The unit is bits per second (bps)
→ The signal rate is the number of signal elements sent in 1s. The unit is baud.

Question No 11:

ANSWER:

The number of bits in IPv4 is 32 and in IPv6 is 128 bits long.

Question No 12:

Answer:

classful addressing: assign an organization class A, class B or class C block of address

classless addressing: assign an organization a block of contiguous addresses based on its needs

Question No 13:

ANSWER:

Class A, B, and C are used for unicast communication. class D is for multicast communication and class E addresses are reserved for special purposes. unicast may be the saying used to go into detailed connection when a bite of data is mailed derived from one of point to the other point in this case there is just one single equal sender and something recipient. chiefly transmission in which a mail based is actually routed from a individual origin to some specific getaway

*) in packet switched network: the data are packetised: each packet is somehow an independent entity with its local or global addressing information

• space devision and time devision switches:

*) in space-division switch, the path from one device to another is specially separate from other paths. the inputs and the outputs are connected using a grid of electronic micro switches

* in a time devision switch. The inputs are divided in time using TDM. A control unit sends the input to the correct output devices

Q No: 3

ANS: **Noiseless:**

We have an ideal channel, in which no frames are lost, duplicated, or corrupted channel. The first is a protocol that does not use flow control. the second is the one that does off course. neither has error control b/c we have assumed that the channel is a perfect noiseless channel

the two protocol the simplest and wait

Noisy channel:

The stop and wait protocol gives us an idea of how to add flow control to its predecessor, noiseless channels are non existent we can ignore the error (as we sometime do) or we need to add

No: 1

Briefly describe the services provides by the data link layer:

Answer:

Pack bites is need by the data link layer * frames message is divided into smaller entities by framing to make flow and error control more manageable.

Question No 2:

ANSWER:

* **Byte-oriented and bite oriented protocols**

*) in a **byte-oriented protocol.** [illegible] a coding system the data to be carried are 8 bites characters. when only text was exchanged by the data link layer then data oriented protocols were popular.

* **in a bite-oriented protocol:**

The data section of a frame is a sequence of bites. Bite oriented protocols are more popular today B/C we need to send text, graphic, audio, and video which can be bettes represented by bite pattern than a sequence of characters.

a) **Byte-stuffing and bit stuffing:**

ANS: character oriented protocols use byte stuffing to be able to carrying on a bite pattern that the same as the flag.

Page (11)

Q No 19:

ANS:

(a) [illegible]

(b) [illegible]

Q No 20:

ANS:

(a) 127.240.103.125

(b) 175.192.248.192

Q No 21:

ANS:

in a block of addresses, we know the IP adres of the host is 25.34.12.56/16 one host, first address: 132.44.32.1

Network address: 182.44.

(1) in a block of addresses, we know the IP adress of the host is 25.34.12.56/16

(2) one host, first address: 132.44.32.1

Network address: 182.44.32.0

last address: 182.44.32.254

Limit address

Page 3

*) **in packet switched network:** the data are packetized: each packet is somehow an independent entity with its local or global addressing information.

* **Space division and time division switches:**

*) in space-division switch, the path from one device to another is spacially separate from other paths. The inputs and the outputs are connected using a grid of electronic micro switches.

* in a time division switch. The inputs are divided in time using TDM. A control unit sends the input to be correct output devices.

Q NO: 3

Ans: Noiseless:

We have an ideal channel: in which no frames are lost, duplicated, or corrupted channel. The first is a protocol that does not use flow control. The second is the one that does of course, neither has error control etc we have assumed that the channel is a perfect noiseless channel.

The two protocol the Simplest and wait

Noisy channel:

The stop and wait protocol gives us an idea of how to add flow control to its predecessor, noiseless channels are non existent we can ignore the error (as we sometime do) if we need to add

page 2

* **Flow control and error control:**

Flow control: Flow control: is a set of procedures used to restrict the amount of data that the sender can send before waiting for a knowledgement it is done by flow control

* **error control:** error control is a set of procedures used to detect and correct errors

*) **HDLC and PPP:-**

*) **HDLC** is a bit oriented protocol for communication over point to point and Multi point links

* **PPP** is a byte-oriented protocol used for point to point links

* **Go-Back-N ARQ protocol and selective-Repeat ARQ protocol:-**

*) in the "Go-Back-N ARQ protocol" we can send several frame before recieving acknowledgements if a frame is lost or damaged, all outstanding frames sent before that frame are resent

* **in selective-Repeat ARQ protocol:** we avoid unnessery transmission by sending only the frame that are crupted are missing. Both Go-Back and Selective-Repeat protocols use sliding windows.

* **Circuit switched network and packet switched network**

* in a circuit switched network data are not packetized: data flows as some stream: a continuation of bite that travel the same channel during the data transfer phase

architecture used in the internet from 1981 until the introduction of classless inter Domain Routing in 1993. The methods divides the IP adrets adress bite class A, B and C provide unicast addresses for network of the different network sizes.
most notably in the default configuration of subnet masks.

