

Questions

- (Q) — Explain about broadcast protocols
1) a. what is LAN? what are the topologies of LAN? — (3)
- b. describe security threats along with its categories. — (5)
- c. How can you prevent security threats. — (6)
- (Q) — a. what is application layer. — (3)
- b. Differentiate between client-server and peer-to-peer network. — (5)
- c. Describe the communication method in Remote Procedure call. — (6)

3) a. what is Data Communication & computer

network and why do we need it? — (5)

b. classify computer networks and

describe each briefly — (5)

c. briefly discuss about Personal Area Network.

4) a. Describe and differentiate between

MAN and WAN — (7)

b. Why does DNS use UDP, not TCP. — (4)

c. Differentiate between the HTML

and HTTP. — (3)

- 5) a. Define Network Topology. Explain different network topologies — (6)
- b. How DHCP server assigns IP address to a host? — (5)
- c. Define FTP and its data structure. — (3)
- 6) a. Write down the layered architecture of Network Model.
- b. Show diagrammatic comparison of the TCP/IP and OSI model — (5)
- c. What are the differences between HTTP and HTTPS. — (3)

7) a. Describe OSI model. — (6)

b. Draw a diagram of sockets in client - server network. — (5)

c. Distinguish between physical and logical address. — (3)

8) a. Write down the TCP model for respective layers. — (5)

b. characteristics of TCP model. — (4)

9) Rewrite the basic principles of an autonomous system. — (5)

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Ans to the Q. No. 1(a)

LAN: Local Area Network (LAN) is a data communication network connecting various terminals or computers within a building or a limited geographical area. Example: Ethernet, Token Ring, wireless LAN using IEEE 802.11.

LAN has following topologies:

1. Star topology
2. Bus topology
3. Ring topology
4. Mesh topology
5. Hybrid topology
6. Tree topology



Ans do the Q. No. 1(b)

A security threat is an effort to obtain illegal admission to one's organization's network, to take one's data without their knowledge, or execute other malicious intent.

Security threats can be divided into

the following categories:

1. Interception: is a security threat in which availability of resources is attacked.

2. Privacy Breach: someone who is not the authorized person via accessing or intercepting data sent or received by the original authenticated user.

3. Integrity: includes any alteration or modification in the original context of communication.

4. Authenticity: This threat occurs when an attacker or a security violator, poses as a genuine person and accesses the resources or communicates with other genuine users.

Ans to the Q. No. 1(c)

To secure data the most widely used technique is cryptography. It is a technique to encrypt the plain-text data which makes it difficult to understand and interpret. The available cryptographic

algorithms are:

1. Secret key encryption: Both sender and

receiver have one secret key. This secret

key is used to encrypt the data

at sender's end. After the data is en-

closed, it is sent on the public domain

because the receiver knows

to the receiver. Because

the key, the encrypted data packets can

easily be decrypted.

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2. Public key encryption: Every user has

its own secret key and it is not in the

shared domain. Also every user has its

own public key. Public key is

always made public and is used by the

sender to encrypt the data. When

receivers do encrypted



the user receives, - the encrypted data, he can easily decrypt it by using its own secret key.

3. Message digest: Actual data is not sent, instead a hash value is calculated and send. The other end user computes its own hash value and compares with the one just received.

Ans do the Q. No. 2(a)

An Application layer is the top most layer in OSI and TCP/IP layered model. This layer exists in both layered models because of its significance, of which describes an

interaction with user and user applications. This layer is for applications which are involved in communication system. A user may or may not directly interact with the applications. Application layer is where the actual communication is initiated and reflected.

Ans do the Q. No. 2(b)

Difference between client-server and peer-to-peer network

client - server

- There is a specific client and server connected to the server.

Peer-to-Peer

- clients and servers are not distinguished; each node acts as client and server.

- | | |
|--|--|
| 2. Focus on sharing the information. | 2. focused on commer- |
| | tivity. |
| 3. The data is stored in a centralized server. | 3. Each peer has its own data. |
| 4. Client-server are expensive to implement. | a. Peer-to-peer are less expensive to implement. |
| 5. Client server is more stable and seable. | 5. Peer to peer suffers from increasing load if number of peers increases in the system. |

Ans to The Q. No. 2.(c)

This is a mechanism where one process interacts with another by means of procedure calls. This communication happens in the following way:

- The client processes calls the client stub. It passes all the parameters pertaining to program local to it.
- All parameters are then packed and passed to socket. A system call is made to send them to the other side of the network.
- Kernel sends the data over the network and the other end receives it.

