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Q1 Briefly Describe.

(a) Briefly describe the layers in the internet model are the network support layers?

Ans(a) physical, data link and network layers

are network support layers and session, presentation and application layers are user support layers. The transport layer links these layers by segmenting and rearranging the data and both the OSI & TCP/IP Models for network layer help us.

(b) Describe three types of transmission impairment.

(b)

Ans) The three types of transmission impairments: attenuation, delay, distortion and noise.

This mean that the signal impairment at the begining of the medium is not the same as the signal at the end of the medium. what is sent is not what is recived.

(b) 1) Attenuation:

mean a loss of energy. when a signal, simple or composite, travel through a medium. it loses some of its energy in over coming the resistance of the medium.

(2) Distortion:-

mean that the signal changes its form or shape. Distortion can occur in a composite signal made of different frequencies. Each signal component has its own propagation speed through a medium and, therefore, its own delay is arriving at the final destination.

(3) Noise :-

Noise is another cause of impairment. Several types of noise, such as thermal noise, induced noise, cross talk and impulse noise may corrupt the signal. Thermal noise is the random motion of electrons in a wire creates an extra signal not originally sent by the transmitter.

Q2(C) what does the shanon capacity have to do with communications?

Ans c shanon information capacity C has long been used as a measure of the goodness of electronic communication channels. it specifies the maximum rate at which data can be transmitted without error if an appropriate code is used (it took nearly a half-century to find codes that approached the shannon capacity).

Q1
(D) Compare and contrast flow control and error control.

Ans D The main difference between the flow control and error control is that the flow control observes the proper flow of the data from sender to receiver on the other hand, the error control observes that the data delivered to the receiver is error free and reliable.

To ensure reliable communication, there needs to exist flow control (managing the amount of data the sender sends) and error control (that data arrives at the destination error free).

Q1

(e) Explain piggybacking and its usefulness in white layer of OSI is it used and why?

Ans (e) piggy backing is sometimes referred

to as "wifi squatting" The usual purpose of piggybacking is simply to gain free network access rather than any malicious intent but it can slow down data transfer for legitimate users of the network

in piggy backing, the sender sends a data packet along with the acknowledgment if any acknowledgment needs to send at the time of transmission of the data packet.

(f) Brief HDLC w.r.t station types transfer modes, frame types supported and flag field purpose?

Ans f HDLC is a group of data link protocols used to transmit synchronous data packets between point-to-point nodes.

start (f)

Ans 1 High-level Data link Control (HDLC) is a group of communication protocols of the data link layer for transmitting data between network points or nodes. Since it is a data link protocol, data is organized into frames. A frame is transmitted via the network to the destination that verifies its successful arrival.

All Frames carry a field of size 1 bit which is known as the "poll/finel" bit and is used by the check pointing procedure to verify correct transmission. HDLC define currently two formats for frames which carry sequence number. These types of frame are used to provide the reliable like service.

Q1(g) Brief the protocols for noiseless channel

Ans g1 stop-and-wait protocol is data link layer protocol for transmission of frames over noiseless channels. it provides unidirectional data transmission and with flow control facilities but without error control facilities.

Q1 (H) what is differential encoding? Also explain the difference between NRZ-L and NRZI. And hence the coding schemes of multilevel binary & bipolar

Ans) Differential encoding :-

In digital communications, Differential encoding is a technique used to provide unambiguous signal reception when using some types of modulation. It makes data to be transmitted to depend not only on the current signal state, but also on the previous one.

For NRZ-L (NRZ level) the level of the voltage determines the value of the bit, typically binary 1 maps to logical level high, and binary 0 maps to logical level low and for NRZ-I (NRZ-Invert) two-level signals has a transition at a boundary if the next bit that we are going to transmit is a logical 1 and does not have.

Name is unipolar, polar and Bi-polar line coding schemes.

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Q2(I) Suppose a computer sends a packet at the network layer to another computer somewhere in the internet. The logical destination address of the packet is corrupted. What happens to the packet? How can the source computer be informed of the situation?

Q2
ANS I) Before using the destination address in an intermediate or the destination node, the packet goes through error checking that may help the node find the corruption (with a high probability) and discard the packet. Normally, the upper layer protocol will inform the source to resend the packet.

The source computer be informed of the situation that the most protocols issue a special error message that is sent back to the source in this case.

Q2 j) A device is sending out data at the rate of 1MPs. How long does it take to send out a signal character (8 bits)?

Ans) Bit rate is the number of bits per second. that is bit rate = bits/sec

1000 bits are sent for 1 sec, therefore 10 bits require $10/1000 = 0.01$ sec

$$(8/100)s = 0.01s$$

Q2 k) we have a channel with 4kHz bandwidth. if we want to send data at 100 kbps what is the minimum SNRdB? what is SNR?

Ans k)

we can use the approximate formula

$$C = B (SNR_{dB})^{1/3}$$

$$\text{or } SNR_{dB} = (3C/B)^3$$

we can say that the minimum

$$SNR_{dB} = 3 \times 100 \text{ kbps} / 4 \text{ kHz} = 75 \text{ dB}$$

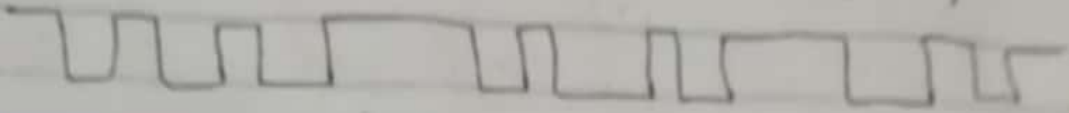
This means that the minimum

$$SNR = 10^{SNR_{dB}/10} = 10^{7.5} \approx 31.6227766 \text{ dB}$$

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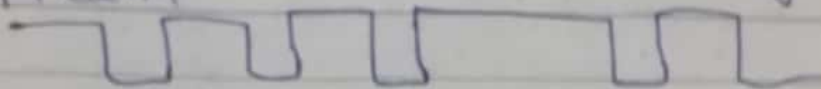
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Q3 L) The wave form here belongs to a Manchester encoded binary data stream. Determine the beginning and the end of the period, i.e. extract clock information and the given data sequence.



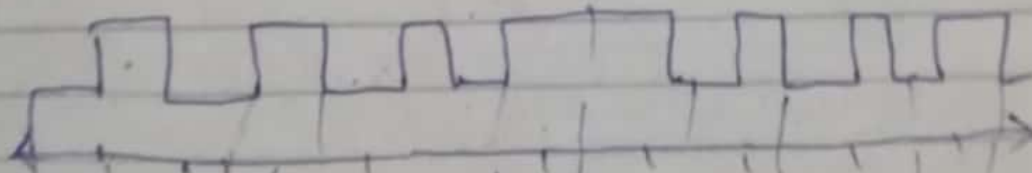
Q3
Ans L

The given wave form is a Manchester-encoded binary data stream



Manchester encoding:-

In the Manchester encoded binary data stream, a transition occurs in the middle of each bit period. The mid-bit transition in the data stream serves as a data bit and clock period.



The bit stream is :- 111100110

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Q3 M] Answer.

Ans M]

The Primary HDLC station in NRPM has sent the six frames (or a secondary). The Primary (less) count was three (or primary) prior to sending the six frames. If the Poll bit is on in the sixth frame, what will be the NRPM count back from the secondary after the last frame.