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Semester 4<sup>th</sup>

'Section - B'

(BS = SE)

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Question 1

part (a)

-> (Answer No : 1) <-

① Presentation layer.

The presentation layer is concerned with the syntax and semantics of the information exchanged between two systems.

② Transport Layer

The transport layer is responsible for process to process delivery of the entire msg. A process is an application program running on a host whereas the network layer oversees source to destination delivery of individual packets. it does not recognize any relationship between those packets.

It treats each one independently, as though each piece belonged to a separate msg. Whether or not it does. The Transport layer, on the other hand, ensures that the whole message arrives intact and in order, overseeing both error control and flow control at the source-to-destination level.

### Data Link Layer:

The data link layer transforms the physical layer a raw transmission facility to a reliable link. It makes the physical layer appear error-free to the upper layer. The data link layer is responsible for moving frames from one hop (node) to the next.





## Question 1 ("part B")

### Answer

The Advantages are:-

- a) Single layer to study as all the functionalities is provided at this layer:
- b) Higher Bandwidth as number of layers is reduced.
- c) It reflects the real-life separation of application from the TCP-downward section of the OSI model.

The Disadvantages are:

- a) Can make reasoning about the architecture of network system less effective.
- b) There will be security issues as the network security and application security will open at a single point which may expose our network open to our threat.
- c) It makes troubleshooting hard as multiple errors may reside at a single.



Question 2 → (Part a) ←

Answer 2 Physical Layer

The physical layer coordinate the function required to carry a bit stream over a physical medium. it deals with the mechanical and electrical specifications of the interface and transmission medium. it also defines the procedures and functions the physical devices and interfaces have to perform for transmission occur.

### Data Link Layer.

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## Transport Layer

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## Session Layer

The services provided by the first three layer (physical, data link, and network) are not sufficient for some process. The session layer is the network dialog controller. it establish, maintains, and synchronizes the interaction among communicating systems.

The session layer is responsible for dialog control and synchronization.

## Presentation Layer

The presentation layer is concerned with the syntax and semantics of the information exchanged between two systems.

The presentation layer is responsible for translation, compression, and encryption.

## Application Layer

The application layer enables the user, whether human or software, to access the network. It provides user interfaces and support for services such as electronic mail, remote file access and transfer, shared database management, and other type of distributed information services.

The application layer is responsible for providing services to the user.



Question 2 "Part B"Answer 2Signals

If the value of a signal changes over a very short span of time, its frequency is high. If it changes over a long span of time, its frequency is low.

If a signal does not change at all, its frequency is zero.

If a signal changes instantaneously, its frequency is infinity.

Phase:

The term phase describes the position of the waveform relative to time zero. If we think of the wave as something that can be shifted backward or forward along the time axis, phase describes the amount of that shift.

Phase describes the position of the waveform relative to time zero.

Question 3 part (a)

a) The duration of 1 bit before multiplexing.

Answers # 3 (a)

The duration of 1 bit as for 10 Kbps as follows.

$$= \frac{\text{Unit bit}}{\text{individual connection}} = \text{multiplexing!}$$

So

$$\frac{1}{10 \text{ Kbps}} = \frac{1}{10,000 \text{ bps}}$$

$$= \boxed{0.0001 \text{ s}} \quad \text{OR} \quad \boxed{1 \text{ ms}}$$

Ans

b) The duration of 1 bit for Connection 100 Kbps as:

$$= \frac{1 \text{ bits}}{100 \text{ Kbps}} = \frac{1 \text{ bit}}{100,000 \text{ bps}}$$

$$= \boxed{0.00001 \text{ s}} \quad \text{Ans}$$



The duration of 1 bit for  
connection 1 Mbps is:

$$= \frac{1 \text{ bit}}{1 \text{ Mbps}}$$

$$= \frac{1}{1 \times 10^6 \text{ bps}} = \frac{1}{10^6 \text{ bps}} = 10^{-6} \text{ s}$$

1  $\mu$ s Ans

The duration of 1 bit for  
connection 10 Mbps is:

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

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

100 ns Ans

(12)

(b) The transmission rate of link as:

The rate of the link is 4-times the rate of a connection or 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

Note 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. or 1 ms. we can also calculate this in another way. Each frame in this case has four time or slots.



