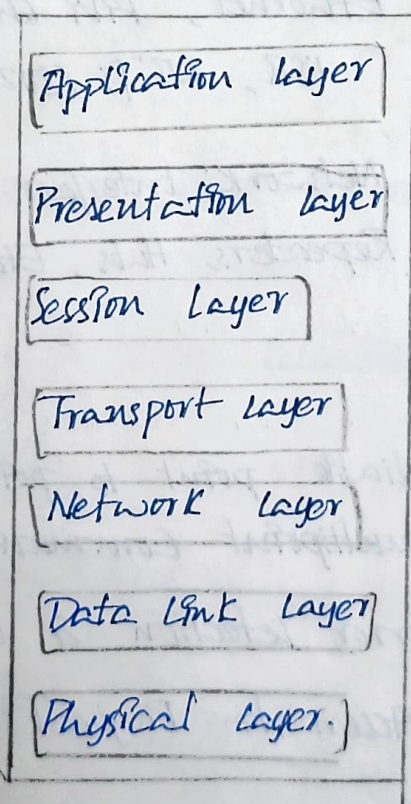Internetworks Protocols.

Assignment - 1

1. OSI - Protocol Stack:

Open Systems Interconnection (OSI) model is a conceptual framework that standardizes the function of telecommunication into seven layers. &

Each layer serving a diffrent purpose and interacts with adjacent Layers.

Application Layer
Presentation Layer
Session Layer
Transport Layer
Network Layer
Data Link Layer
Physical Layer.

OSI Model.

By Chaining together all these layers passes data and Protocols, Complex data communications can be sent from one high level application to another.

Roles of Each layer:

1. Physical Layer:
   → Responsible for the Physical Connection between Devices. ~~across a med~~
   → Defines Hardware Characteristics of transmission medium

   Protocols used: Ethernet, Fibre channel, USB, WiFi (802.11)

   Devices used: Network Interface Cards (NIC), Repeaters, Hubs, Ethernet Cables

2. Data Link Layer:
   → Ensures Reliable point to point and point to multipoint Communication
   → Provides Error Detection & Correction
   → Manages Access to Physical Medium.

   Protocols used: Point-to-~~Protocol~~ Point Protocol (PPP), Asynchronous transfer mode (ATM), High-level Data Link Control (HDLC)

Devices used: Switches, Bridges

3. Network Layer:
→ Responsible for Routing Packets from Source to Destination

→ Handles Logical Addressing and traffic Managment.

Protocols used: Internet Protocol (IP),

Internet Control Message Protocol (ICMP)

Internet Group Managment. Protocol. (IGMP)

Routing Information Protocol (RIP)....

Devices used: Routers, Layer3 Switches.

4. Transport Layer:
→ Provides end-to-end Communication between Devices

→ Ensures Data Reliability & Integrity

Protocols used. TCP, UDP, Stream TCP SE (SCTP)

Devices used: Gateways, Firewalls.

5. Session Layer:
→ Establishes, maintains, and terminates Connection between Devices

→ Synchronizes Data Exchange.

Protocols used: Net BIOS, Remote Procedure Call (RPC),

Session Initiation Protocol (SIP)

~~Devices used~~

6. Presentation layer:

→ Translates, encrypts, compress data for transmission

→ Ensures Data is in Readable format at Application layer

Protocols used: ~~Session~~ Secure Socket Layer (SSL)

Transport layer Security (TLS)

~~ASCII~~

3. Application layer:

→ Provides user Interfaces & Network Services.

→ Support Communication between application.

Protocols used: Hypertext Transfer Protocol (HTTP)

File Transfer Protocol (FTP)

Domain Name system (DNS)

(IMAP)

Devices: Servers, Clients.

In the OSI model the distinction between
*Same Network & Different Network type refers
to the Network Layer 4 how idle is routed
b/w devices

Same Network:

When two devices are on Same network, they
can communicate directly without the need
for routing.

The Network Layer address used for Communication
are typically with the same Subnet.

Data is usually sent using MAC Addresses at
the Data Link (Layer2) within the local network
Segment

Different - Network:

When too devices are on different networks,
data needs to be routed b/w networks to
reach its destination.

It uses routers to forward the data.
Data is sent using MAC addresses within the
local Network segment but - uses IP addresses

	Same Network	Different Network
Physical Layer	Ethernet cables	Modem, Routers. Protocol: DSL, Fiber
Data Link Layer	MAC Address Protocol: Ethernet	MAC address, routers, Protocol: Ethernet.
Network Layer	IP address Protocol: IPv_4, IPv_6	IP address, routers. Protocol: IPv_4 or IPv_6 OSPF, BGP.
Transport Layer	TCP/UDP Protocols: TCP, UDP	TCP/UDP
Session Layer	Not Applicable ~~TCP~~	Not Applicable
Presentation Layer	Not Applicable	Not Applicable.
Application Layer	Communicate Directly	Communicate across Network