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Question # 01:

Benifly describe the services provided by the data link layer.

ANSWER # 01:-

It specifies the structure of the frame as well as a channel access Protocol by which frame is to be transmited over the link. Relaible delivery: Data link Layer provides a relaible delivery service i.e transmits the network layer datagram without any error.

Question # 2.

Compare and contrast byte-oriented and bit-oriented Protocols.

ANSWER # 2.

- Byte-oriented Protocol:.

In this field upto 8 bits is allocated 1 byte. Fields upto 8-16 bits is given double byte. There are typically used in softwares as it is easy to process them. this will be loose packing of data

Compare to bit-oriented Protocol.

BiT- oriented Protocol:-

In this any field can be an arbitrary number of bits long. So if the field only needs 6 possible values, it can be only 6 bits long. They are typically used in hardware where bandwidth is an important consideration, this will allow tighter packing of data

Question :.

Byte-stuffing and bit stuffing:-

ANSWER:-

Byte-stuffing:. Byte-stuffing is the Processe of adding 1 extra byte whenever there is aflag or escape character in the text.

BiT-stuffing:- Bit-stuffing is the process of adding one ~~or~~ extra 0 whenever five consecutive 1s follow a 0 in the data. so that the recivier does not mistake the pattern 01111110 for a flag.

the encapsulation of the data transported in the point-to-point links and it could be synchronous or asynchronous.

Question

Go-back-N ARQ protocal and Selective-Repeat-ARQ-protocal.

ANSWER:

The main difference b/w these two protocols is that after finding the suspect or damage in sent frames Go-back-n protocal re-transmits all the frames whereas selective repeat protocal re-transmits only that frame which is damaged.

Question:-

Circut-switched network and a packed-switched network.

ANSWER:-

circut-switched is connection oriented that means a path is established b/w source and destination before the transmission occurs.

Question

• Flow control and error control.

ANSWER:

In data communications, flow control is the process of managing the rate of data transmission b/w two nodes to prevent a fast sender from overwhelming a slow receiver. Flow control should be distinguished from congestion control. which is used for controlling the flow of data when congestion has actually occured.

ERROR control:

The error control observe that the ~~co~~ data delivered to the receiver is error free and relaible.

Question

◎ HDLC and PPP.

ANSWER:-

The major difference b/w HDLC and PPP is that HDLC is the bit-oriented-protocal while PPP is the character-oriented protocal... on the other hand, the ppp protocal deals with

on the other hand, packed switching is connectionless that means a dynamic route is decided for each packet while transmission.

Question

⇒ space-division and time-division switches :-

ANSWER:

In a " space-division switch, the path from one device to another is spatially separate from other paths. The inputs and the outputs a connected using a girid of electr microswitches. In a time-divis switch, the inputs are divided time using TDM. A control u sends the input to the correc output device.

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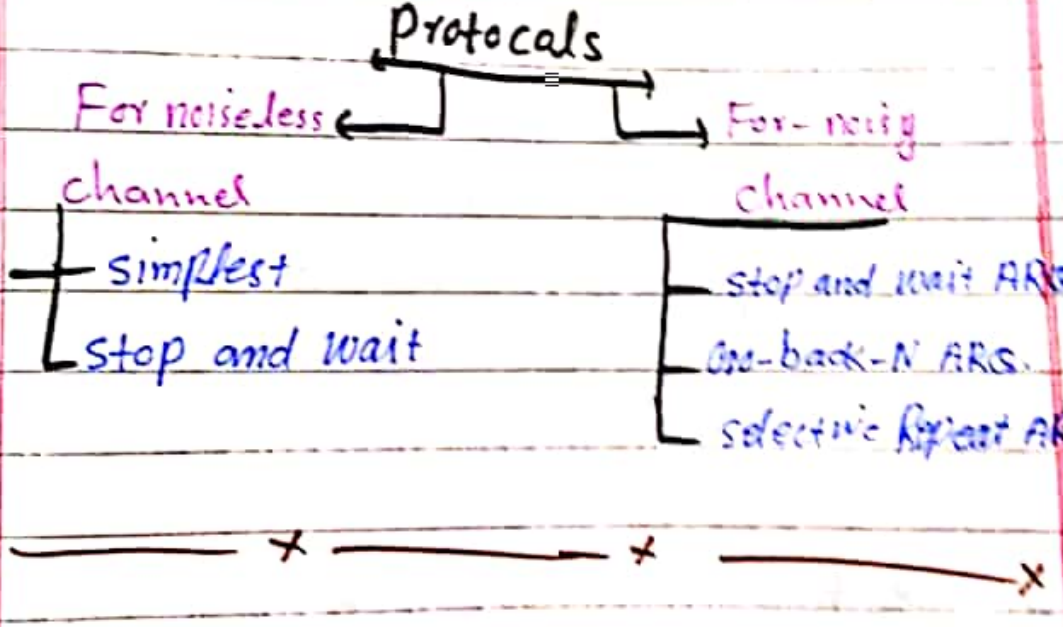
Question # 3.

