=) TCP :- Transmission control protocol (TCP) is a communication standard that enables application programs and computing devices to exchange messages over a network. It is designed to send packets across the internet and ensure the successful delivery of data and messages over networks.

=) main function of TCP :- The main function of TCP is to send packets across the internet and ensure the successful delivery of data and messages over networks. It guarantees the integrity of the data being communicated over a network.

=) IP :- The Internet protocol (IP) is the method for sending data from one device to another across the internet. Every device has an IP address that uniquely identifies it and enables it to communicate with and exchange data with other devices connected to the internet.

=) main function of IP :- The function of IP address is to define how applications and devices exchange packets of data with each other. It is responsible for routing data through the web and delivering data packets from one host to another.

=) working of TCP and IP (together) :- TCP and IP are separate protocols that work together to ensure data is delivered to its intended destination within a network. IP obtains and defines the address of the destination device, while TCP is responsible for transporting and routing data through the network architecture and ensuring it gets delivered to the destination application or device.

=> Layered Architecture of TCP/IP model :- The TCP/IP model is a protocol suite that consists of four layers :

① Application Layer :- This layer is closest to the end user and provides applications with access to the network. Protocols such as HTTP, FTP and SSH operate at this layer.

② Transport Layer :- This layer ensures that data is delivered reliably and efficiently from one point to another. Protocols such as TCP and UDP operate at this layer.

③ Internet Layer :- This layer is responsible for routing data through the web and delivering data packets from one host to another. The IP protocol operates at this layer.

④ Network Access Layer :- This layer provides reliable data links b/w devices, including protocols such as Ethernet and Wi-Fi.

3 - way Handshake Rule :- The 3-way handshake is a process that establishes a reliable connection b/w two devices over a TCP/IP network. The three steps are :

i) SYN (synchronize) :- The client sends a segment with the SYN flag set to initiate a connection with the server.

ii) SYN-ACK (synchronize-Acknowledge) :- The server responds with a segment that has both SYN and ACK flags set, acknowledging the client's request and sending its own SYN flag.

iii) ACK (Acknowledge) :- The client sends a final segment with ACK flag set, acknowledging the server's response and establishing the connection.

This 3-way handshake ensures that both devices are ready to communicate and establishes a reliable connection for data transfer.