- The remodel board passes data to the server stub where it is unmarshalled.
- The parameters are passed to the procedure and the procedure is then executed.
- The result is sent back to the client in the same manner.

Ans to the Q. No. 3(a)

Data communication refers to the transmission of digital data between two or more computers and a computer network or data in network via a telecommunication network that allows computers to exchange data.

The reasons we should learn this:

1. Network basic understanding:

A system of interconnected computers and computerized peripherals such as printers is called computer network. This interconnection among computers facilitates information sharing among them.

2. Network engineering:

To ease network engineering, the whole networking concept is divided into multiple layers. Each layer is involved in some particular task and is independent of all other layers. But as a whole almost all networking tasks depends on all of these layers.

3. Pondermed: kommer du hitta det

A network of networks is called an internetwork. It is the largest network in existence on this planet. It enables users to share and access enormous amount of information worldwide. It uses now, FTP, email services, audio, video streaming etc.

Ame do the S. No. 36)

How are computer networks classified based on various factors.

1. Geographical span:

1. Geographical ~~spurts~~ can be seen in
Geographically a meadow can be seen in
categories:

Geography
one of the following categories:

one of the following would prove
to be apportioned according to a whale

□ It may be opened
eaten - balloon - good in

- It may be spanned across multiple cities or provinces.
- It may be one network covering whole world.

2. Inter-connectivity:

Computers components of a network

can be connected to each other in some fashion:

- Every single device can be connected to every other device on network, making the network mesh.
- Each device is connected to its left and right peers only, creating linear structure.
- All devices connected together with

a single device, creating star like structure

3. Administration:

From an administrator's point of view, a network can be private network which belongs a single autonomous system and cannot be accessed outside either physical or logical domain.

4. Network-architecture:

Computer networks can be discriminated into various types such as client-server, peer-to-peer or hybrid depending upon their architecture.

Ans to the Q. No. 3(c)

A personal Area network (PAN) is a small local network which is very

personal to a user. This may include
bluetooth enabled devices or infra-red
enable devices. PAN has reconnection
range up to 10 meters. PAN may in-
clude wireless computer keyboard and
mouse, Bluetooth enabled headphones,
wireless printers and TV remotes.

Ans do the Q.No. 9(a)

Metropolitan Area Network (MAN) :

covers the largest size than LAN, such
as: small towns, city etc. MAN connects
2 or a lot of computers that area cover

apart however resides within the same
or completely different cities.

Wide Area Network (WAN):

WAN covers the largest area than MAN.

WHO covered such as - country / countries such as - used for WAN.

or radellite medium are
only boronate bases & esterates

Differences between MAN and WOMAN

MAN	PAN	WAN
1. MAN might not be owned by one organization.	1. WAN also might not be owned by one organization.	
2. There is moderate propagation delay in MAN.	2. There is long propagation delay in WAN.	
3. The transmission speed via fiber is low.	3. Transmission speed is low.	
4. Supports a bandwidth for transfer of low range of data.	4. Supports a bandwidth for transfer of low range of data.	
5. cost of installation is moderate.	5. cost of installation is higher than MAN.	

Ans do the Q. No. 4(b)

Ans do the Q. No. 4(b) ~~Ans do the Q. No. 4(b)~~
DNS uses UDP and not TCP because:

1. UDP is much faster. TCP is slow as it requires 3-way handshake. The load on DNS servers is also an important factor.

2. DNS servers (since they use UDP) don't have long living connections.

3. DNS servers are generally very small.

4. DNS servers store big segments, and files will collide with UDP segments.

5. UDP is not reliable but reliability can be added on application layer. An application can use UDP and add reliability by using a timeout and retransmit at the application layer.

The application layer can be implemented in various ways, e.g.,



Ans do the Q. No. 4(c)

Difference between HTML and HTTP:

HTML

1. It is a well-known markup language used of data communication for web page development the world wide web.

2. written using HTML 2. HTTP is the protocol elements which consist to exchange or transfer of tags primarily and far hyperlinked opening tag and a closing tag.

