Q1. What are the principles behind OSI model.

The OSI (Open Systems Interconnection) model was developed based on several key principles designed to guide the design and implementation of network protocols. Here are the core principles behind the OSI model:

1) Layered Architecture: Seven distinct layers for modularity and interoperability.

2) Standardization: Open standards and protocol independence.

3) Abstraction: Each layer focuses on specific functions, hiding details from others.

4) Layer Functions: Defined roles for each layer with clear interactions.

5) Flexibility and Scalability: Adaptable and scalable network framework.

6) Error Handling: Mechanisms for error detection and correction.

7) End-to-End Communication: Ensures transparent data handling and integrity.

8) Network Management: Simplifies troubleshooting, maintenance, and upgrades.

Q2. What are the seven layers of OSI models? What is the function of each layer.

The seven layers of the OSI model along with their functions:

1) Physical Layer:

Function: Transmits raw bit streams over a physical medium (cables, switches).

2) Data Link Layer:

Function: Ensures reliable node-to-node data transfer, error detection, and correction (MAC addresses).

3) Network Layer:

Function: Manages logical addressing and routing of data packets across the network (IP addresses).

4) Transport Layer:

Function: Provides reliable data transfer, flow control, and error recovery (TCP/UDP).

5) Session Layer:

Function: Manages sessions and controls dialogues between computers (establish, manage, and terminate connections).

6) Presentation Layer:

Function: Translates data between the application layer and the network, handling data encryption and compression.

7) Application Layer:

Function: Provides network services directly to end-user applications (HTTP, FTP, SMTP).

These layers work together to ensure effective and reliable communication across networks.

Q3. Difference between OSI model and TCP/IP model.

Here is difference between OSI model and TCP/IP model:

OSI model	TCP/IP model
OSI (Open System Interconnection) model is developed by ISO in late 1970s.	TCP/IP (Transmission Control Protocol / Internet Protocol) model is developed by U.S. Department of Defense in 1960s-70s.
Purpose is theoretical framework for network design.	Purpose is practical model for Internet and networking.
Network layer of OSI model provides both connections oriented and connectionless service.	The network layer in TCP/IP model provides connectionless service.
It is protocol independent.	It is protocol dependent.
It has 7 layers.	It has 4 layers.
It is mainly used for teaching and conceptual understanding.	It is widely implemented, basis of the internet.

Q4. Difference between Client-Server network and Peer-Peer network.

Here is difference between Client-Server network and Peer-Peer network:

Client-Server network	Peer-Peer network
There is a specific server and specific clients connected to the server in this network.	Clients and server are not distinguished; each node act as client and server in this network.
In this network, the client request for service and server responds with the service.	In this network, each node can request for services and can also provide the services.
Typically, cost is higher due to server costs.	Typically, cost is lower, as there is no need for dedicated servers.
When several clients request for the services simultaneously, a server can get blocked.	As the services are provided by several servers distributed in the peer-to-peer system, a server in not blocked.
More expensive, more stable, more scalable, easy to manage.	Less expensive, less stable, less scalable, harder to manage.
Examples: Websites, Email services, corporate networks	Examples: File sharing networks (BitTorrent), Blockchain