**Qn.1) Differentiate between OSI reference model and TCP/IP model.**

|  |  |
| --- | --- |
| OSI reference model | TCP/IP model |
| This model has 7 layers. | This model has 5 layers. |
| Designed to understand and standardize the functions of a telecommunication or computing system. | Designed specifically for the Internet and practical communication networks. |
| Does not specify protocols to be used in each layer rather, it provides a conceptual framework. | Specifies protocols to be used in each layer, making it more practical and widely used (e.g. IP, TCP, UDP). |
| More rigid and comprehensive, which can lead to complexity. | More flexible and simpler compared to the OSI model, which has contributed to its widespread adoption. |

**Qn.2) Difference between Peer to Peer network and client server network.**

|  |  |
| --- | --- |
| Peer to Peer Network | Client Server Netwok |
| In a P2P network, each computer (peer) has equal status and can act both as a client and a server. There is no central authority or dedicated server. | In a client-server network, there is a clear distinction between servers (which provide resources and services) and clients (which request resources and services). |
| Resources such as files, processing power, and bandwidth are shared directly between peers without relying on a central server. | Resources are hosted on central servers, and clients access these resources through requests. |
| P2P networks can easily scale as more peers join the network. Each new peer adds more resources to the network. | Scalability depends on the server’s capacity. Additional servers or more powerful servers are required to handle increased loads, which can be costly. |
| Because data is distributed among multiple peers, the network can be more resilient to failures. If one peer goes offline, others can still provide the necessary resources. | If the central server fails, clients cannot access the resources, leading to potential downtime. However, redundancy and load balancing can mitigate this. |

**Qn.3) What are the 7 layers of OSI model and what is the function of each layer?**

* The seven layer of OSI model are:

1. Physical Layer
2. Data link Layer
3. Network Layer
4. Transport Layer
5. Session Layer
6. Presentation Layer
7. Application Layer

Layer 1: Physical Layer

* This layer is concerned with the transmission of raw data bits over communication lines. The layer is implemented in the hardware of the networking devices.

Layer 2: Data Link Layer

* It provides a direct link control on the network. This layer is concerned with the reliable transfer of data over the communication channel provides by the physical layer. Data link layer breaks the data into data frames, transmits the frames sequentially over the channel and checks for transmission error.

Layer 3: Network Layer

* Networks layer determines the best path for data transmission. It provides routing and related functions that enable multiple data links to be combined into an internet works.
* Some functions of network layer are: routing and forwarding, packet handling and maintaining routing information.

Layer 4: Transport Layer

* It manages end to end connection. It accepts data from the above layer, splits it up into smaller units and passes these to lower layers isolation from each other. It manages end to end connection and data delivery between two hosts.

Layer 5: session Layer

* It allows users on different machines to establish sessions between them. It includes setting of various communication parameters like synchronization, dialog control. It determines the beginning, middle and end of session conversation.

Layer 6: Presentation Layer

* It selects data structure, provides data transfer syntax and semantics. It maintains the format of data and ensures the data is readable by the application. It involves data compression, decompression, encryption, decryptions, etc.

Layer 7: Application Layer

* It provides an interface between host communication software and any external application. It provides standards for supporting a variety of application independent services e.g. message handling system standard used for electronic mail, virtual terminal

**Qn.4) What are the principles behind OSI model.**

* The OSI model is based on the following principle :

-A layer should be created where a different abstraction is needed.

- Each layer should perform a well-defined function.

- The function of each layer should be chosen with an eye toward defining internationally standardized protocols.

-The layer boundaries should be chosen to minimize the information flow across the interfaces.

-The number of layers should be large enough that distinct functions need not be thrown together in the same layer out of necessity and small enough that the architecture does not become unwieldy.