

NAME :: MUHAMMAD USMAN Khan

ID No: 15038.

Section: A BS (SE) 4th

Semester :-

Q.1a) The open system Interconnect (OSI) model is a ²⁾ conceptual framework - - - - -
- - - - - then there is a case that OSI model was introduced by the international standard organization (ISO).

Answer ::

PDU stands for "Protocol data Unit" is a specific block of information transferred over a network. It is often used in reference to the OSI model since it describes the different types of data that are transferred from each layer. While the user data protocol uses diagrams as protocol data units for connectionless communication.

The feature of services of a network are related with a distinct layer.

Example 1. Physical layer, organizing the ones and zeros into chunks of data. Giving them safety place on the wire is done by the data network layer and sending the data to the right software application at the destination is done by the transport layer. The higher layer understand the structure of data in the (SDU) but the lower layer at the interface doesn't leads the SDU as payload, under taking it into same destination. In this way lower layer will add in SDU for certain data and to perform functions and it is called encapsulation.

3)
When the lower layer is added into SDU
a port number is given in which we
can easily identify the application,
a network address to help with
routing a code to identify the
type of data packet and error
checking information. All this information
are present in higher layers. So
in this way SDU and metadata
added by the lower layer can be
larger than the ~~minimum~~ ^{maximum} size of
that layer's PDU. If these layers
For example Transport layer, Presentation layer,
Data link layer and Physical layer.
are not able to work so
we are using the data with
much difficult way. The addition
of addressing and control

information to an (SDU) to form
a (PDU) and the passing of that
PDU to the next lower layer
as an SDU repeats until the
lowest layer is reached and
data passes over the same
medium as a physical signal.



5/4

Q1) Argue the advantages and disadvantages of combining the session, presentation and application layer in the OSI model into one single application layer in the internet model?

Answer:

The advantages and disadvantages of OSI layers are following:-

The Advantages are:-

- Single layer to study as all the functionalities is provided at this layer.
- Higher bandwidth as number of layers is reduced.
- It reflects the real-life separation of application from the TCP-downward sections of the OSI model.
- Layers in OSI architectures are distinguished according to the services interfaces and protocols.

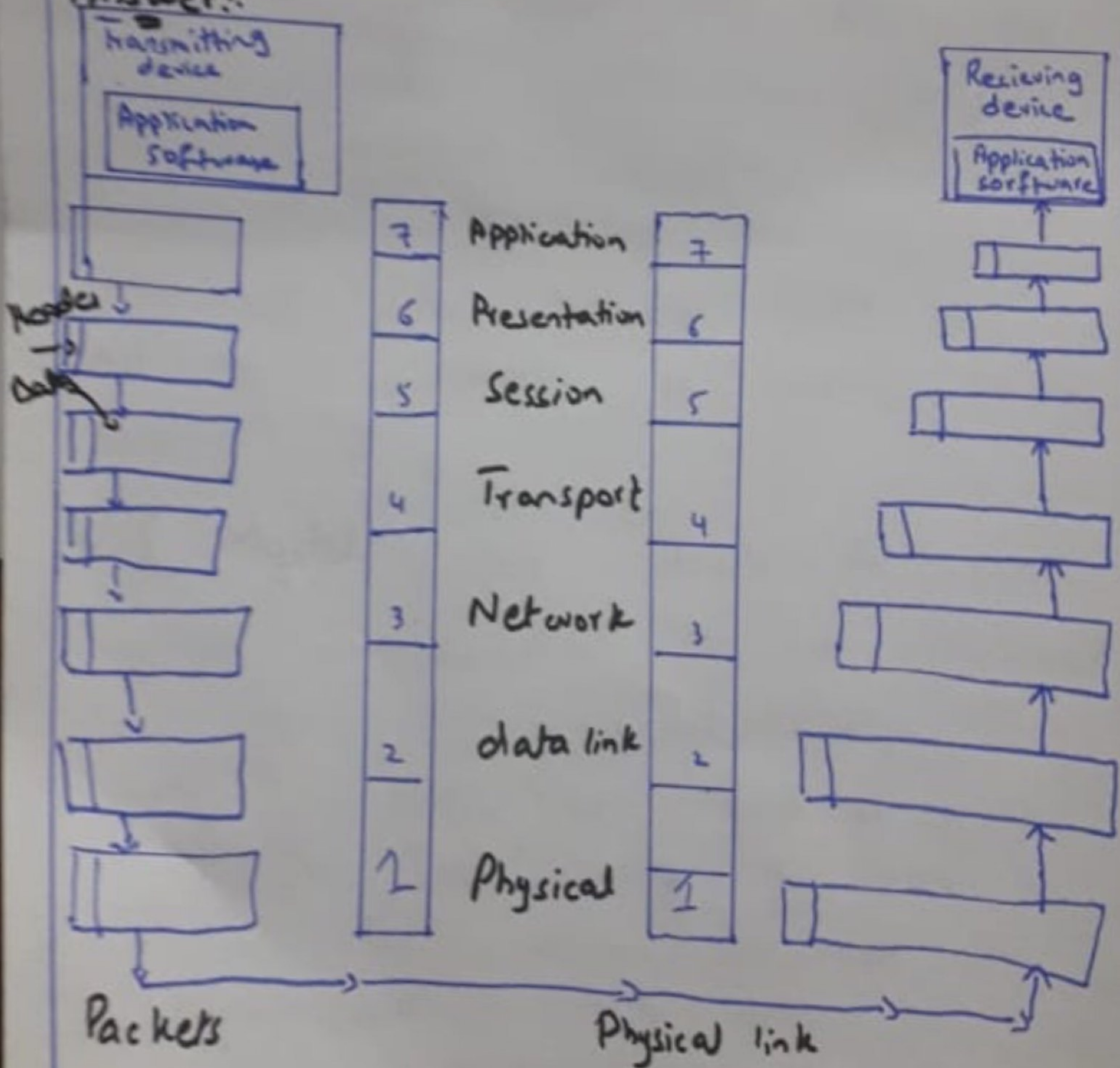
The Disadvantages are:

