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BS (SE) 4th SECTION (B)

SUB: Computer Communication & Networks

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Question # 01

i) Which layers in the internet model are the network support layers.

ANSWER # 1

Transport layer has the network support layer and the user support layer. The transport layer is the layer in the open system interconnection (OSI) model responsible for end-to-end communication over a network.

ii) Names three types of transmission impairment?

ii) Answer :-

There are three types of transmission impairments: attenuation, delay distortion and noise. Attenuation the impairment is caused by the strength of signals that degrades with distance over a transmission link.

iii) what does the Shannon capacity have to do with communications?

iii) Answer :

Shannon information capacity  $C$  has long been used as a measure

of the goodness of electronic communications 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).

iv) compare and contrast flow control and error control.

iv) Answer:-

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.

v) Define piggybacking and usefulness.

v) Answer:-

"Piggybacking" is used to improve the efficiency of bidirectional transmission. When a frame is

is carrying data from A to B.

It can also carry control information about frames from B, when a frame is carrying data from B to A, it can also carry control information about frames from A.

vi) HDLC w.r.t station types transfer mode, frame types, supported and flag field purpose?

vii) Answer:-

It is a data link protocol, data is organized into frames..

HDLC supports two types of transfer modes, normal response mode...

Normal Response mode (NRM) -

here two types of stations are there, a primary station...

Flag - it is an 8-bit sequence that marks the beginning and the end of the frames.

vii) Name the protocol for noiseless channels?

Vii) Answer :-

GoP-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.

Viii) What is differential encoding? Also explain the difference b/w NRZ-L and NRZI and name the coding schemes of multilevel binary & bi-phase.

Viii) Ans: -

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... These symbols can be differentially encoded during the modulation process by assigning symbol table offset values associated with each data value.

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Difference b/w NRZ-L and NRZ-1 :-

Non-return-to-zero-Level (NRZ-L) 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 NRZ-L, NRZ-1 maintains a constant voltage pulse for the duration of a bit time this distinguishes NRZ-1 via NRZ-Level.

name the coding scheme of multi-binary & bi-phase :-

We can roughly divide line coding schemes into five categories:

Unipolar (e.g NRZ scheme).

polar (e.g NRZ-L)

NRZ-1, RZ and Biphasic multi-level. and multi-transition.

Question # 02 (a) :-

There are several network layer models proposed in the (OSI) model. Find all of them Explain the differences b/w them.

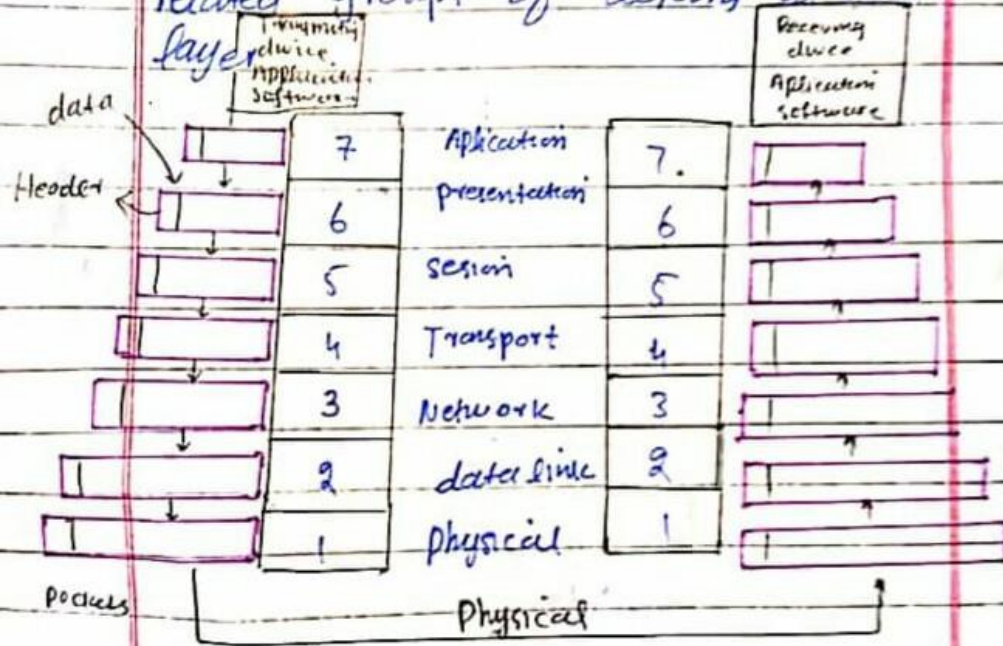
### ANSWER # 2 (a) :-

Whether it is wired or wireless, most data communications today happens by way of packets of information travelling over one or more networks. But before these networks can work together, though they must use a common protocol or a set of rules for transmitting and receiving these packets of data. Many protocols have been developed. One of the most widely used is the transmission control protocol / internet protocol (TCP/IP). Also a generic protocol model used in describing network communications known as the open system interconnection (OSI) model is useful for comparing and contrasting different protocols.

