓ The session layer is the network dialog controller. It establishes, maintains and synchronizes the interaction between the communicating systems.

a. Dialog control.
b. Synchronizes.

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? What are the responsibilities of Presentation layer?

✓ The presentation layer is concerned with the syntax and semantics of the information exchanged between two systems.

a. Translation
b. Encryption
c. Compression

? What are the responsibilities of Application layer?

✓ The Application Layer is enables the user, whether human or software, to access the network. It provides user interfaces and support for services such as e-mail, shared database management and other types of distributed information services.

a. Network virtual Terminal.
b. File Transfer, access and Management (FTAM).
c. Mail services.
d. Directory services.

? What are the different link types used to build a computer network?

✓

a. Cables
b. Leased lines
c. Last-mile links
d. Wireless Links.

? What are the two classes of hardware building blocks?

✓ Nodes and Links.

? What are the categories of Transmission media?

✓
a. Guided Media
   i. Twisted - Pair cable
   ii. Coaxial Cable
   iii. Fiber - Optic cable

b. Unguided Media.
   i. Terrestrial microwave
   ii. satellite communication.

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? What are the types of errors?

✓ a. Single - Bit error :- In a single - bit error, only one bit in the data unit has changed.

b. Burst Error :- A Burst error means that two or more bits in the data have changed.

? What is error Detection? What are its methods?

✓ Data can be corrupted during transmission. For reliable communication errors must be deducted and corrected. Error Detection uses the concept of redundancy, which means adding extra bits of detecting error at the destination. The common Error Detection methods are:-

a. Vertical Redundancy check (VRC)
b. Longitudinal Redundancy check (LRC)
c. Cyclic Redundancy check (CRC)
d. Checksum.

What is Redundancy?

The concept of including extra information in the transmission solely for the purpose of comparison. This technique is called redundancy.

What is VRC?

It is the most common and least expensive mechanism for error Detection. In VRC, a parity bit is added to every data unit so that the total number of 1s becomes even for even parity. It can detect all single-bit errors. It can detect burst errors only if the total number of errors in each data unit is odd.

What is LRC?

It is the block of bits is divided into rows and a redundant row of bits is added to the whole block. It can detect burst errors. If two bits in one data unit are damaged and bits in exactly the same positions in another data unit are also damaged, the LRC checker will not detect an error. In LRC a redundancy data unit follows n data unit.

What is CRC?

CRC, is the most powerful of the redundancy checking techniques, is based on binary division.

What is Checksum?

Checksum is used by the higher layer protocols (TCP/IP) for error detection.

? List the steps involved in creating the checksum.

✓
a. Divide the data into sections.
b. Add the sections together using 1's complement arithmetic.
c. Take the complement of the final sum, this is the checksum.

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? What are the data link protocols?

✓ Data link protocols are set of specifications used to implement the data link layer. The categories of Data Link protocols are 1. Asynchronous protocols.
2. Synchronous protocols.
   - a. Character Oriented protocols.
   - b. Bit Oriented protocols.

? Compare Error Detection and Error Correction:

✓ Error Detection :- It is a method that can look at some data detect if it has been corrupted while it was stored or transmitted.

Error correction :- It is a step better than error detection; when it detects an error it tries to put the data back to how it should have been.