- Can make reasoning about the architecture of the network system less effective.
- 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.
- It makes troubleshooting hard as multiple errors may reside at a single.
- There is also interdependence among the layers. These layers cannot work in parallel. They have to be in wait to receive data from its predecessor.



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

Answer:



The transmitting computer software gives the data to be transmitted to the applications layer, where it is processed and passed from layer to layer down the stack with each layer performing its designation functions. The data is then transmitted over the physical layer of the network until the destination computer or another device receives it.

OSI Model: OSI stands for Open System Interconnection. It was established in 1947. OSI model help in many difficulties and it works in a faster way. It also helps in other computers to communicate with others. Its seven layered approach to data

transmission divides the many operations up into specific related groups of actions at each layer. There are seven layers which will be discussed below.

Application layer:

This layer works with the application software to provide communications functions as required. It verifies the availability of a communications partner and the resources to support any data transfer.

Presentation layer:

This layer checks the data to ensure that it is compatible with the communications resources. It ensures the compatibility between the data formats at the applications level and the lower levels. It also handles any needed data formatting or code conversion as well as data compression and encryption.

Session layer: software handles authentication and authorization functions. It also manages the connection between the two communicating devices, establishing a connection, maintaining the connection and ultimately terminating it. This layer verifies that the data is delivered as well. (10)

Transport layer: This layer provides quality of service functions and ensures the complete delivery of the data. The integrity of the data is guaranteed at this layer via error correction and similar functions.

Network layer: The network layer handles packet routing via logical addressing and switching functions.

Data link layer: operation package and uppack the data in frames.

11)

physical layer:- This layer defines the logical levels, data rate, physical media and data conversion functions that make up the bit stream of packets from one device to another.



8 Four connections (10 kbps, 100 kbps, 1 Mbps, 10 Mbps) are multiplexed - - - - -
- - - - - the duration of a frame.

Answer:

For 10 kbps channel:

a) duration of 1 bit = $\frac{1}{10 \text{ kbps}} = 10 \text{ ms}$

For 100 kbps channel:

a) duration of 1 bit = $\frac{1}{100 \text{ kbps}} = 100 \text{ ms}$

For 1 Mbps channel:

a) duration of 1 bit = $\frac{1}{1 \text{ Mbps}} = 1 \mu\text{s}$

For 10 Mbps channel:

a) duration of 1 bit = $\frac{1}{10 \text{ Mbps}} = 10 \mu\text{s}$

b) duration of 1 bit = $\frac{1}{10 \text{ Mbps}} = 10 \mu\text{s}$

b) Rate of link = 11 Mbps

c) The duration of each slot is the inverse of data rate

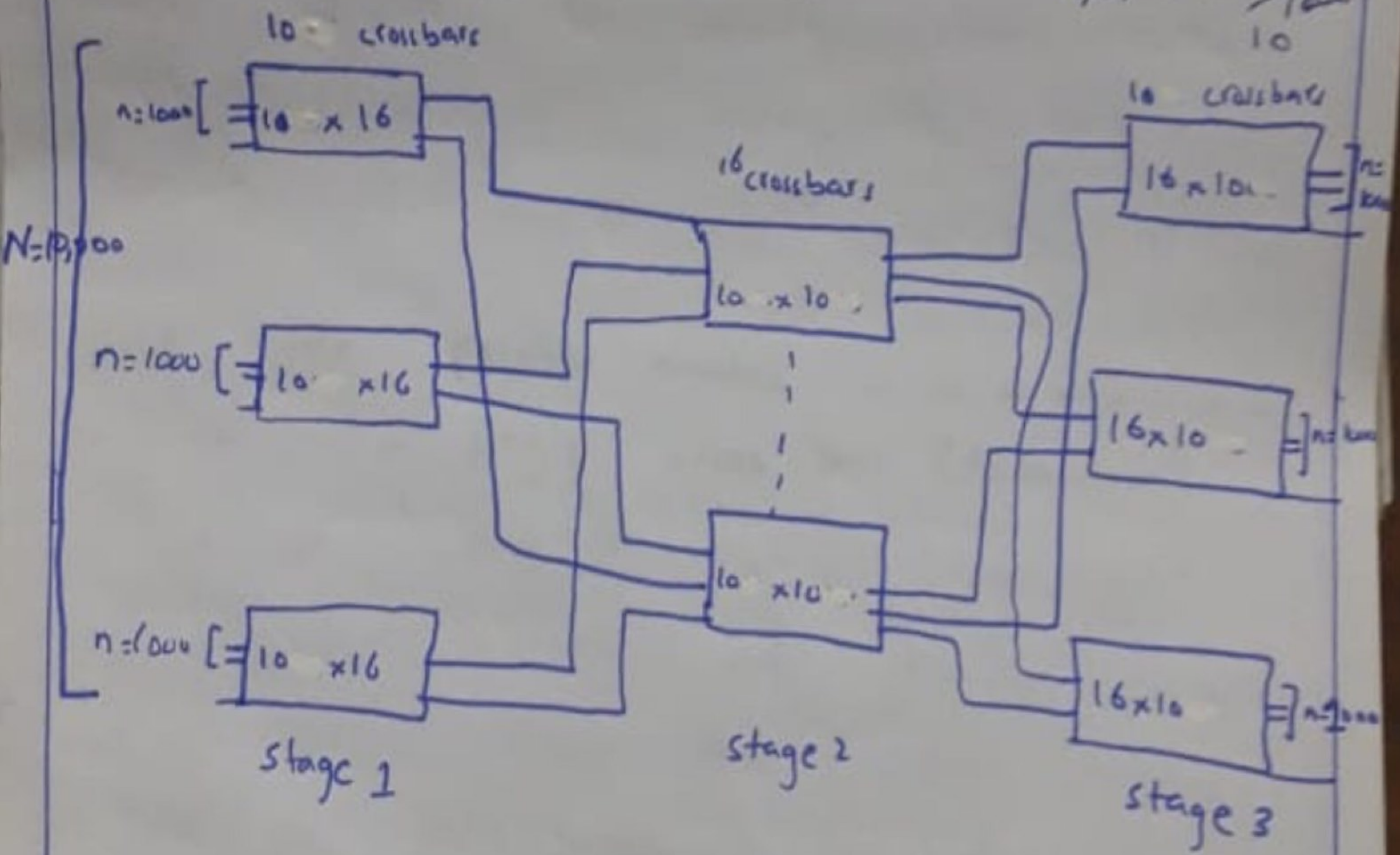
= $\frac{1}{11 \text{ Mbps}} = 0.09 \mu\text{s}$

d) Duration of frame is always same as the duration unit before multiplexing.

Q30) 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 crossbar at the middle stage?

a) Draw a configuration diagram.

$$N/n = \frac{10000}{1000} = 10$$



b) Calculate the total no of cross points.

Ans Number of crosspoints = $10 (10 \times 16) + 16 (10 \times 10) + 10 (16 \times 10)$

$$= 10 (1600) + 16 (1000) + 10 (1600)$$

$$= 16000 + 16000 + 16000$$

= 48 00

Ans.

151

c) Find the possible number of simultaneous connections;

Ans Only six possible simultaneous connections are possible for each crossbar at the first stage. This means that the total number of simultaneous connections is 160

D) Find the possible number - - - - -
- - - - - single cross bar (1000x1000).

We use one cross bar (1000x1000) all input lines can have a connection at the same time which means 1000 simultaneous connections.

e) Find the blocking factor?

Ans The blocking factor is $\frac{160}{1000} = 16\%$
Ans

←—————→