NAME : Muhammad Younis Afridi

I.D : 12701

Course : Computer Communication & networks.

BS (SE)

I.D: 12701 (1)

Q1 Briefly describe.

Q1(a) Briefly describe the layers in the internet mode are the Network Support layer?

Ans Network layer switching and routing technologies, creating logical paths, known as virtual circuits, for transmitting data from node to node. Routing and forwarding are functions of this layer, as well as addressing, internetworking, error handling, congestion control and packet sequencing.

Q1 (b) Describe three types of transmission impairment.

Ans 1. Attenuation
2. Delay distortion
3. Noise

P.T.O

Q1(b) 1. Attenuation; The impairment is caused by the strength of signals that degrades with distance over a transmission link.

2. Delay distortion:

The velocity of propagation of a signal through a guided medium varies with frequencies; it is fast at the center of the frequency, but it falls off at the two edges of frequencies. Equalization techniques can be used to smooth out the delay distortion. Delay distortion is a major reason for the timing jitter problem.

3. Noise: Impairment occurs when an unwanted signal is inserted

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between transmission and reception.

Q1(c) What does the Shannon capacity have to do with Communications?

Ans 2 Shannon ~~capacity~~ information capacity 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 a appropriate code is used.

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

Ans 3 Comparison.

flow control	Error control.
flow control is meant for the proper transmission	Error control is meant for delivering the error free data to the receiver.

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of the data from sender to the receiver.	
2. avoid overrunning of receivers buffer and prevents the data loss.	2. Detects and correct the error occured in the data.

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

Q1 (e)

Explain piggy backing and its usefulness. In which layers of OSI it is used and why.

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Ans 1(c) In reliable communication each packet has an acknowledgment from the receiver SCTP protocol is one of the examples of reliable transport layer protocol in the OSI model. piggybacking is an optimization method for the utilization of underlying network capacity.

Piggybacking

Piggybacking is a wireless communication context, is the unauthorized access of a wireless LAN. The usual propose of piggybacking is simply to gain free network access rather than any malicious intent.

01(5) Brief HDLC word Station types, transfer modes, frame type supporting and flag field propose?

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Ans:

HDLC, High-level data link control is a group of communication protocols of the data link layer for transmitting data between network points or nodes.

Transfer modes: HDLC supports two types of transfer modes normal mode and asynchronous balanced mode.

Normal mode

Here, two types of stations are there, a primary station that send commands and secondary station that can respond to received commands. It is used for both point-to-point and multiple communication.

Asynchronous balanced mode:

Here, the configuration is balanced, ie each station can both send commands and respond to commands. It is used for only point-to-point communications.

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Frame type supported.

I-frame

I-frame or information frames carry user data from the network layer. The also include flow and error control information that is piggybacked on user data. The first bit of control of I.fram is 0.

S-frame:

S-frame or Supervisory frame do not contain information field. They are used for flow and error control when piggybacking is not required. The first two bit of S.fram is 10.

U-frame;

U-frame or Un-numbered frames are used for myriad miscellaneous functions. like link management. It may contain an information field, if required. The bit two bits of U.fram is 11.

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flag field purpose.

- flag of it is an 8-bit sequence that marks the beginning and end of the frame. The bit pattern of the flag is 01111110.

Address: It contains the address of the receiver. If the frame is sent by the primary station, it contains the address of the secondary stations. The address field may be from 1 byte to several bytes.

Control: It is 1 or 2 bytes containing flow and error control information.

Payload: ~~It is~~ Data
This carries the data from the network layer. The length may vary from one network to another.

FCS: It is a 2 byte or 4 bytes frame check sequence for error ~~detection~~ detection. The standard code used is CRC.

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Q1 (g) Brief the protocals of noiseless channel?

Ans 2 stop-and-wait protocol is data link layer protocol for transmission of frames over noiseless channels. It provides unidirectional data transmission with flow control facilities but without error control facilities. This protocol takes into account the fact that the receiver has a finite processing speed.

Q1 h) What is differential encoding? Also explain the difference between NRZ-L and NRZI and name the coding schemes of multilevel binary and Bi-phase.

Ans 2 Differential encoding:

Differential encoding is a digital encoding technique where by a binary

value is denoted by a signal change rather than a particular signal state.

