Computer Network

1. 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.

2. 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.

3. 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 fiber. Such a physical medium is called as Links and the computer it connects is called as Nodes.

4. What is a gateway or Router?

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

5. What is point-point link?

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

6. What is Multiple Access?

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

7. What are the advantages of Distributed Processing?

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

8. 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.

9. Name the factors that affect the performance of the network?

a. Number of Users
b. Type of transmission medium
c. Hardware
d. Software

10. Name the factors that affect the reliability of the network?

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

11. Name the factors that affect the security of the network?

a. Unauthorized Access
b. Viruses

12. What is Protocol?

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

13. 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.

14. What are the key design issues of a computer Network?

a. Connectivity
b. Cost-effective Resource Sharing
c. Support for common Services
d. Performance

15. Define Bandwidth and Latency?

Network performance is measured in Bandwidth (throughput) and Latency (Delay). 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 corresponds to how long it t5akes a message to travel from one end off a network to the other. It is strictly measured in terms of time.

16. Define Routing?

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

17. What is a peer-peer process?

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

18. When a switch is said to be congested?

It is possible that a switch receives 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.

19. 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.

20. What is Round Trip Time?

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

21. Define the terms Unicasting, Multicasting and Broadcasting?

If the message is sent from a source to a single destination node, it is called Unicasting.
If the message is sent to some subset of other nodes, it is called Multicasting.
If the message is sent to all the m nodes in the network it is called Broadcasting.

22. What is Multiplexing?

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

23. 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)

24. 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.

25. What is WDM?

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