ID #12573 Pg (1)

Q① Briefly describe.

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

Ans:- Network Support layers:- The network support layers are physical layer, Data link layer and network layer.

① Physical layer:- In the seven-layer OSI model of computer networking the physical layer or layer 1 is the first and lowest layer. The Physical layer defines the means of transmitting raw bits over a physical data link connecting network nodes.

② Data link layer:- The data link layer or layer 2 of

OSI of computer networking. This layer is the protocol layer that transfer data b/w nodes on a network segment across the physical layer.

(3) Network layer:

The network layer is the third layer of the OSI model. It handles the service requests from the transport layer and further forwards the service request to the data link layer.

Q (b) Describe three types of transmission impairment:

Ans:- Transmission Impairment:-

Impairment causes

Attenuation Distortion Noise

(1) Attenuation:-

It means loss of energy. The strength of signal

decreases with increasing distance which causes loss of energy in overcoming resistance of medium.

(2) Distortion:-
It means change in the shape of signal. This is generally seen in the composite signals with different frequencies

(3) Noise:-
The random or unwanted signal that mixes up with the original signal is called noise.

(C) What does the Shannon capacity have to do with communication?

Ans:- 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 looks nearly a half-century to fully codes that approaches the Shannon capacity.

(d) Compare and contrast flow control and error control?

Ans Flow control and error control are the control mechanism at data link layer and transport layer. The main difference b/w the flow control and error control is that the flow control observes the proper flow of the data from sender to recievers, on the other hand, the error control observes that the data delivered to the recever is the error free and reliable

(e) Explain piggybacking and its usefulness In which layer of OSI is It used always

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Ans: Piggybacking data is a bit different from sliding protocol used in the OSI model. In the data frame itself, we incorporate one additional field for acknowledgment. Whenever party A want to send data to party B, It will carry additional ACK information in the Push as well

For example, If A has recieved 1 bytes from B, which sequence number starts from 12340 A will place "ACK 12345" as well in the current PUSH packet to inform B it has recieved bytes upto sequence no 12344 and expt to see 12345 next time.

⇒ Improve the efficiency, better use of availble channel bandwidth.

Pg (6)

(7) Brief HDLC w.r.t station types, transfer modes, frame types supported the flag field ?

Ans) High level Data link Control, ~~(HDLC)~~ (HDLC) is a group of communication protocols of data link layer for transmitting data between network points or nodes.

*) TRANSFER MODES :-

HDLC Support two types of transfer modes, normal response mode and asynchronous balanced mode.

*) NORMAL RESPONES Mode (NRM) :- 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 points-to-point and multipoints communication

* ASYNCHROUS BALANCED MODE (ABM).

Here, the configuration is balanced i.e. each station can both send Commands and respond to Commands. It is used for only point to communicatio

HDLC FRAME:-

HDLC is a bit oriented Protocol where each frame contains up to six fields. The structure varies according to

the type of frame. The Fields. The ~~Structure~~ Fields of a HDLC frame are.

Flag :- It is an 8-bit sequence that marks the begining and end of the fram

Address

Control

Payload

FCS.

*) TYPES OF HDLC FRAMES:-
These are three types of HDLC frame. The types of frame is determind by the Control field of the frame.

*) I Frame
*) S- Frame
*) U- Frame.

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(a) Brief the protocols for noiseless channels.

Ans. NOISELESS CHANNEL:-

An Ideal channel in which no frames are lost, duplicated or corrupted is regarded as Noiseless channel.

SIMPLEST PROTOCOL:-

*) In Simplest protocol, there is no flow control and error control Mechanism. It is unidirectional protocol in which data frames travel in only one direction (from sender to receive).

*) Also, the receive can immediately handle any received frame with a processing time that

is small enough to be negligible.

STOP AND WAIT PROTOCOL

*) The Simplest retransmission protocal is stop-and wait.

*) Transmitter (station A) sends a frame over the communication line and then waits for a positive or negative acknowledgement from the receiver (station B).

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(4) What is differential encoding? Also explain the difference - - - - - - - bi-phase.

Ans:- In digital communication, differential coding is a technique used to provide unambiguous signal reception. When using some types of modulati It makes data to be transmitte to depend not only on the current signal state, but also on the previous one.

ID-12573 Pg (12)

Q(2) (i) Suppose a computer sent packet at the network layer to another computer ------ of the situation?

Ans 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. There is no process with the destination port address running at the destination computer.

(j) A device is sending out data at the rate of 8 bit

Ans. A device is sending out data at the rate of 1000 bps.