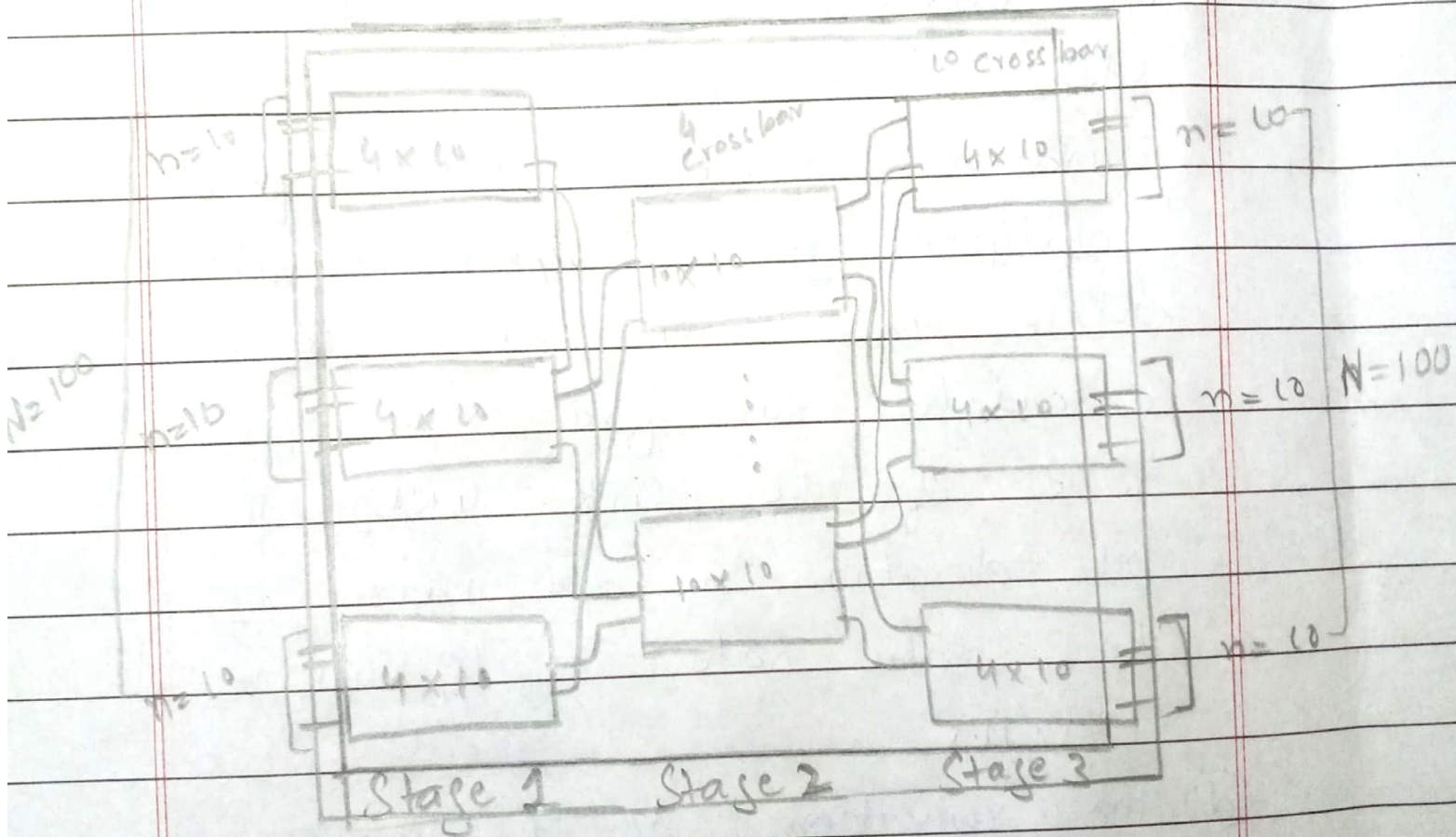
So the duration of a frame is 4-times slots or 1ms.



Question # 3

part - B

a) Draw the configuration diagram



b) The total number of crosspoints

$$= 10(10 \times 4) + 4(10 \times 10) + 10(4 \times 10)$$

$$= 1200$$

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

④

If we use one crossbar (100x100) all inputs lines can have a connections at the same time which means 100 simultaneous connections.

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The blocking factor is  
 $\frac{40}{100}$  or 40 percent  
or  
40%