1. The main difference between OSI model and TCP/IP model.

- Before starting with the comparison between the OSI model and the TCP/IP model, we need to start by addressing the similarities that both of these models have.

- Both models are based on the same layered architecture and they offer similar functionality. Also, both are protocol stack and reference models.

BASIS FOR COMPARISON	**OSI model (Open System Interconnection)**	**TCP/IP model (Transmission Control Protocol / Internet Protocol)**
Developed by	ISO (International Standard Organization)	The US department of defense (DoD)
Meaning	The OSI Model is a logical and conceptual (theoretical) model that defines network communication, acting as a communication gateway between the network and end-user.	TCP/IP is a client-server model used for the transmission of data over the internet. It is based on standard protocols around which the Internet has developed.
Obeys	Vertical approach	Horizontal approach
Type of usage	OSI model helps you to standardize router, switch, motherboard, and other hardware.	TCP/IP helps you to establish a connection between different types of computers.
Number Of Layers	7 Layers	4 layers
Tangible	OSI is not tangible	TCP/IP is tangible
Application layer	Composed from application + presentation + session OSI layer 7,6,5	Composed only from application layer TCP/IP layer 4

Transport layer	The transport layer from OSI model, is only connection-oriented. Layer 4	TCP/IP model is both connection-oriented and connectionless Layer 3
Network layer	Network Layer provides both connection oriented and connectionless service. Layer 3	Network internet Layer provides connectionless service. Layer 2
Physical and data link layer	In the OSI model, the data link layer and physical are separate layers. Layer 1,2	In TCP, physical and data link are both combined as a single host-to-network layer (network interface). Layer 1
Header size	The OSI header is 5 bytes.	The TCP/IP header is 20 bytes.

2. Explain the application service layers and what happen when you write your URL and click enter.

1- The application service layer:

The application service layer establishes the ground level foundation that exists to express technology-specific functionality. Services that reside within this layer can be referred to simply as application services. Their purpose is to provide reusable functions related to processing data within new or legacy application environments.

2- what happens when you write your URL and click enter:

1- we write the URL.

2- The browser checks the cache for a DNS record to find the corresponding IP. (If the requested URL is not in the cache, ISP’s DNS server initiates a DNS query to find the IP address of the server)

3- The browser initiates a TCP connection with the server.

4- The browser sends an HTTP request to the webserver.

5- The server handles the request and sends back a response.

6- The server sends out an HTTP response.

7- The browser displays the HTML content (for HTML responses, which is the most common).

3. Explain what is a domain name and the relation between the DNS and the @IP address.

The domain name system (DNS) is a naming database in which internet domain names are located and translated into Internet Protocol (IP) addresses. The domain name system maps the name people use to locate a website to the IP address that a computer uses to locate that website.

For example, when a Web address (URL) is typed into a browser, a DNS query is made to learn an IP address of a Web server associated with that name so the browser can load Internet resources.

The relationship between IP address and DNS is that a domain name is nothing more than a text version of the IP address.

4. Explain the TCP interconnection between your local host and the server.

Localhost has an IP address where the server has its own IP address too, with the routing function TCP helps in negotiation (requests-responses: TCP 3-way handshake) with the server bind, listen to the port, and open it to establish a connection with localhost.

5. How data transfer over internet (TCP Packet)

TCP Packets deals with the transport layer 4

* The transport layer 4 divide data into chunks or segments then transmit it to layer 3 with an end-to-end link and error control

* The network layer 3 divide the segments into packets and find the best path to the other end then the data is transmitted to layer 2

* The data link layer 2 divide the packets into frames with flow control and error control the data is transmitted to the physical layer

* The physical layer converts frames to physical support signals or bitstream.

For all these operations in transmission, then in reception, the layers do the inverse operation when reaching the other end.

Conclusion

In conclusion, we can say that the role of the OSI model is purely theoretical. it doesn't come into play in practice (in practice it will rather be the TCP / IP model). Yet, the OSI model is still taught because of its usefulness in separating concepts into modules (layers) that help people understand what is going on when they search in a web browser.