Pg (13)

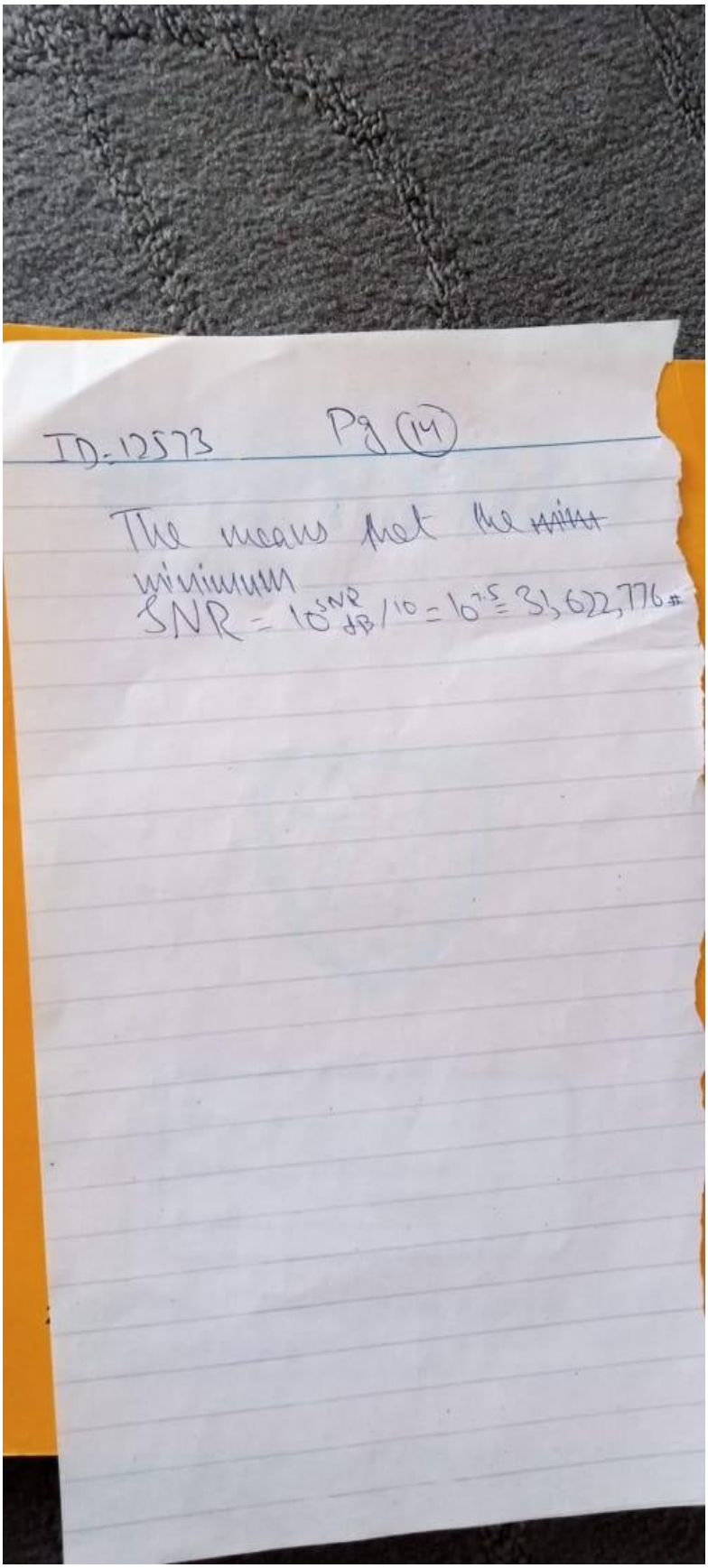
(a) How long it takes to sent out 10 bits?
$(10/100)_s = 0.01_s$

(b) How long does it takes to sent out a sigle character
$(8/100)_s = 0.008_s$ = 8ms Ans

(c) How ~~long~~ does ~~it~~ takes to ~~send~~ a file of 100,

(K) We have a channel with M Khz ------ SNR?

Ans We can use the approximate formula.
$C = B(SNR_{dB}/3)$ of
$SNR_{dB} = (3C)/B$
We can say that the minimum
$SNR_{dB} = 3 \times 100kbps / 4kHz$
$= 75_{dB}$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The means that the ~~minimum~~ minimum SNR = $10^{SNR_{dB}/10} = 10^{7.5} = 31,622,776$ #

P(15)

Osama Jamal ID# 12573

Question # 3:
Part (m):

Answer:

The desired number of a next frame that the secondary station predict to receive N(R) is 2 (010 in binary).

The N(R) count back for the next frame that the secondary station which is expects to receive will be 2 or 010 in binary representation.