Explain the protocal for nois and noisey channel.

ANSWER # 3.

Noiseless and Noise channel protocols is the sender sends a sequence of frames without even thinking about the receiver... Note that the data frames are shown by tilted boxes: the hight of the box defines the transmission time difference b/w the first bit and the last bit in the frame.



Question #4.

Explain piggybacking in HDLC.

The receiver waits until its network layer passes in the next data packet. The delayed acknowledgement is then attached to this outgoing data frame. This technique

of temporarily delaying the acknowledgement so that it can be hocked with next outgoing data frame is known as piggybacking.

Question # 5

Explain blocking in a switched:.

ANSWER: # 5

In multistage switching blocking refers to times when one input cannot be connected to an output because there is no path available b/w them all the possible intermediate switches are occupied. one solution to blocking is to increase the number of intermediate switches based on the close criteria.

Question # 6

Two neighboring nodes (A and B) use a sliding-window protocol with a 3-bit sequence number. As the ARQ mechanism, go-back-N is used with a window size of 4. Assuming A is transmiting and B is receiving, show the window position for the following succession

of events.

⊙ Befor A sends any frames

⊙ After A sendes frames 0, 1, 2 and receives acknowledgment from B for 0 and 1.

⊙ After A sendes frames 3, 4 and 5 and B acknowledges 4 and the ACK is received by A.

Answer # 6.

ⓐ Befor A sends any frames.

Sender : | 0 | 1 | 2 | 3 | 4 | 5 | 6 |

window of PDU that may be transmited = 4-bit window.

Receiver : | 0 | 1 | 2 | 3 | 4 | 5 | 6 |

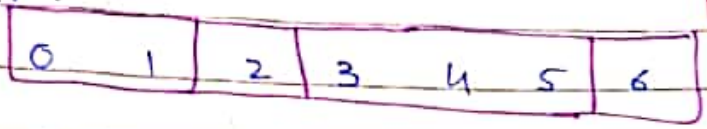
b) After A sendes frames 0, 1, 2 and receivers acckowledgement from B for 0 and 1.

A has shrunk its window as it has transmited three PDUs but has recewied ask for 2 PDUs. Hence it is keeping copy of one PDU.

Sender : | 0 | 1 | 2 | 3 | 4 | 5 | 6 |

Acknowledgment received for two bits.

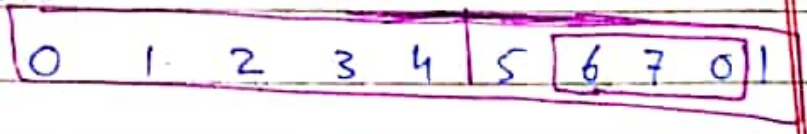
Receiver:



Receiver has received all data hence the window remains in 4-bit size.

(c) After A sends frames 3, 4 and 5 and B acknowledges 4-bit and the Ack for is received by A.

Sender:



Question # 7

List three techniques of digital-to-digital conversion.

ANSWER:

Digital-to-digital conversion:

Three techniques of digital-to-digital conversion: line coding, block coding and scrambling.

