Page no 1:-

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Q NO: 1

Part (a)

1) Link Layer:

The internet consists of ends hosts, links, and routers. However, despite the obstacles we can hardly imagine, it has coughton. Data is delivered in packets.

2) Network Layer:

The most important layer is the network layer. It provides address and packages on the internet. A packet is an integral part of network.

3) Transport Layer:

TCP ensures that data sent from an application on one end of the internet is sent in the correct order to an application on the other end of the internet.

4) Application Layer:

There are obviously thousand of applications using the internet, Although each application is different

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Q No 1:

Part (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. It uses protocols like TCP and UDP.

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Q No 1:

Part(b)

There are three types of transmission impairments: attenuation, delay distortion, and noise.

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 propogation of a signal through a guided medium varies with frequencies.

③ Noise:

Impairment occurs when an unwanted signal is inserted between transmission and reception.

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Part (c)

Shannon 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).

Q No:- 1

Part (d)

Compare and Contrast flow control and error control.

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.

Compare and contrast ... error control. The main difference ... error. 1

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Q No 1-1

Part (e)

Piggybacking :-

Piggybacking means to ride over something. In a real example if someone already traveling towards a destination, with his bike where you go also need to reach, you just take the lift over the bike. If some one is not ridding or traveling, then you use your own bike for the ride, A similar concept in computer networks called Piggybacking.

Usefulness of Piggybacking.

In reliable communication, each packet has an acknowledgment from the receiver. SCTP protocol is one of the example of a reliable transport layer protocol in the OSI model. Piggybacking is an optimization method for the utilization of underlaying network capacity.

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Q No:-1

Part (~~B~~) (F)

## Station type

| Station types | Configuration | Response |
|---|---|---|
| Primary | unbalanced | Normal response mode |
| Secondary | Symmetrical | Asynchronous mode |
| Combine station | Balance configuration | ARM |

Transfer mode:-

Transfer mode is a switching technique used by telecommunication networks that use asynchronous time-division multiplexing to encode data in small, fixed-sized cells, this is different from Ethernet or internet, which use variable packets sizes for data or frames.

control
data delive
is rror free and

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Q1:-

Part (F)

Three types of Frame

i- U- Frame
ii- I- Frame
iii- S- Frame

Q1:-

Part (g)

Protocols

① Simplest ② stop and wait

① Simplest Protocols:
It has no flow or error control it is a unidirectional protocol in which data frames are traveling in only one direction - from the sender to receiver.

② Stop and wait:
If data frames arrives at the receiver site faster than they can be processed, the frames must be stored until their use. In the stop-and-wait protocol the sender sends one frame, stops until it receives confirmation from the receiver.

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Q1:-

Part (h)

Differential encoding:-

It is a digital encoding techniques where by a binary value is denoted by a signal change rather than a particular signal state.

Difference between NRZ-L and NRZ-I

NRZ-L

Non return to zero level the level of the voltage determines the value of the bit.

NRZ-I

Non return to zero Inverted If the bit is (0) zero there is no change. If the bit is one, there is change.

Bi phase coding
i- Bi-Phase coding
ii- Differential Manchester.

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Q No:-02

Part (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.

Q No:-02

Part (ii)

A device is sending out data at the rate of 1Mbps so it takes to send out a single character(8bits)

$$\left(\frac{8}{1000}\right)s = 0.008s = 8ms$$

Answer

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Question no 21-

Part (K)

what is SNR?

Signal-to-noise ratio (SNR) is a measure used in science and engineering that compares the level of a derived signal to the level of background noise also as the ratio of signal power to the noise power, often expressed in decibels.

We can use the approximate formula

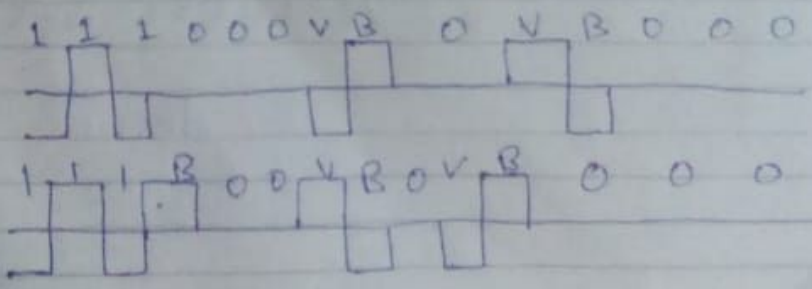
$C = B(SNR_{dB}/3)$ or $(SNR_{dB} = (3C)/B$

we can say that the minimum

$SNR_{dB} = 3 \times 100Kbps / 4KHz = 75$ #

this mean that the minimum

$SNR = 10^{SNR_{dB}/10} = 10^{7.5} \approx 31,622,776$ #



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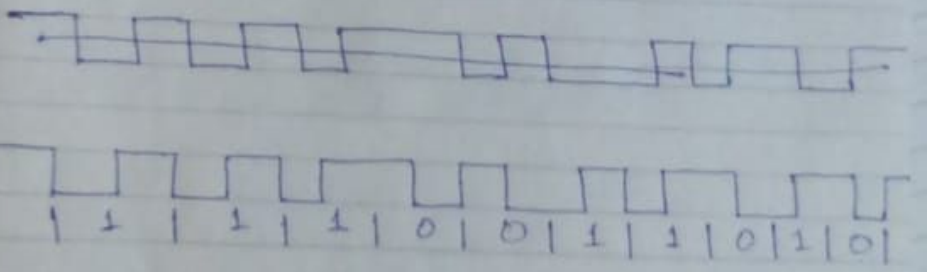
Question no 3:-

Part (L)

Answer:-

with Manchester, there is always a transition in the middle of bit period.



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Question no:- 03

Part (m)

A primary maintained a Separate logical link with each secondary station another link.

Combined station :-
Combined the feature of primary and secondary. A combined station may issue both Commands and responses.

the line like Configuration.

Unbalanced Configuration:-
Consist of at one primary and end or more secondary station and Supports both full / duplex and half duplex.

Balanced Configuration:
Consist of two Combine station and Support both full duplex and half duplex.

Question no 3 Part (iii)

NRM

used with an unbalanced carrying the primary may initiate out a transfer for a secondary.

ABM:-

used with a carrying. balanced either combined station may initiate transmission without asking.

ARM:-

used with a unbalanced carrying. The secondary may initiate transmission without explicity permits.