**PRACTICAL-1**

**Layers in OSI MODEL:**

* **Physical Layer**
* **Datalink Layer**
* **Network Layer**
* **Transport Layer**
* **Session Layer**
* **Presentation Layer**
* **Application Layer**

**PHYSICAL LAYER:**

* **Overview:**
* The lowest layer of OSI reference model
* It is responsible for actual physical connection between devices
* It contains information in form of bits
* It is responsible for transmitting individual bits from one node to next
* **Functions:**
* Bit synchronization
* Bit rate control
* Physical topologies
* Transmission mode
* **Devices:**
* Hub
* Repeater
* Modem
* **Protocols used:**
* Ethernet

**Datalink Layer:**

* **Overview:**
* it is responsible for node to node delivery of the message
* it ensures that data transfer is error-free
* When packet arrives in a network datalink layer transmit it to Host using MAC address
* The packet received from network layer is further divided into frames depending on the frame size of NIC
* **Functions:**
* Framing
* Physical addressing
* Error control
* Flow control
* Access control
* **Devices:**
* Switch
* Bridge
* **Protocol Used:**
* Ethernet

**Network Layer:**

* **Overview:**
* Network layer works for the transmission of data from one host to the other located in different networks
* takes care of packet routing i.e. selection of the shortest path to transmit the packet, from the number of routes available
* The sender & receiver’s IP address are placed in the header by the network layer.
* **Functions:**
* Routing
* Logical Addressing
* **Devices:**
* Routers
* **Protocols Used:**
* IP(Internet Protocol)

**Transport Layer:**

* **Overview:**
* Transport layer provides services to application layer and takes services from network layer.
* The data in the transport layer is referred to as *Segments*.
* responsible for the End to End Delivery of the complete message
* also provides the acknowledgement of the successful data transmission and re-transmits the data if an error is found.
* **Functions:**
* Segmentation
* Reassembly
* Service Point Addressing
* **Devices:**
* Gateways
* Firewall
* **Protocols Used:**
* TCP(Transmission Control Protocol)

**Session Layer:**

* **Overview:**
* responsible for establishment of connection, maintenance of sessions, authentication and also ensures security
* **Function:**
* Session establishment
* maintenance
* termination
* Synchronization
* **Devices:**
* Gateways
* Firewall
* PCs/Devices

**Presentation Layer:**

* **Overview:**
* also called the Translation layer.
* The data from the application layer is extracted here and manipulated as per the required format to transmit over the network.
* **Functions:**
* Translation
* Encryption
* Decryption
* Compression
* **Devices:**
* Gateways
* Firewalls
* PC’s.

**Application Layer:**

* **Overview:**
* implemented by the network applications
* These applications produce the data, which has to be transferred over the network.
* serves as a window for the application services to access the network and for displaying the received information to the user.
* **Functions:**
* Network Virtual Terminal
* FTAM-File transfer access and management
* Mail Services
* Directory Services
* **Devices:**
* Gateways
* Firewalls
* all end devices like PC’s, Phones, Servers
* **Protocols Used:**
* HTTP
* FTP
* DNS
* TELNET