### The OSI Model :-

Designated ISO / IEC 7498-1, the OSI model is a standard of the international organization for standardization (ISO). It is

a general-purpose paradigm for discussing or describing how computers communicate with one another over a network. Its seven layered approach to data transmission divides the many operations up into specific related groups of actions at each layer.

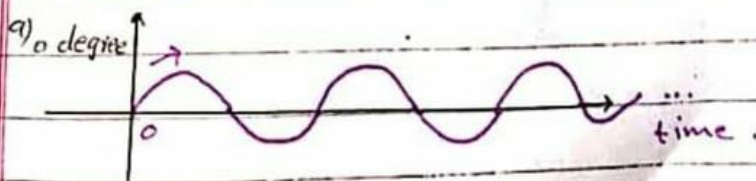


Part (b) :- Question # 2.

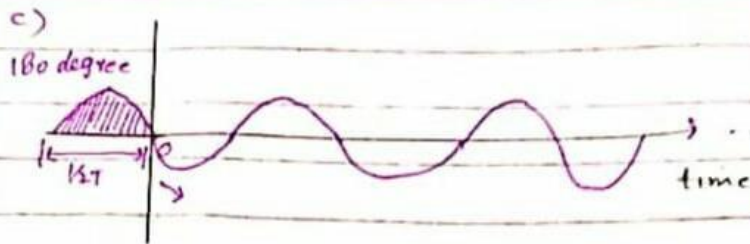
If a signal does not change at all, its frequency is zero. If a signal changes instantaneously, its frequency is infinite. Three components of a sine wave are amplitude, frequency and phase of a signal. The change in a signal shows the relationship b/w signal's amplitude w.r. to time whereas the phase is not shown. Explain your ans. Why are cannot explicitly shows phase in a time phase plot?

Answer # 2 # (b) :-

Phase describes the position of the phase waveform relative to time 0.







### Question # 03 (a):-

A device is sending out a data at the rate of 100 bps. How long does it take to send out a single character (8 bits)?

Ans # 03 (a):-

How long does it take to send out 100 bits -

$$100/100 = 1 \text{ sec.}$$

How long does it takes to send out single character of 8-bits.

$$8/100 = 0.008 \text{ sec.}$$

How long does it takes to send a file of 100,000 character.

As single character is of 8-bit.

$$(8 \times 100,000) / 2000 = 400 \text{ sec.}$$

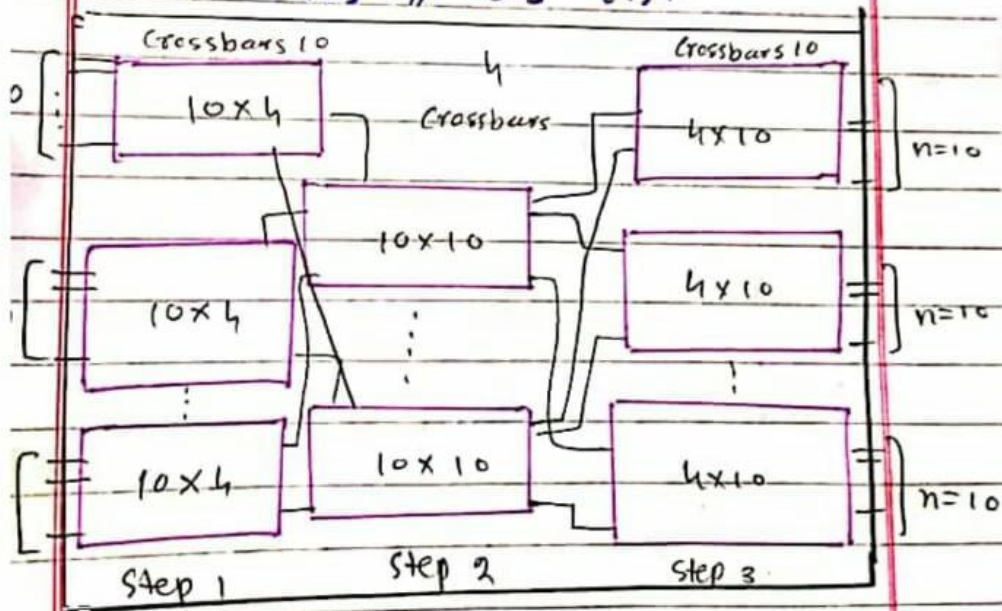
b): We need a Three-stage space-division switch with total

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inputs of 1000. We use 1000 cross bars at the first and third stages and 4 crossbars at the middle stage.

- Draw the configuration diagram.
- calculate the total number of cross-points.
- Find the possible number of simultaneous connections?

Ans # 03 (a):



a) The total number of cross points =  $10(10 \times 4) + 4(10 \times 10) + 10(4 \times 10)$   
 $= 1200$  c).

only four simultaneous connections

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are possible for each crossbar at the first stage.

b) this means that the total number of simultaneous connections is  $4 \times 10 = 40$ .

c) only four simultaneous connections are possible for each crossbar at the first stage. This means that the total number of simultaneous connections is  $4 \times 10 = 40$ .

d) if we use one crossbar ( $100 \times 100$ ), all input lines can have a connections at the same time, which means 100 simultaneous connections.

e) The blocking factor is  $40/100$  or 40 percent.

Thank you.

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