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BS (SE) 4th SECTION (B)

SUB: Computer Communication & Networks

SIR: MANSOOR QADIR

①

A) The open source interconnect (OSI) model is a conceptual framework that organizes the functional layers?

Answer:

→ The Data Link Layer is responsible for moving frames from one node (node) to the next.

→ Data Link Layer performs the most reliable node to node delivery of out data. It forms frames from the packet that are received from network layer and gives it to physical layer. It also synchronizes the information which is to be transmitted.

Function of Data Link Layer:

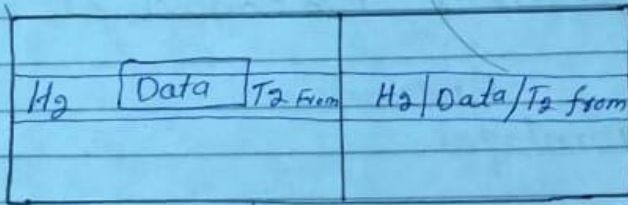
Framing:- Frames are the streams of bits received from the network layer into manageable data link units. This division of stream of bits is done by data link layer.

Physical addressing:- The Data link layer adds a header to the frames in order to define physical address of the sender or

②

## Receive of The Frame.

From the network layer To the Network Layer



Data Link layer To the positive Link layer From positive layer

### Design issues with Data Link Layer:

The issue that arises in the data link layer is how to keep a fast transmitter from drowning a slow receiver in data.

Broadcast network have an additional issue in the Data Link Layer. How to control access to the shared channels. A special sub layer of the data link layer the media access control (MAC)

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### Question(b)

(B) Argue the advantages and disadvantages of combining the sessions presentation?

### Answer:

#### Advantages:

- Single Layer to study as all the functionalities provided at this layer.
- Higher Bandwidth as number of layers is reduced.
- Mostly, it simplifies the conceptual problem of having to deal with those things in the network stack itself.
- The session and presentation layer use might pop up. But you should keep on it up.

#### Disadvantages:

- Make reasoning about the architecture of network systems less effective.
- There will be security issues as the network security and application.



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④

Security will open at a single point which may open our network open to our threat.

- It make troubleshooting hard as multiple errors may resides at single.
- it is very complex and the insitias implimentation of OST model is very complex and slow.

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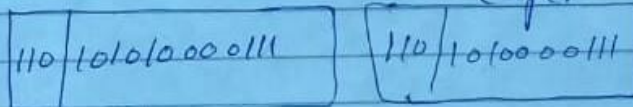
### Questions #2

1) There are several network layer models proposed in the OSI models. Find all of them?

#### Answer:

→ The seven layers are:  
**physical Layer:** The physical layer is responsible for movements of individual bits from one hop (node) to the next

From data link To data link  
Layer

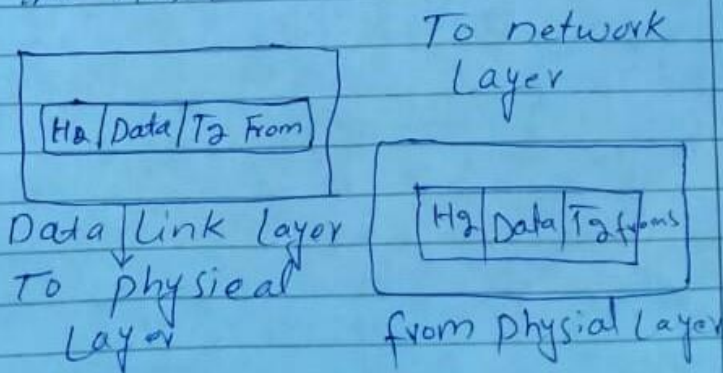


Physical layer      py layer

Transition

#### Data Link Layer

The data link layer is responsible for moving frames from one hop to the next

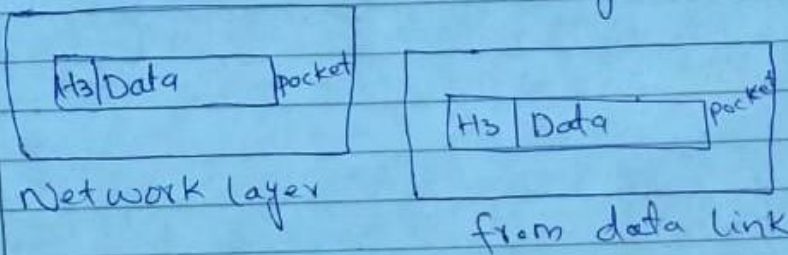


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### Network Layer:

