NETWORK LAB VIVA QUESTIONS

Difference of TCP/IP and OSI model

TCP/IP	OSI
Implementation of OSI model	Reference model
Model around which Internet is developed	This is a theoretical model
Has only 4 layers	Has 7 layers
Considered more reliable	Considered a reference tool
Protocols are not strictly defined	Stricter boundaries for the protocols
Horizontal approach	Vertical approach
Combines the session and presentation layer in the application layer	Has separate session and presentation layer
Protocols were developed first and then the model was developed	Model was developed before the development of protocols
Supports only connectionless communication in the network layer	Supports connectionless and connection-oriented communication in the network layer
Protocol dependent standard	Protocol independent standard InstrumentationTools.com

LAYER OF OSI MODEL AND ITS FUNCTION

1. **Physical Layer:** Deals with the physical connection and transmission of raw bits over a physical medium.
2. **Data Link Layer:** Responsible for framing, error detection, and MAC (Media Access Control) addressing to facilitate reliable communication within the same network.
3. **Network Layer:** Manages logical addressing, routing, and packet forwarding to enable communication between different networks.
4. **Transport Layer:** Ensures end-to-end communication reliability, flow control, and error correction between devices across networks.
5. **Session Layer:** Establishes, maintains, and terminates sessions (connections) between applications, allowing them to communicate.
6. **Presentation Layer:** Translates data between the application layer and the lower layers, ensuring compatibility by handling data format and encryption/decryption.
7. **Application Layer:** Provides network services directly to end-users and applications, offering functions like file transfer, email, and remote login.

DEVICES IN DIFFERENT LAYERS

OSI Layer	Devices
Physical Layer	Hubs, Repeaters, Cables, Connectors
Data Link Layer	Bridges, Switches, NIC (Network Interface Card)
Network Layer	Routers, Layer 3 Switches, IP Cameras
Transport Layer	Gateways, Firewalls, Load Balancers
Session Layer	Not typically associated with specific devices
Presentation Layer	Not typically associated with specific devices
Application Layer	End-user Devices (Computers, Smartphones), Servers

LAYER OF TCP/IP AND ITS FUNCTION

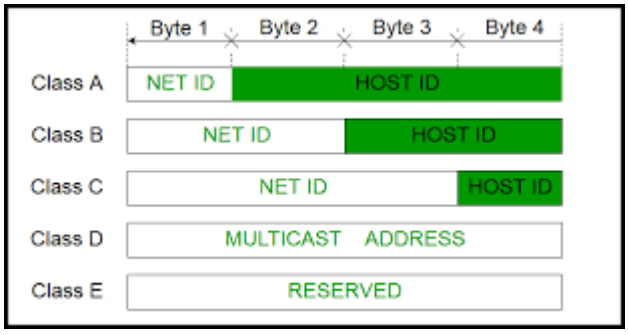
1. **Link Layer (or Network Interface Layer):**
    - **Function:** Responsible for the physical connection between devices on the same network.
    - **Devices:** Ethernet cards, Wi-Fi adapters, Network switches.
2. **Internet Layer:**
    - **Function:** Handles logical addressing, routing, and packet forwarding between different networks.
    - **Devices:** Routers, Layer 3 switches.
3. **Transport Layer:**
    - **Function:** Ensures end-to-end communication reliability, flow control, and error correction between devices across networks.
    - **Protocols:** Transmission Control Protocol (TCP), User Datagram Protocol (UDP).
4. **Application Layer:**
    - **Function:** Provides network services directly to end-users and applications, supporting functions like file transfer, email, and remote login.
    - **Protocols:** Hypertext Transfer Protocol (HTTP), File Transfer Protocol (FTP), Simple Mail Transfer Protocol (SMTP).

ARP (Address Resolution Protocol): Resolves an IP address to its corresponding MAC address on a local network.

RARP (Reverse Address Resolution Protocol): Resolves a MAC address to its corresponding IP address.

DNS (Domain Name System): Translates human-readable domain names into IP addresses, facilitating internet communication.

IPV4 classes



Class	1st octet of IP address	Default Subnet Mask	Network / Host	Number of networks	Maximum nodes in a network
A	1 - 126	255.0.0.0	N.H.H.H	126	16,777,214
B	128 - 191	255.255.0.0	N.N.H.H	16,384	65,534
C	192 - 223	255.255.255.0	N.N.N.H	2,097,152	254
D	224 - 239				
E	240 - 254				

PRIVATE IP ADDRESS

	Private address range	
Class	start address	finish address
A	10.0.0.0	10.255.255.255
B	172.16.0.0	172.31.255.255
C	192.168.0.0	192.168.255.255

	Public address range	
Class	start address	finish address
A	0.0.0.0	126.255.255.255
B	128.0.0.0	191.255.255.255
C	192.0.0.0	223.255.255.255
D	224.0.0.0	239.255.255.255
E	240.0.0.0	254.255.255.255

DIFFERENCE BETWEEN IPV4 AND IPV6