1 Q (A) Briefly describe the layers in the internet model which are network support layers?

Ans Explanation:-

Network support layers are written below,

1. Physical layer
2. Data link layer
3. Network layer.

* PHYSICAL LAYER:-

The lowest layer of OSI model is concened with data communction between networking devicies and infrastructure.

* DATA LINK LAYER:-

Data link layer concerns data transmission between the nodes within a network and manages the connections between physically connected devicies such as switches.

* NETWORT LAYER:-

The thired layer of the OSI model organizes and transmits data between multiple networks.

(B) Describe three types of transmission impairment?

Ans TYPES OF TRANSMISSION IMPAIRMENT:-

* ATTENUATION:-

-> Attenuation means loss of energy
-> When a signal travel through a medium, it looes some of its energy in overcomming the resistance of the medium. That's why wire carrying electric signals gets warm.
-> Amplifires are used to amplify the signals
-> To check that signal is lost or gained unit of the decible are used.
-> The decible is negative if signal is attenuated and positive if amplified.

* DISTORTION:-

-> Distortion means that the signal changes its form or shape.
-> Distortion can occour in composite signal made of different franquencies
-> Each signal compoent has its own propagation speed through a medium and therefore, its own dely in arriving at the final distination.

P.T.O

→ The shape of composite signal is therefore not the same.

* NOISE:-

→ Noise another cause of impairement.

→ Several types of noise,

* thermal noise
* Include noise
* Cross talk
* impulse noise

* which may corrupt the signal

(C) What does shannon capacity have to do with the communction?

Ans Shannon information capacity has long been used as a measure of the goodness of electronic communction channels. It specifies the maximum rate at which data can be transmitted without error if an appropriate code is used.

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

FLOW CONTROL	ERROR CONTROL.
-> Flow control is meant for the proper transmission of data from sender to reciever.	Error control is meant for delivering the error free data to the reciever.
-> Feedback-based flow control and rate based flow control are the approaches to achieve the proper flow control	Parity checking, cyclic Redundancy code and checksum are the approaches to detect the error in data.
-> avoid over running of recievers buffers and prevents data loss.	Detects and corrects the error occoured in the data.

(E) Explain piggybacking and its usefullness. In which layer of OSI is it used and why?

Ans PIGGYBACKING AND ITS USEFULLNESS:-

Piggybacking means to overide something. It is used to improve the effiency of bidirectional transmission. When a frame is carrying data from A to B, it can also carry control information about frames from B; when frame is carrying data from B to A. It can also carry information about frames from A.

→ Piggybacking provides better use of bandwidth The underlaying cable and intermediate switches, router, etc will be less loaded. If someone is paying the cost to utilize a network based on messages, then the cost will be reduced.

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

Ans TRANSFER MODES:-

HDLC supports two types of transfer modes;

1- Normal purpose mode (NRM)
2- Asynchronous balanced Mode (ABM)

* NORMAL RESPONSE MODE:-

Two types of stations are present, i-e,

Priamary station, that sends commond.

• Secondary station, that can responsed to the recieved commond.

* ASYNCCHRONOUS BALANCED:-

The configuration is balanced here, i.e each station can both send commond and respond to the commonds It is used for point to point communction.

Q) Brief protocols for noiseless channels?

Ans* SIMPLE PROTOCOLS:-

It is unidirectional protocal in which data frames are travelling in one direction from sender to reciever only. It has no flow nor control.

* STOP AND WAIT PROTOCAL:-

If the data frames arrives at the reciever site faster than they can be processed then the frames must be stored, until their use.

In stop and wait protocol, one frame is sent, it stops untill it recieves conformation from the reciever and then the next frame is sent.

HDLC FRAME TYPES:-

There are three types of HDLC frames,

* **I-FRAME:-**
Information or i-frame carry user data from network layer.

* **S-FRAME:-**
Supervisiory or s-fram do not contain information field.

* **U-FRAME:-**
U-frame are used for mayraid miscellaneous functions like link mangment. if required it may contain field information.

Q1 (H) What is differential encoding? Also explain the difference between NR2-Z and NR21.' name the coding schemes of multiple level binary and bi-phase.

* DIFFERANTIAL ENCODING:-

Encoding in which signal significant conditions represents binary, data such as "0" and 1 are represented as changes to successding values.

NR2-L, Non return-to-zero-level is data encoding scheme in which a negative voltage is used to represent a binary one and a positive voltage is used to represent zero. As with NRZ-L, NR21 maintain a constant voltage pluse for the duration of bit time.

ID:13206

Q2 (i) Suppose a computer sends a packet at the network layer to another computer somewhere in the internet. The logical distination adress of the packet is corrupted. what happens to the packet? How can the source computer be informed of this stitution?

In general if there is a problem in a network bad enough to courrpt a packet, At transport layer 2 level. then the sender's adress is also courrpt. This is because the way a CRC checksum works. when a packet arrives malformed the checksum just tells the recieves the data is garbadge and the packet gets tossed. There is no way for an intermdiate router to figure out sender's adress at this point because the entire packet both the sender and recieves cannot be trusted. Hence packet is thrown out. As another commenter pointed out. TCP will retry based on the fact that it did not recieved (ACK).

Q2 (j) A device is sending out data at the rate of 1Mbps. How long does it takes to send out a single character (8bits)

Ans 1Mbps = 8000000 bits that means each second 8000000 bits are sent through the device so, time require to send 8 bits will be 8/8000000 = 0.0000001 second

Q2 (k) We have a channel with 4kHz bandwidth if we want to send data at 100kbps. what is the minimun SNR_{dB}. what is SNR?

Bandwidth = 4*103 and capicity = 100*103 we can find SNR_{db} and SNR by putting values in the formula,

Capacity = bandwidth * $\log_2(1+SNR)$ that means

Capacity / bondwidth

$= \log_2(1+SNR)\, 100*103/4*103$

$= \log_2(1+SNR)\, 25$

P.T.O

$= \log_2(1+SNR)225 = 1+SNR225-1$

$= SNR\ 33554432 - 1 = SNR\ 33,554,431$

$= SNR$ and $SNR_{bd} = 10\log 10(SNR)$

$SNR_{bd} = 10\log_{10}(33.554,431) \simeq 75dB$

SNR:-

SNR stand for signal to noise ratio, (SNR or S/N). It is a measure used in science and engineering that compresses the level of desired single to the level of background noise.

Q3 (L) The wave form here belongs to a Manchester encoded binary data stream. Determine the begining and end of bit period i.e (extract clock info)

Ans A manchester stream at the given wave form is a manchester binary data stream,

In manchester encoded binary stream, transition occour in the middle of each bit period. The middle transation in the data stream serves as a data bit and clock period.

Q3 (M) Assume that the priamary HDLC in NRM..... .....Assume error free operation

(A) Ans Because only one frame can be sent at a time and transmision must stop untill an acknowlegment is recieved, there is a little effecet in increasing the size of the message. If the frame size remain the e. All of this would affect the connect and disconnect time.

(B) Increasing the number of frames would decrease frame size. This would serve to lower link effiency. because the propagation time is unchange but [redacted] more acknowledgment would be needed.

(C) For a given, message size, increasing the frame size decreases the number of frames. This would serve to increase link effiency since propagation time is unchanged.