Ans do the Q. No. 5(a)

A network topology via the arrangement with which computer systems or network devices are connected to each other.

Different topologies are:

Point-to-point

It includes two nodes which are directly connected to each other or some other medium like satellite network. It is easy to implement and maintain.

Bus Topology:

It is a network type in which every computer and network is connected to single cable. It transmits data only in one direction.

Star topology:

All the computers are connected to a single hub through a cable. This hub is the central node and all other nodes are connected to the central node.

Tree topology:

It has a root node and all other nodes are connected to it forming a hierarchy.
It should at least have three levels to the hierarchy.

Hybrid topology:

It is a mixture of two or more which are in a mixture of two or more topologies.

Topologies:

Ans for Q. No. 5(b)

DHCP server assigns IP address to a host and

DHCP DISCOVER: When a new node connected to the network it broadcasts the above board message

the DHCPOFFER message which contains the source address as 0.0.0.0 to every node on the network including server. Upon receiving the message, DHCP server performs the procedure the DHCPOFFER message to the requested host which contains the requested address and new IP address assigned by the server. This is sent to the host to the node.

□ DHCPOFFER : If there are multiple servers on the network, host receiver receives multiple DHCPOFFER message. It is upto the host to select a particular message.

□ DHCPREQUEST : The requested host on receiving the offer message, it again broadcasts the DHCPREQUEST



message on the network with the address of the server whose offer message is accepted by the host.

DHCPRELEASE: Finally, if the host wants to move to other network or it sends DHCPRELEASE message packed to the server indicating that it wants to disconnect.

Ans do the Q. No. 5(c)

File transfer protocol (FTP) via an application layer protocol which moves files between local and remote file systems. FTP follows three types of data-structure:
1. file-structure: On the file-structure

there is no internal structure and the file is considered to be continuous sequence of data bytes.

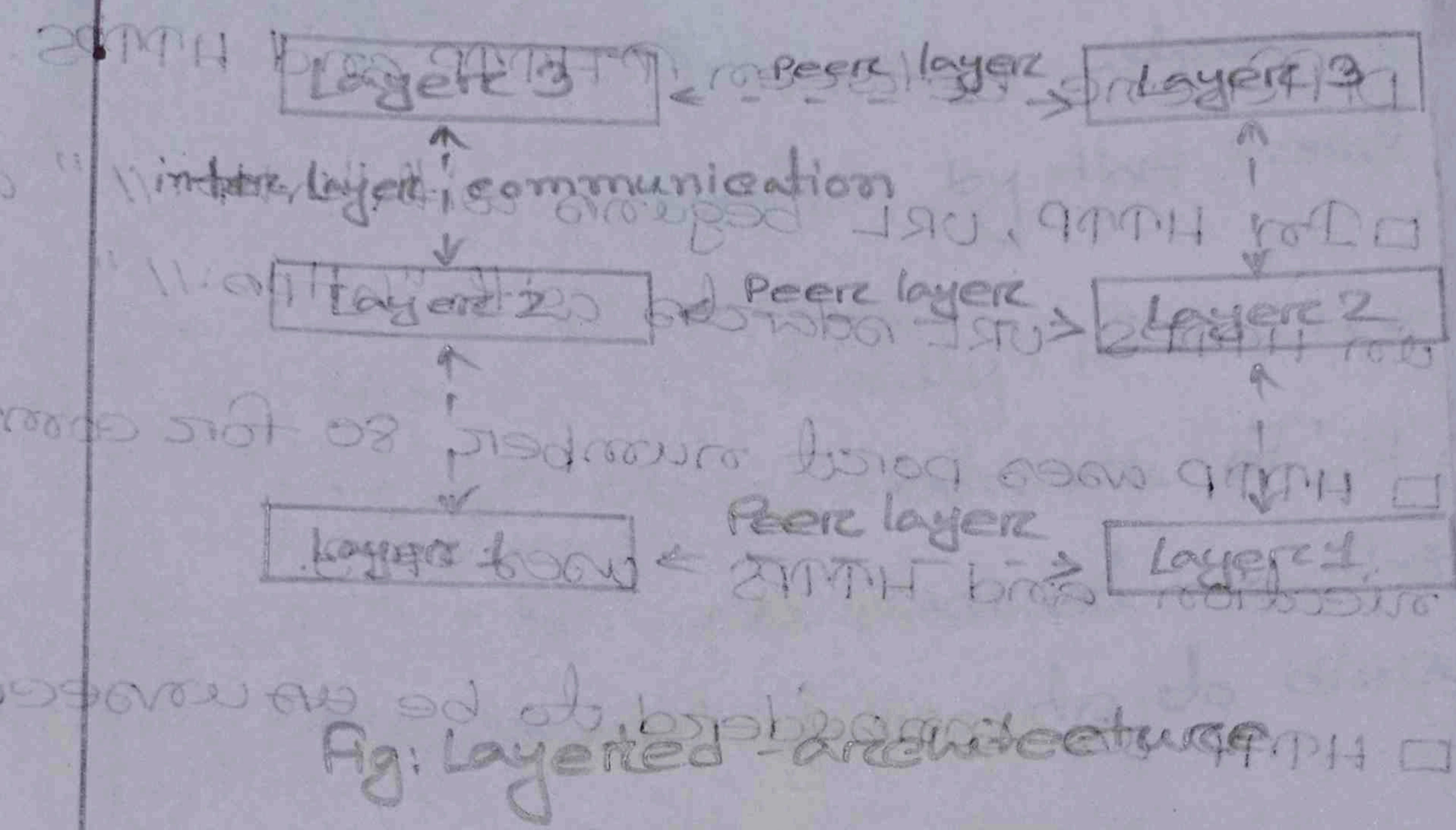
2. Record structure: In record structure the file is made up of sequential records.

