Computer Network Assignment
(CS601)

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1) Explain the utility of layered network architecture. Compare ISO-OSI and TCP/IP model.

Ans- The basic idea of a layered architecture is to divide the design into small pieces. Each layer adds to the services provided by the lower layers in such a manner that the highest layer is provided a full set of services to manage communications and run the applications

ISO/OSI Model	TCP/IP Model
a) OSI model provides a clear distinction between interfaces, services and protocols	a) TCP/IP doesn't have any clear distinguishing points between services, interfaces and protocols.
b) OSI refers to Open System Interconnection	b) TCP refers to Transmission Control protocol.
c) OSI follows a vertical approach	c) TCP/IP follows a horizontal approach.
d) OSI layer have seven layer.	d) TCP/IP has four layer.

2) Explain the different data transmission modes. What do you mean by protocol in networking

Ans- 1) Simplex Mode - In simplex Mode, Data can flow in only one direction means data communication is unidirectional. In this mode a sender can only send data but can't receive it similarly, a receiver can only receive data but can't send it.

Half duplex Mode - In half duplex mode, Data can flow in both direction at a time means when one node is sending the data, then the receiving node has to wait. When one device is sending the other can only receive and vice versa.

Full duplex Mode - In full duplex mode, Data can flow in both directions at the same time means a device can send as well as receive the data. It is bidirectional. Both sender and receiver devices can transmit data simultaneously.

1) network protocol is an established set of rules that determine how data is transmitted between different devices in the same network. Essentially it allows connected devices to communicate with each other regardless of any differences in their internal processes structure or design

3) Describe CSWA/CA with suitable flow chart.

Ans - The algorithm of CSWA/CA is :- when a frame is ready, the transmitting station check whether the channel is idle or busy.

if the channel is busy, the station waits until the channel become idle.

if the channel is idle the station starts transmitting and continually monitors the channel to detect collision.

if a collision is detected the station starts the collision resolution algorithm.

Flowchart :-

start CMSA/CA
↓
Initialize backoff
counter, C = 0
↓
Accept Prepared
Frame for
Transmission
↓
Wait IFG time
↓
Start Data Transmission
↓
Set a Timer   C = C + 1 ⟶ C > Cₗᵢₘᵢₜ
↓
Acknowledgment
received before
timeout
↓ Yes

Wait for backoff
time, T
↑

| Yes

Transmission
Successful

Abort
Transmission
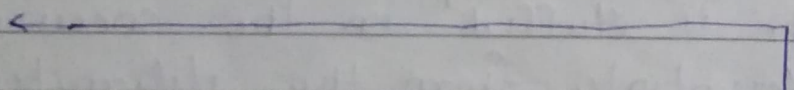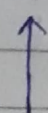
4) What are the services provided by Data Link Layer ? Explain bit stuffing and character stuffing.

Ans - The services provided by the data link layer :-

a) Encapsulation of network layer data packets into frame
b) Frame synchronization
c) In the Logical Link Control (LLC) Sublayer
d) In the medium.

Byte stuffing - A byte is stuffed in the message to differentiate from the delimiter. This is also called character oriented framing.

Bit stuffing - A pattern of bits of arbitary length is stuffed in the necessary to differentiate from the delimiter.

5) Briefly discuss the Go-Back-N selective repeat technique with example.

Ans - In Go-Back-N if a sent frame is found suspected or damaged then all the frames are retransmitted till the last packet. In selective repeat only the suspected or damaged frames are retransmitted. Sender window is of size N. Sender window size is same as N. Receiver window size is 1. Receiver window size is N. Go Back N is easier to implement. In selective repeat receiver window needs to sort the frames.

Efficiency of Go-Back-N is $N/(1+2a)$.

Efficiency of selective repeat $N/(1+2a)$

Acknowledge type is cumulative. Acknowledgement type is individual.

6) What is intranet? Why is coaxial cable superior to twisted pair cable? Differentiate between IP address and MAC address.

Ans- An intranet is a computer network for sharing information collaboration tools, operational replication and other computing services within an organization usually to exclusion of access by outsider

Coaxial cables support greater cable length. Twisted pair cables are thinner and less expensive. Coaxial cables are better shielded from crosstalk. Twisted Pair cables provide high transmission rates.

MAC Address	IP Address
a) Stands for Media Access Control Address	a) Stands for Internet Protocol Address.
b) It is six byte hexa decimal address	b) It is either four or eight byte address.
c) A device attached with MAC Address can retrieve by ARP protocol.	c) A device attached with IP Address can retrieve by RARP protocol.