1. **What are Pvt. IP address?**

The private **IP address** of a system is the IP address that is used to communicate within the same network. Using private IP data, information can be sent or received within the same network. For more details please refer to the difference between private and public IP addresses.

2. **What is the role of the TCP checksum field?**

One of the important fields of TCP protocol format. It is 16 bits long. This field holds the checksum for error control. It is mandatory in TCP as opposed to UDP. For more details, please read TCP/IP model article.

3. **What is PORT?**

A **port** is basically a physical docking point that is basically used to connect the external devices to the computer, or we can say that a port acts as an interface between the computer and the external devices, e.g., we can connect hard drives and printers to the computer with the help of ports. For more details please refer to various TCP and UDP ports article.

4. **Explain the process of three-way handshaking protocol?**

Process of three-way handshaking protocol

- **Step 1 (SYN):** In the first step, the client wants to establish a connection with the server, so it sends a segment with SYN(Synchronize Sequence Number) which informs the server that the client is likely to start communication and with what sequence number it starts segments.
- **Step 2 (SYN + ACK):** Server responds to the client request with the SYN-ACK signal bits set. Acknowledgment (ACK) signifies the response of the segment it received and SYN signifies with what sequence number it is likely to start the segment.

- **Step 3 (ACK):** In the final part, the client acknowledges the response of the server and they both establish a reliable connection with which they will start the actual data transfer.
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5. **What is the maximum size of the TCP header? What is the minimum size of TCP header?**
   - Maximum size of the TCP header = 60 bytes
   - Minimum size of the TCP header = 20 bytes
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6. **What are the Registered port and Dynamic port?**

Registered port: The ports ranging from 1024 to 49151 are not assigned and controlled by an IANA. They can only be registered with IANA to prevent duplication.

Dynamic port: This port ranging from 49152 to 65535 is neither controlled nor registered. They can be used in any process.

7. **What is tunneling?**

A technique of internetworking called **Tunneling** is used when the source and destination networks of the same type are to be connected through a network of a different type.

8. **What is NAT?**

Network Address Translation (NAT) is a process in which one or more local IP addresses are translated into one or more Global IP addresses and vice versa in order to provide Internet access to the local hosts.

9. What are the situations where NAT is required?

We need to connect to internet and our hosts don't have globally unique IP addresses

When we want to hide internal IP addresses from outside for security purposes.

Company is going to merge in another company which uses same address space

10. What are the advantages of NAT?

Conserves legally registered IP addresses

Prevents address overlapping

Provides security by hiding internal (private) IP addresses

Eliminates address renumbering as the network evolves.

11. What are the different types of NAT?

Static NAT

Dynamic NAT

Port address translation(overloading)

12. What are inside local,inside global,outside local,outside global address?

Inside local:Ip address of host before translation

Inside global: public IP address of host after translation

Outside local: address of router interface connected to ISP

Outside global: address of outside destination(ultimate destination)

13. What is static NAT?

One to one mapping that is it translates one private ip address to one public IP address

14. What is dynamic NAT?

Maps an unregistered IP address to a registered IP address from out of a pool of registered IP addresses.

15. What is Port address translation(overloading)

Maps multiple unregistered IP addresses to registered IP addresses using different port numbers. It allows thousands of users to connect to internet with only one public IP address