3. Page-structure: In page-structure the file is made up of independent index pages.

(Q) Ans to the Q. No. 6(a)

In layered architecture of network model one whole network process is divided into small tasks. Each small task is then assigned to a particular layer which works dedicatedly to process the task only. Every layer does only one task.

a specific attack on them



Ans do the Q. No. 6 (b)

The diagram comparison of TCP/IP and OSI

TCP/IP model
Application layer
Transport layer
Internet layer
Network Access layer

OSI Model
Application layer
Presentation layer
Session layer
Transport layer
Network layer
Data Link layer
Physical layer

Ans to the Q. No. 6 (c)

Difference between HTTP and HTTPS.

- In HTTP, URL begins with "http://" whereas in HTTPS URL starts with "https://"
- HTTP uses port number 80 for communication and HTTPS uses 443.
- HTTP is considered to be less secure and HTTPS are secure.

Ans to the Q. No. 7 (a)

Open system interconnection (OSI) is an open standard for all communication system. OSI model is established by international standard organization (ISO).

This model has seven layers:

1. Application layer: This layer is responsible for providing interface to the application user.

2. Presentation layer: Defines how data in the native format of remote host should be presented in the native format of host.

3. Session layer: Maintains sessions between remote hosts.

4. Transport Layer: Responsible for end-to-end delivery between hosts.

5. Network Layer: responsible for address assignment and uniquely addressing nodes on a network.

6. Data Link Layer: responsible for reading and writing data from and onto the disk.

7. Physical Layer: defines the hardware, cabling, wiring, power output, pulse rate.

Ans do the Q. No. 7(b)