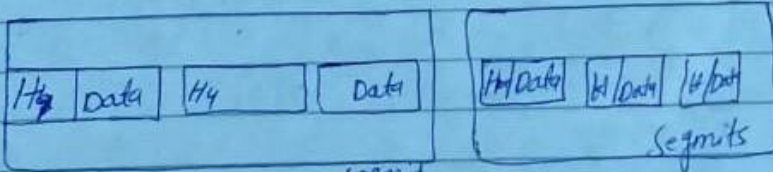
The network layer is responsible for the delivery of individual packets from the source host to the destination host.

From transport layer: To transport layer



### Transport layer:

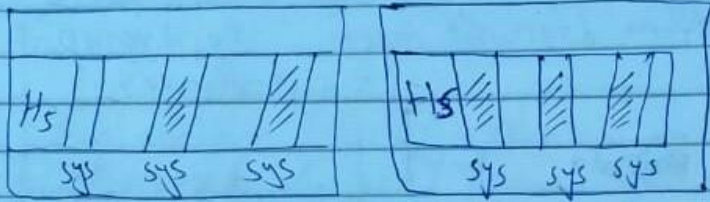
The transport layer is responsible for the delivery of a message from one process to another from session layer To session layer





Session Layer:-

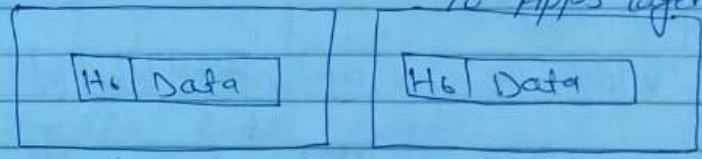
The Session Layer is Responsible for dialog control and synchronization from presentation layer



Session layer To transport layer From transport layer

Presentation Layer:

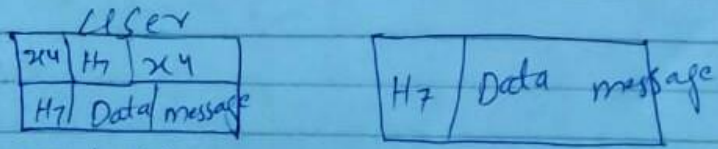
The presentation layer is Responsible for translation Compression and encryption from application layer



Presentation layer To session layer from session layer

Application Layer:

The Application Layer is Responsible for providing services to the user.



Apps Layer To presentation layer From presentation layer

Q.2b) If a signal does not change at all, its frequency is zero. If a signal changes instantaneously, its frequency is infinite. These are amplitude and phase.

Answer:

- Because two waves at different wavelengths and frequencies cannot be exact copies of each other differing only by a phase shift. However, it is possible for the sum of the two waves to be periodic. Then there will be an overall phase for the new periodic signal.
- ⇒ phase and frequency are not explicitly measured at a time duration.
- ⇒ A frequency domain plot shows the relationship between amplitude and frequency.



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A) Q No 3 (a)  
The duration of 1 bit before multiplexing.

The duration of 1 bit before multiplexing.  
Limit bit

individual connection = multiplexing

So,

$$= \frac{1}{10 \text{ Kbps}}$$

$$= \frac{1}{10,000 \text{ bps}} = \boxed{0.0001 \text{ s}}$$

$$\text{OR} = \boxed{1 \text{ ms}} \quad \text{Ans}$$

The duration of 1 bit for connection

$$= \frac{100 \text{ Kbps}}{100 \text{ Kbps}} \text{ as:}$$

$$= \frac{1 \text{ bit}}{100 \text{ Kbps}}$$

$$= \frac{1 \text{ bit}}{10,000 \text{ bps}} = \boxed{0.00001 \text{ s}} \quad \text{Ans}$$

The duration of 1 bit for connection 1 mbps as:

$$= \frac{1 \text{ bit}}{1 \text{ mbps}} = \frac{1}{1 \times 10^6 \text{ bps}}$$

$$= \frac{1 \text{ bit}}{1 \times 10^6 \text{ bps}} = 10^{-6} \text{ s}$$
$$\boxed{1 \mu\text{s}} \quad \text{Ans.}$$