Line coding is always needed. block coding and scrambing may

or may not be needed. Line coding

Line coding:

Line coding is the process of converting digital data to digital signals. Line coding converts a sequence of bits to a digital signals. At the sender, digital data are encoded into a digital signals.

Question # 8

Distinguish b/w a signal element and a data element:

ANSWER # 8

A Data element is the smallest entity that can represent a piece of information (a bit). A signal element is the shortest unit of a digital signal. Data elements are what we need to send, signal elements are what we can send data elements are being carried: signal elements are the carriers.

Question # 9

Distiguish b/w data rate and signal rate:

Question #(11)

What is the number of bits in an IPV4 addresses? What is the number of bits in an IPV6 addresses?

Answer # 11.

An IPV4 address is 32 bits long. An IPV6 address is 128 bits long. IPV4 uses 32-bit (four-byte) addresses, which limits the address space to 4294967296

Question # 12

What are the difference b/w classful addressing and classless addressing in IPV4?.

Classful addressing assigns an organization a class A, class B or class C block of addresses. classless addressing assigns an organization a block of contiguuous addresses based on its needs... classless addressing use a variable number of bit for the network and host portions of the address.

Question # 13.

List the classes in classful and defin

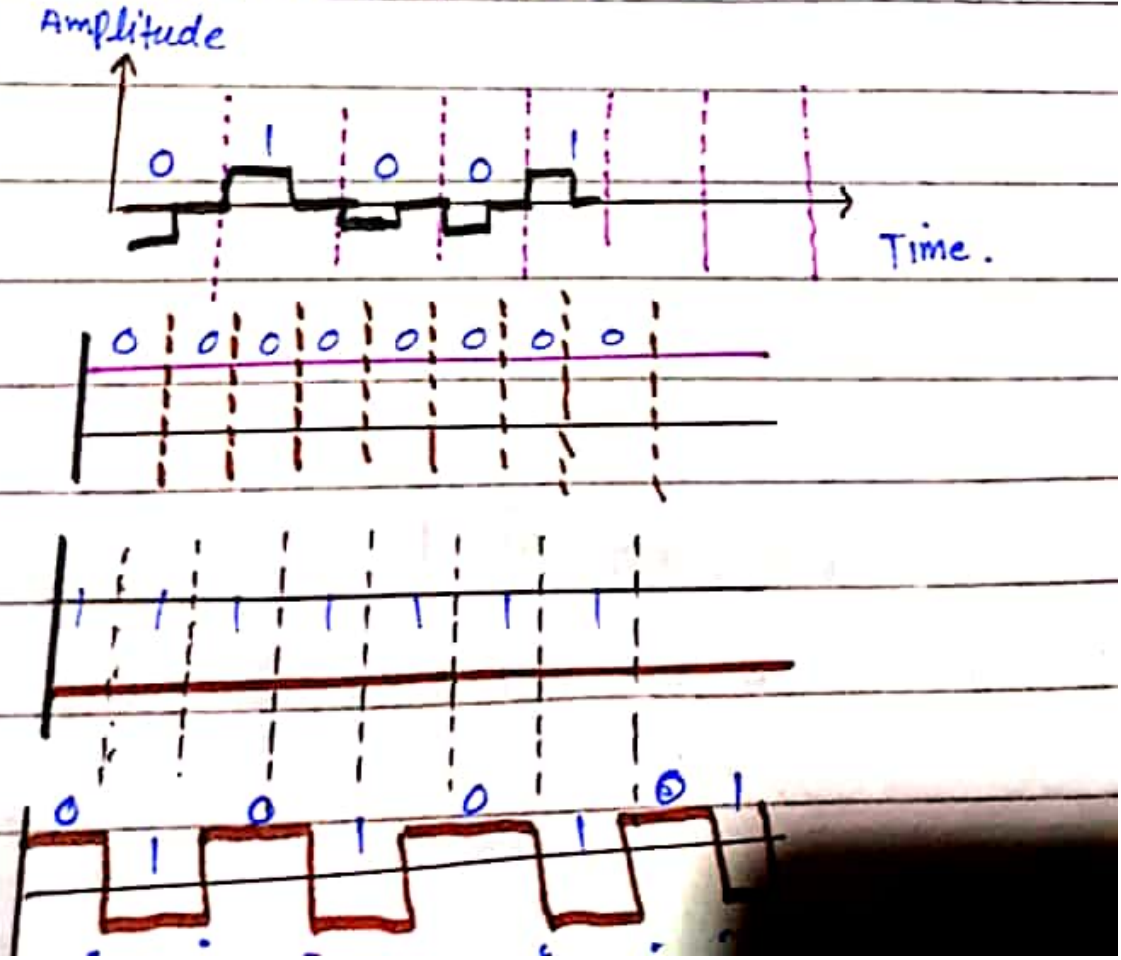
ANSWER # 9

Distinguish b/w data rate and signal rate. Data rate is also known as bit rate and it defines the # of data elements / bit sent is 1s. signal rate is also known as the Pulse rate and it is the # of signals elements sent in 1s. Data rate unit is bps and signal.

Question # 10

Draw the graph of the NR2-L- scheme using each of the following data streams, assuming that the last signal level has been positive. From the graphs, guess the bandwid for has scheme.

ANSWER # 10.



the application of each class (unicast, multicast, broadcast or reserve).

ANSWER # 13.

Classes A, B and C are used for unicast communication. class D is for multicast communication and class E addresses are reserved for special purpose" unicast may be the saying used to go into detail connection when a bit of data is mailed derived from one of point to the other point.

Question # 14.

Answer # 14.