Question No 14:

Answer:

Mask in IPv4 addressing:

A subnet mask hides (or masks) the network part of a system's IP address and leaves only the host part as the machine identifier. It uses the same format as an IPv4 address - four sections of one to three numbers separated by dots.

Default mask in IPv4 addressing:

The default subnet mask for class A IP address is 255.0.0.0 which implies that class A addressing can have 126 networks (2^7-2) and 16777214 hosts (2^{24}-2).
Subnetting is the process of dividing a class B or C network into subnets, as we've seen in the preceding topics. However this default case is the ...des for the more practical subnett-
...

or other special purposes. They cannot be assigned to hosts if ... these ... to translate the packets received and ... them to the ... host that ... that ...

Q No 17:

ANS:

One address addresses one byte using 16 bites you can write 65536 ... and address 65536 bytes. 16 bit integers, memory addresses or other data ... are those that are 16 bites wide ... 16 bite CPU and ALU architectures are that are based on registers address busses of that size. 16 bite micro computers are computers in which 16 bit microprocessors were the norm. With 16 bite memory addresses can segments with 16 bit segment offsets ... be accessed.

Q No 18:

ANS:

Addressing within a 1024 word page requires 10 bites b/c 1024 = 2^{10} ... the logical address space consists of ... pages, the logical addresses must 10+3 = 13 bites. Similarly location ... characterizes a shape of ... 4096 bites are needed.

Q NO 15:

ANSWER:

A mask is a 32 bit binary number that gives the first address in the block (the network address) when bitwise anded with an address in the block. The network address is the beginning address of each block. It can be found by applying the default mask to any of the addresses in the block.

The network address in a block of addresses is the first address and defines the organization itself to the rest of the world. How can we find the network address if one of the addresses in the block is known? The mask can be anded with any address in the block to give the network address.

Q NO 16:

ANS:

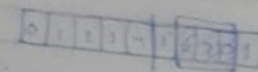
A NAT (is the virtualization of addresses. NAT helps improve security and decrease the number of IP addresses an organization needs. NAT gateways sit between the networks, the inside network and the out side network. Theoretically there are 2^32 IPv4 addresses. a little more than 4 billion IPv4 addresses. the number of the addresses in a network are reserved for broadcasting, multicasting

window remains in 4 bitsize

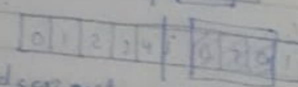
Answer C:-

After A send frame 3,4 and acknowledges 4 and the ACK is received by A.

a) sender:-



b) Receiver:-



Acknowledgement receive for two bit

Question No: 7

Answer:-

The three different techniques are described below.

1) line coding
2) block coding
3) scrambling

Question No: 8

Answer:-

i) signal elements is the shortest unit of digital signal. signal element are what we can send signal element are the carrier.

~~Signal elements is the shortest~~

ii) Data element is the smallest entity that can represent a piece of information (a bit). data element are what we need to send data element are being carried.

Question No: 9

Answer:- The data rate defines the number of data elements (bits) send ...

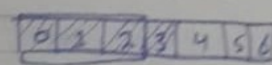
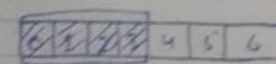
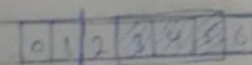
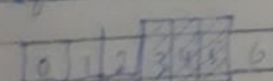
error control to our protocols in this section that uses error control.
protocols:
1) stop and wait ARQ:
We can say that stop and wait ARQ protocol is actually a Go-Back-NARQ in which there are only two sequence members and send window size is 1

Go Back NARQ:
in This protocols we can send several frames acieving acknowledgment.

2) selective-Repeat ARQ:
in this protocol we send only corrupted or missing files

Question No 4:-
ANS
Piggy backing is used to improve the efficiency of bidirectional transmission. a frame is carrying data from A to B, it can also carry control information about frames from B when a frame is carrying data from B to A. it can also carry control information about frame from A.

Question No 5:-
Answer:-
in multistage switching blocking refers to times when one input cannot be connected to an output because there is no path available between them all the possible intermediate switches are occupied one solution to blocking is to increase the number of intermediate switches based on the the criteria

Question No: 6
Answer:
Before A send any frame
sender

window PDU that may be transmit without...
Reciever

Answer:b
After A sends frame 0,1,2 and receives acknowledgement from B for 0 and 1, suppose B received all three frames.
sender:
A has shrunk its window as it has transmitted three PDUs but has received ack for 0 and 1 PDUs hence it is keeping copy of one PDU

Acknowledgement recieved for two bit
Reciever:

Reciever has recieved all the data hence