(10)

The duration of 1 bit for connection  
10 mbps as:

$$= \frac{1 \text{ bit}}{10 \text{ mbps}}$$

$$= \frac{1}{1 \times 10^7 \text{ bps}}$$

$$= \frac{1}{1 \times 10^7 \cdot s} \quad \text{or} = \boxed{1 \times 10^{-7} \text{ s}} \quad \text{Ans.}$$

(b) The transmission rate of  
Link as:

The rate of the Link is 4-  
times the rate of a connection  
is 4 kbps.

(c) The duration of a time  
slot as:

The duration of each time  
slot is one-fourth of the  
duration of each bit before  
multiplexing.

or  $\frac{1}{4}$  ms or 250  $\mu$ s.

not  $\frac{1}{4}$  that we can also  
calculate this from the  
data rate of the Link  
4 kbps. the bit duration is  
the inverse of the data  
rate or  $\frac{1}{4}$  kbps or 250  $\mu$ s.

(d) The duration of a frame:

The duration of a frame is  
always the same as the  
duration of a unit before  
multiplexing.

II

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(11)

Or 1ms. we can also calculate this in another way. Each frame.

In this case has four time so slots. so the duration of a frame is 4 times or 1ms.





from the data rate of the link 4 Kbps. The bit duration is the inverse of the data rate or  $\frac{1}{4}$  Kbps or 250 u.s.

d) The duration of a frame:  
The duration of a frame is always the same as the duration of a unit before multiplexing. or 1ms. we can also calculate this in another way. Each frame in this case has four time slots, so the duration of a frame is 4 time 250 u.s. or 1ms.

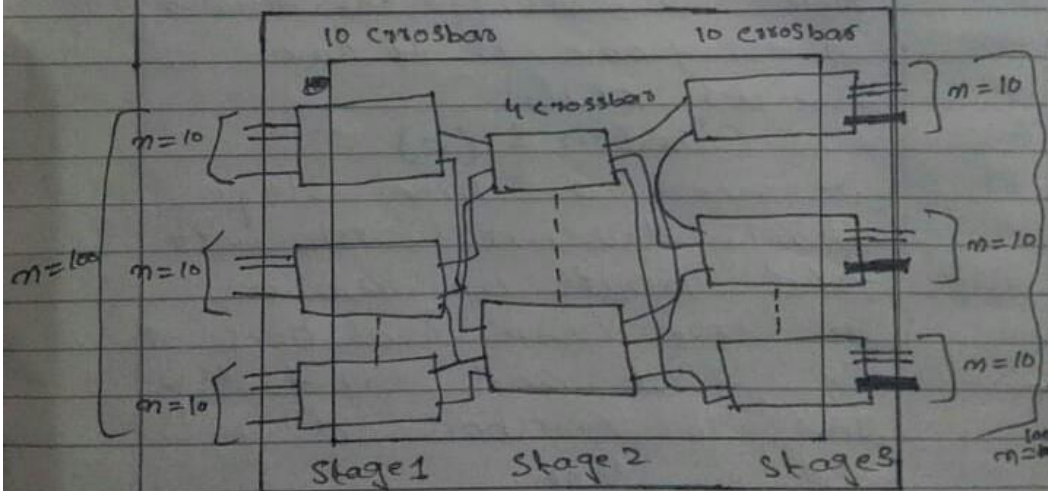
Question 3 (b)

we need a three-stage space division switch with total inputs of 10,000. we use 1000 crossbars at the first and third stages and 16 crossbars at the middle stage.

- a) Draw the configuration diagram.
- b) calculate the total number of crosspoints.

- (c) Find the possible number of simultaneous connections.
- (d) Find the possible number of simultaneous connection if we use one single crossbar (1000x1000).
- (e) Find the blocking factor and the ratio of the number of connection in (c) and in (d)

A3(b) Draw the configuration diagram:



(b) The total number of crosspoints  
 $= 10(10 \times 4) + 4(10 \times 10) + 10(4 \times 10)$   
 $1200$

(14)

2141

- (k) 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 connection at the same time which means 100 simultaneous connections
- (e) The blocking factor is  $40/100$  or 40 percent or 40%.

**END**