An IP addresses has two components, The network address and the host address... A subnet mask is a 32-bit number that masks an IP address, and divides the IP address into network address and host address. subnet mask is made by seting network bits to all "1"s and seting host bits to all "0"s -

The default subnet mask for class A IP address is 255.000 which implies that class A addressing can have 126

networks ($2^7 - 2$) and 16777214 hosts ($2^{24} - 2$).

Question # 15.

ANSWER # 15.

The network address is the first address. The network address defines the network to the rest of the internet. In classful addressing, the network address (the first address in the block) is the one that is assigned to the organization. Given the network address 17.0.

Question # 16

ANSWER # 16.

A NAT (Network Address Translation or Network Address Translator) is the virtualization of internet protocol (IP) addresses. NAT helps improve security and decrease the # of IP addresses an organization needs. NAT gate ways sit b/w two network, the inside network and the outside network.

Question # 17.

Answer # 17.

one address addresses one byte.

Using 16 bits, you can write 65536 addresses (from 0 to 65536, that's 65536 different addresses). and address 65536 bytes. 65536 bytes is 64KB. in compiler science b is bit, B is byte.

Question # 18

Answer # 18

Addressing within a 1024-word page required 10 bits because $1024 = 2^{10}$. since the logical address space consists of $8 = 2^3$ pages, the logical addresses must be 10+3 = 13 bits. similarly, since there are $32 = 2^5$ physical pages, physical addresses are 5+10 = 15 bits long.

Question # 19

Change the following IP addresses from dotted-decimal notation to binary notation.

a) 129.14.6.8.

b) 208.34.54.12.

Answer # 19

a) 129.14.6.8

129 = 1000001
14 = 1110
6 = 110
8 = 1000
Hence
129.14.6.8
10000011110 110 1000

b) 208.34.54.12.

208 = 11010000
34 = 100010
54 = 110110
12 = 1100
Hence,
208.34.54.12
11010000.100010.110110.1100.

Question # 20

Answer # 20

a) 01111111 1111.0000 011 00111 01111101

b) 10101111 11.000000 11111000 00011101

a) ~~125~~. 240. 103. 125

b) 175.192.248.29.

Question # 21.

ANSWER # 21.

In a block of addresses. we know the IP address of the host is 25.34.12.56/16 one host. first address 189.44.89.1 Network address 189.44.

1) In a block of addresses we know the IP address of the host is 25.34.12.56/16. one host, first addresses 25.34.0.1 Network address 25.34.00.

Last address: 25.34.255.255.

Limited address 25.34.255.255.

mi block.

2) one host, first address 189.44.89 Network address 189.44.89, o Last address: 189.44.89.254 Limited. address.

Ended.

Thank you.