What is the function of the routing table?

The routing table is a data table stored in a router or a network host that lists the routes to particular network destinations. The routing table contains information about the topology of the network immediately around it.The routing table contains network/next hop associations. These associations tell a router that a particular destination can be reached by sending the packet to the next hop on the way to the final destination. With hop-by-hop routing, each routing table lists, for all reachable destinations, the address of the next device along the path to that destination: the next hop. A routing table can also be used to generate a small forwarding table.

What is Fragmentation?

Fragmentation is the division of a datagram that is too large to be sent across the network into smaller units to match the MTU of a data link protocol. In an IP header the fields that are used by the fragmentation process are the identification number, the fragmentation flags and the fragmentation offset. The IP datagram header consists of a fixed, 20-byte section and a variable options section with a maximum of 40 bytes.

Explain TCP/IP Model?

The most widely used and available protocol is TCP/IP i.e. Transmission Control Protocol and Internet Protocol. TCP/IP specifies how data should be packaged, transmitted and routed in their end to end data communication. There are 4 layers that consist of Application Layer, Transport Layer, Network or Internet Layer and Network Interface Layer.

- **Application Layer**: This is the top layer in the TCP/IP model. It includes processes that use the Transport Layer Protocol to transmit the data to their destination. There are various Application Layer protocols that consist of HTTP, FTP, SMTP, SNMP,etc.
- **Transport Layer**: It receives the data from the Application Layer which is above the Transport Layer. It acts as a backbone between the host's system connected with each other and it primarily focuses on the transmission of data.The TCP and UDP protocols are the main protocols that are used within the Transport Layer.
- **Network or Internet Layer**: This layer sends the packets across the network. Packets primarily include the destination IP addresses, the source and actual data that is to be transmitted.
- **Network Interface Layer**: It is the lowest layer of the TCP/IP model. It transfers the packets between different hosts. It includes encapsulation of IP packets into frames, mapping IP addresses to physical hardware devices, etc.