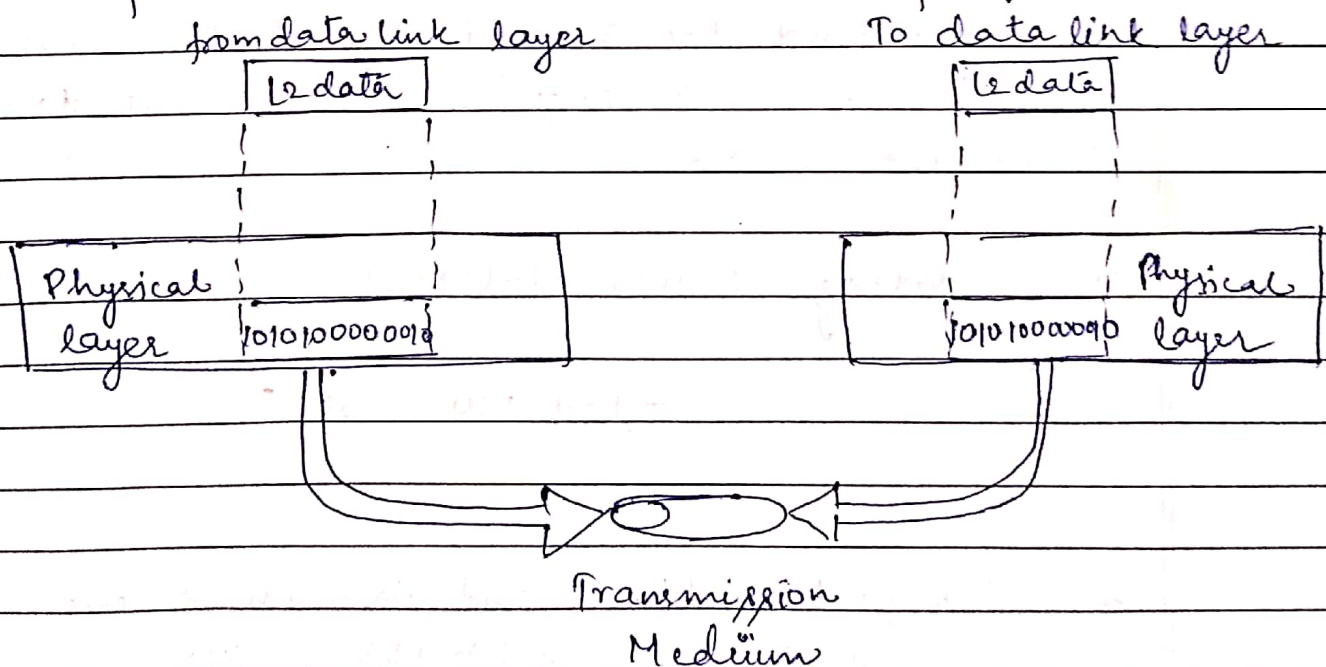


Computer NetworkMini-Test

There are seven OSI layers. Each layer has different functions.

(1) Physical layer :-

- The main functionality of physical layer is to transmit the individual bits from one node to another node.
- It establishes, maintains and deactivates the physical connection.
- It specifies the mechanical, electrical and procedural network interface specifications.



## (2) Data link layer :-

- This layer is responsible for error-free transfer of data frames.
- It provides a reliable & efficient communication between two or more devices.
- It is mainly responsible for unique identification of each device that resides on a local network.

The data link layer translates physical's raw bit stream into packets known as frames. It adds the header & trailer to the frame. The header which is added to the frame contains a hardware destination source address.

Header	Packet	Trailer
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## (3) Network layer :-

- It is a layer 3 that manages device addressing, tracks the location of devices on the network.
- It determines the best path to move data from source to destination based on network condition.
- An 'internetworking' is the main responsibility of Network layer.

## (4) Transport layer :-

- This layer ensures that messages are transmitted in the order in which they are sent and there is no duplicate of data.



- The main responsibility of transport layer is to transfer the data completely.
- It receives the data from upper layer and converts them into smaller units as segments.

#### (5) Session Layer

- The session layer is used to establish, maintain and synchronize the interaction between communicating devices.

#### (6) Presentation layer :-

- This layer is mainly concerned with the syntax and semantics of the information exchanged between the systems.
- It act as a data transfer for a network.

#### (7) Application layer :-

- This layer serves as a windows for users and application processes to access network services.
- It handle issues such as network transparency, resource allocation, etc.
- This layer provide network security for end users.

(Q.2) Circuit switching: It is a method that is used when a dedicated channel or circuit needs to be established. A channel used in circuit switching is kept reserved and applied only when two users need to communicate. Example: Telephone Network.

Packet switching: It is a method of grouping data that is transmitted over a digital network into packets. It is a connectionless network switching method. example: Ethernet, Internet Protocol, User Datagram Protocol.

Message switching: It is a connectionless network switching technique where the entire message is routed from the source node to the destination node.

example: Hop-by-hop Telex forwarding and UDP.

key difference :-

- In circuit switching method, message is received in the same order, that is sent from the source whereas, in packet switching method, messages are received out of order and are assembled at the destination.



(Q.3)

Connection-oriented

Connection-less

- |   |  |
|---|--|
| (1) It is related to the telephone system.            | (1) It is related to the postal system.            |
| (2) It is preferred by long and steady communication. | (2) It is preferred by bursty communication.       |
| (3) It is necessary.                                  | (3) It is not compulsory.                          |
| (4) It gives the guarantee of reliability.            | (4) It does not give the guarantee of reliability. |
| (5) It requires a bandwidth of high range.            | (5) It requires a bandwidth of low range.          |
| ex:- TCP<br>(Transmission Control Protocol)           | ex:- UDP<br>(User Datagram Protocol)               |

(Q.4)

A file of 64 GB

$$\text{Time needed} = \frac{\text{Throughput} \times \text{file size}}{\text{bandwidth}}$$

$$= \frac{1.8 \times 64000}{4}$$

$$= 28,800 \text{ sec}$$

$$= 480 \text{ min} = \boxed{8 \text{ hours}}$$