CS2302 COMPUTER NETWORKS (QUESTION & ANSWER BANK)

UNIT – I

1. What is mean by data communication?

Data communication is the exchange of data (in the form of 1s and 0s) between two devices via some form of transmission medium (such as a wire cable).

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

The most important criteria are performance, reliability and security. Performance of the network depends on number of users, type of transmission medium, the capabilities of the connected h/w and the efficiency of the s/w.

Reliability is measured by frequency of failure, the time it takes a link to recover from the failure and the network's robustness in a catastrophe.

Security issues include protecting data from unauthorized access and viruses.

3. What are the three fundamental characteristics determine the effectiveness of the data communication system?

The effectiveness of the data communication system depends on three fundamental characteristics:

Delivery: The system must deliver data to the correct destination.

Accuracy: The system must deliver data accurately.

Timeliness: The system must deliver data in a timely manner.

4. What are the advantages of distributed processing?

Advantages of distributed processing include security/encapsulation, distributed databases, faster problem solving, security through redundancy and collaborative processing.

5. Why are protocols needed?

In networks, communication occurs between the entities in different systems. Two entities cannot just send bit streams to each other and expect to be understood. For communication, the entities must agree on a protocol. A protocol is a set of rules that govern data communication.

6. Why are standards needed?

Co-ordination across the nodes of a network is necessary for an efficient communication. If there are no standards, difficulties arise. A standard provides a modelor basis for development to which everyone has agreed.

7. For n devices in a network, what is the number of cable links required for a mesh and ring topology?
Mesh topology – n (n-1)/2
Ring topology – n

8. What is the difference between a passive and an active hub?
An active hub contains a repeater that regenerates the received bit patterns before sending them out. A passive hub provides a simple physical connection between theattached devices.

9. Distinguish between peer-to-peer relationship and a primary-secondary relationship.
Peer-to-peer relationship: All the devices share the link equally. Primary-secondary relationship: One device controls traffic and the others must transmit through it.

10. Assume 6 devices are arranged in a mesh topology. How many cables are needed? How many ports are needed for each device?
Number of cables=n (n-1)/2=6(6-1)/2=15
Number of ports per device=n-1=6-1=5

11. Group the OSI layers by function.
The seven layers of the OSI model belonging to three subgroups. Physical, data link and network layers are the network support layers; they deal with the physical aspects

of moving data from one device to another. Session, presentation and application layers are the user support layers; they allow interoperability among unrelated software systems. The transport layer ensures end-to-end reliable data transmission.

12. What are header and trailers and how do they get added and removed?
Each layer in the sending machine adds its own information to the message it receives from the layer just above it and passes the whole package to the layer just below it. This information is added in the form of headers or trailers. Headers are added to the message at the layers 6,5,4,3, and 2. A trailer is added at layer2. At the receiving machine, the headers or trailers attached to the data unit at the corresponding sending layers are removed, and actions appropriate to that layer are taken.

13. The transport layer creates a communication between the source and destination. What are the three events involved in a connection?

Creating a connection involves three steps: connection establishment, data transfer and connection release.

14. What is the DC component?
Direct current is a zero-frequency signal with constant amplitude.

15. How does NRZ-L differ from NRZ-I?
In the NRZ-L sequence, positive and negative voltages have specific meanings: positive for 0 and negative for 1. in the NRZ-I sequence, the voltages are meaningless.
Instead, the receiver looks for changes from one level to another as its basis for recognition of 1s.

17. What are the functions of a DTE? What are the functions of a DCE?
Data terminal equipment is a device that is an information source or an information sink. It is connected to a network through a DCE. Amplitude
Time 1 0 0 0 0 0 0 0 0 0 0 1 0 0 3
Data circuit-terminating equipment is a device used as an interface between a DTE and a network.

17. What does the electrical specification of EIA-232 describe?
The electrical specification of EIA-232 defines that signals other than data must be sent using OFF as less than -3 volts and ON as greater than +3 volts. The data must be transmitted using NRZ-L encoding.

18. Discuss the mode for propagating light along optical channels.
There are two modes for propagating light along optical channels, multimode and single mode.
Multimode: Multiple beams from a light source move through the core in different paths.
Single mode: Fiber with extremely small diameter that limits beams to a few angles, resulting in an almost horizontal beam.

19. What is refraction?
The phenomenon related to the bending of light when it passes from one medium to another.

16 Marks

1. Explain the ISO-OSI model of computer network with a neat diagram.
2. Discuss the major functions performed by the Presentation layer and Application layer of the ISO OSI model.

3. Explain Transport Layer and Physical Layer.
4. What are the major components of an optical communication system? Discuss.
5. Distinguish between point to point links and multi point links. Give relevant diagrams.
6. Explain Data Link Layer and Network Layer.
7. Compare Connection oriented and connectionless service.