Difference between NRZ-L and NRZI

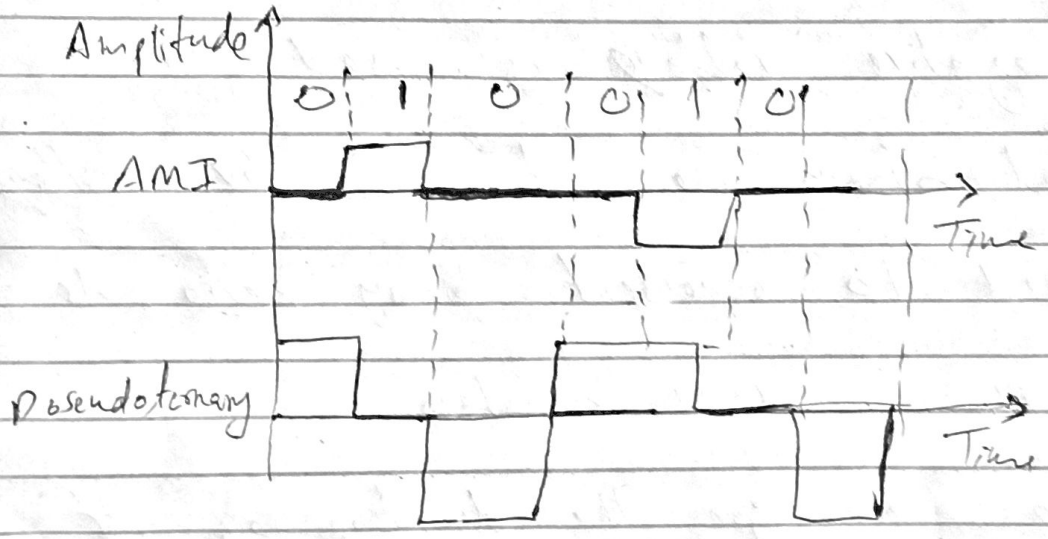
Non return-to-zero-level (NRZL) is a data encoding scheme in which a negative voltage is used to represent binary one and a positive voltage is used to represent binary zero, As with NRZL, NRZI maintains a constant voltage pulse for the duration of bit time. The data themselves are encoded as the presence or absence of a signal transition at the beginning of the bit time.

Coding Scheme of multilevel binary.

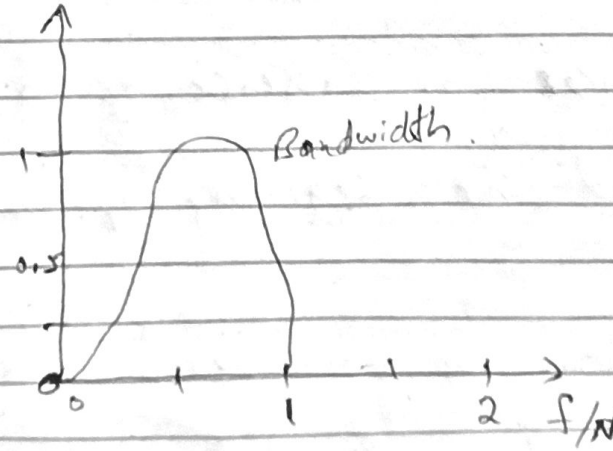
There are three voltage level. positive, negative, zero. The voltage level for

one data element is zero, while the voltage level for the other element alternates between positive and negative.

The figures show two variation of multilevel binary coding. AMI and Pseudo ternary.