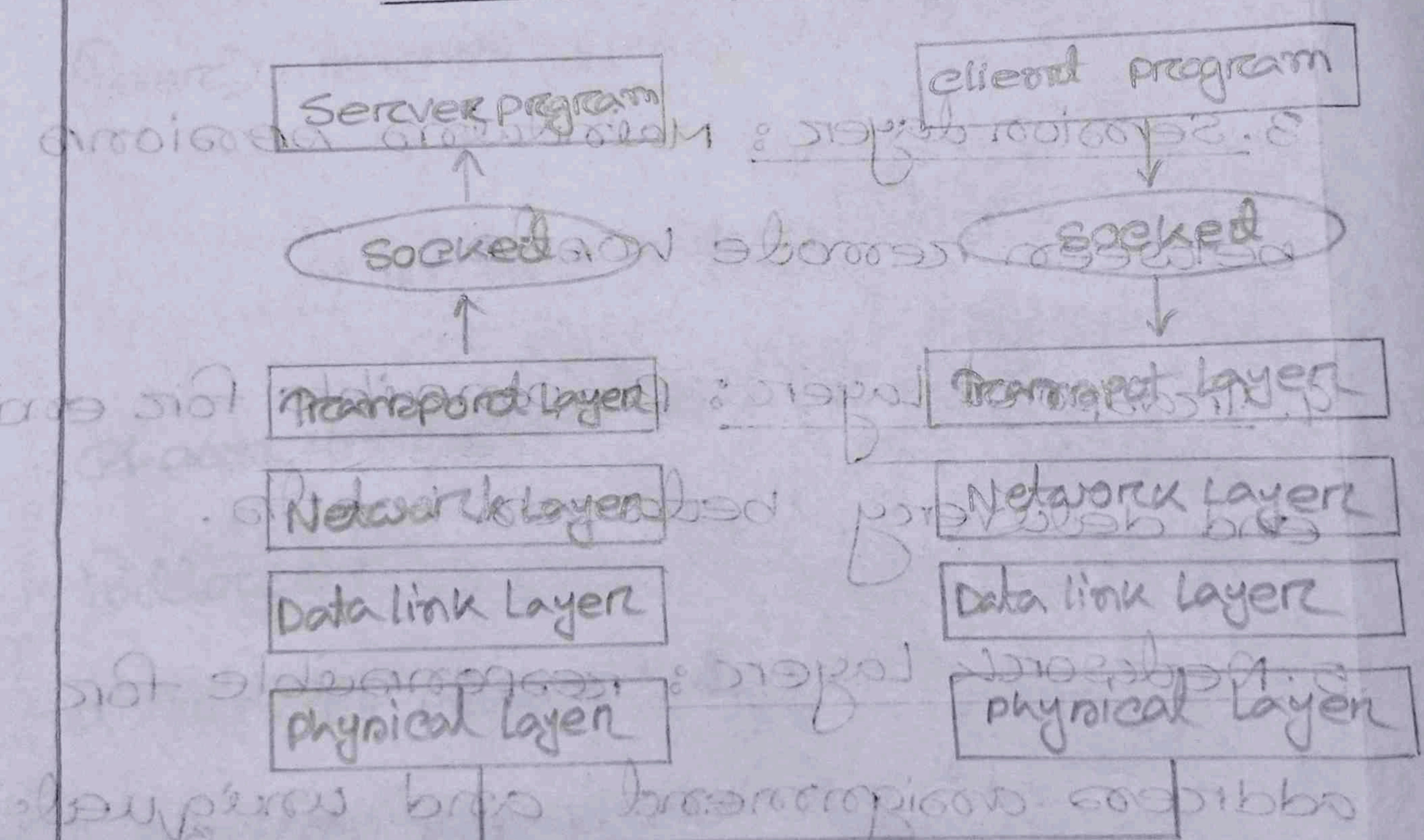


Fig: Sockeds in client-server network

Ama do the Q. No. 7(c)

Difference between physical and logical address:

Logical address

Physical address.

- | | |
|--|------------------------------------|
| 1. User can view the logical address of program. | Physical address of program. |
| 2. Generated by ePU. | 2. Location in a memory unit |
| 3. The user can use logical address to access indirectly the physical address. | 3. User can only physical address. |

Ama do the Q. No. 8(a)

TCP/IP model:

- Application layer: HTTP, FTP, Telnet, SMTP, DNS, BGP, DHCP



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- Transport Layer: TCP, UDP
- Internet Layer: IP
- Network Interface Layer: CSMA/CD, HDLC, LAP-B, LAP-D
- Media/Hardware layer: Ethernet (twisted pair, broadband coaxial, optical fiber), radio, infrared etc.

Ans do the Q. No. 8(b)

Characteristics of PPP modulated wave follows:

- a. PPP has 4 Layers
- b. PPP is more reliable
- c. PPP uses both session and

and presentation layers in the application layer instead.

- d. TCP/IP follows a horizontal approach
- e. TCP/IP does not have very strict boundaries.

Ans to the Q. No. 8(c)

End-to-End principle:

- Final decision should always be made by the users.
- Trying to complement these decisions by ~~intelligence~~ inside the network is redundant.
- Control functions should thus be delegated as much as possible outside the network.
- In other words, the network does

the routine and the end-system does the control.

IP over everything:

- Bordernet is built by layering a unique 'Interconnecting protocol' on top of various network technologies.
- Consequence: very simple to adopt new technologies in the internet.
- Another advantage: world-wide addressing