$r = 1$ $\qquad S_{max} = \frac{1}{2}N$



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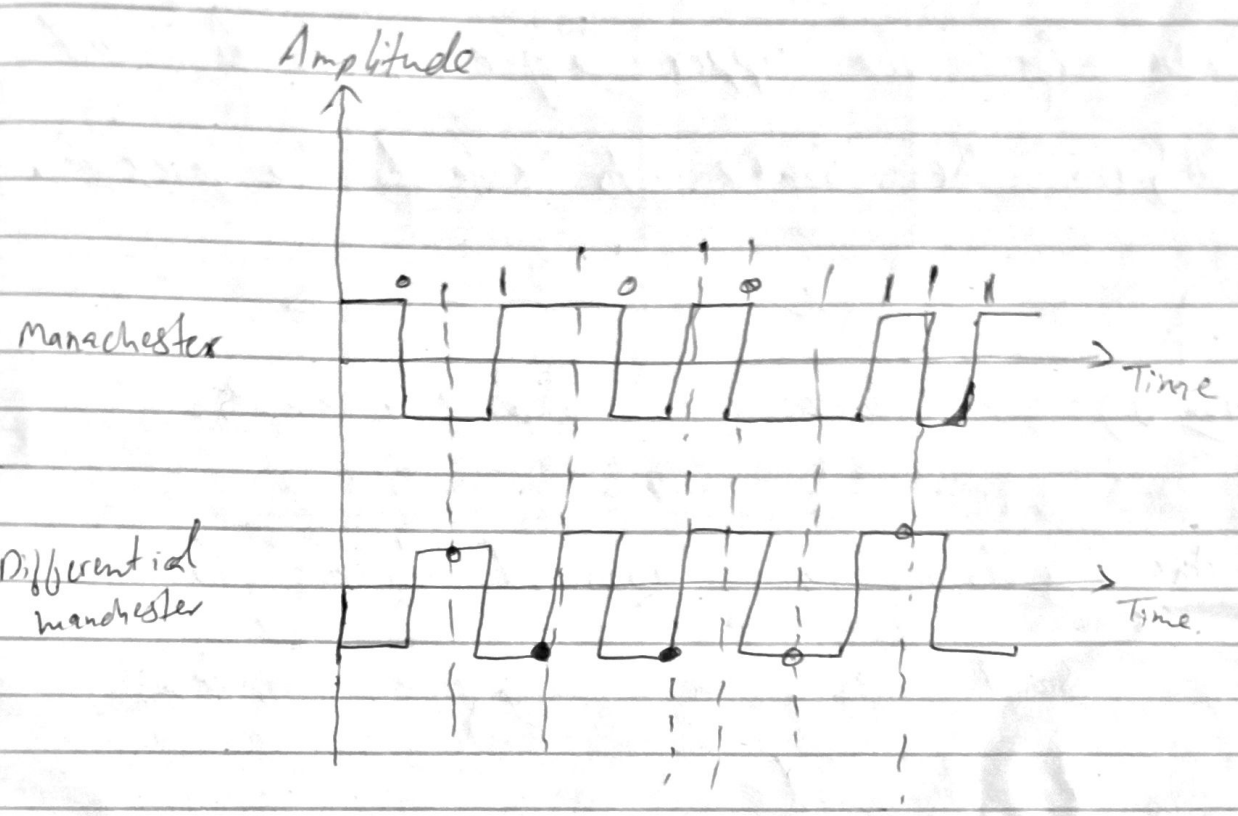
Coding Scheme of bi-phase.



0 - No inversion

● - Inversion

b) Suppose a computer ----

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 discards the packet. Normally the upper layer protocol will inform the source to resend the packet.

Q2 J) A device is sending .....

Ans: How long does it take to send out a single character of 8 bits

$8/1000$

$= 0.008$ Sec.

Q2 K) We have a channel with 4KHz .....

Sol: $C = B \times \log_2 (1+SNR)$

$100 * 10^3 = 4 * 10^3 \log_2 (1+SNR)$

$\log_2 (1+SNR) = 25$

$1 + SNR = 2^{25}$

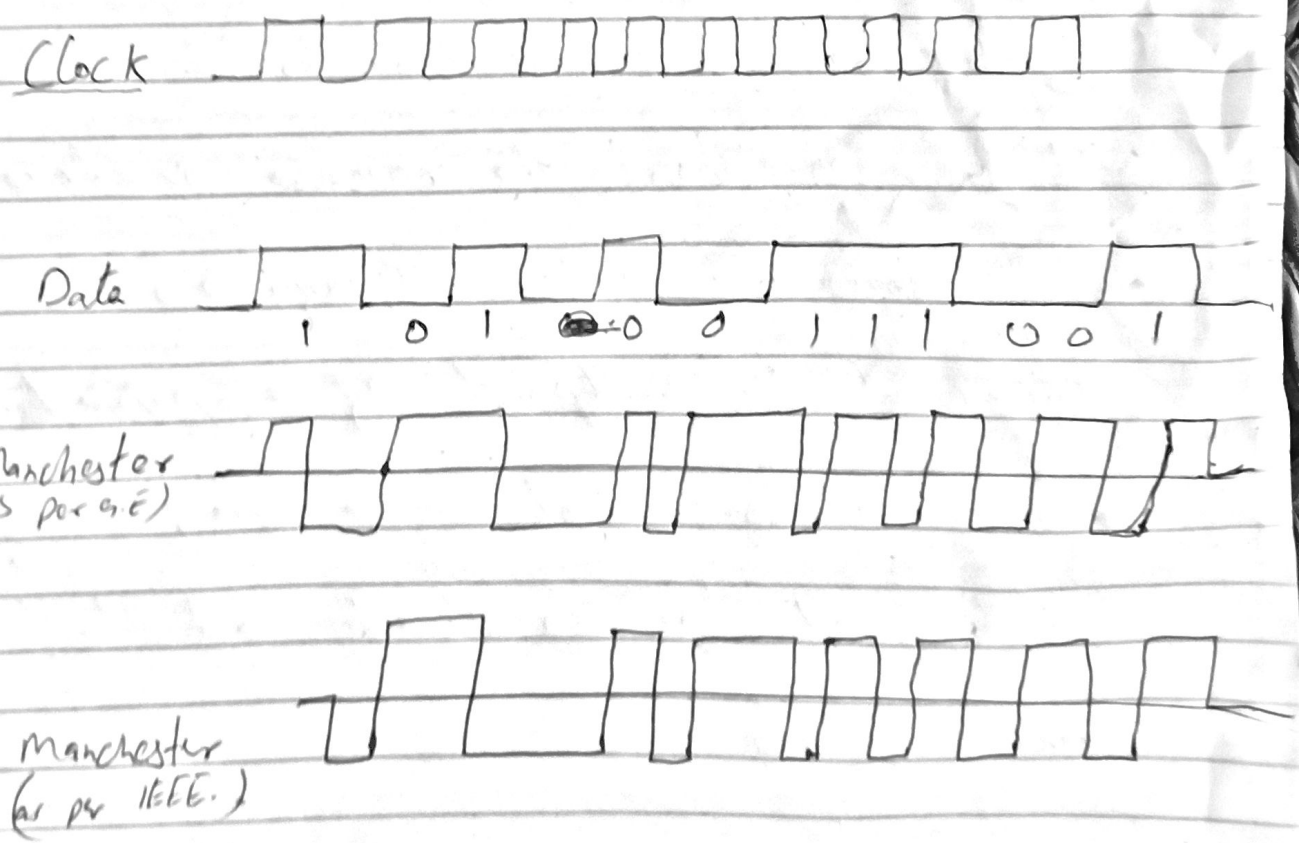
$SNR = 2^{25} - 1 = 33,554,431$

$$SNR_{dB} = 10\log_{10}(33,554,431) \simeq 75dB$$

SNR

Signal-to-noise ratio is a measure used in science and engineering that compares the level of a desired signal to level of background noise.

Q3 L) The waveform here .....



An example of manchester encoding showing both conventions for representation of data.

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original data		Clock		manchester value
0		0		0
	XOR ⊕	1	=	1
		0		1
1		1		0

Each bit is transmitted in a fixed time

- A 0 is expressed by a low-to-high transition, a 1 by low-to-low transition, (According to G.E Thomas Convention - in the IEEE convention, the reverse is true).
- The transitions which signify 0 or 1 occur at the midpoint of a period.
- Transitions at the start of a period are overhead and don't signify data

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Q3 m) Assume that the primary HDLC

T = n-bit frame to be transmitted

D = k-bit block of data - or message the first k bit of T.

F = (n-k) bit FCS the last (n-k) bits of T.

P = Pattern of n-k+1 bits, this is the predetermined divisor

$$\frac{2^{n-k} D}{P} = Q + \frac{R}{P}$$

There is a quotient and a remainder.

Because division is modulo 2 the remainder is always at least one bit shorter than the divisor we will use this remainder as our FCS. Then

$$T = 2^{n-k} D + R$$

Does the R satisfy

SIR. This Question is so difficult. I am sorry for this Question. please give me marks.