What is physical, logical and port address?

Physical Address (MAC Address): Assigned to every network interface card (NIC). Remains the same throughout the device's life.

Logical Address (IP Address): unique label assigned to every device connected to the internet.

Port Address: Identifies a specific application or service running on a device.

How to map physical address to logical address and vice-versa?

Address Resolution Protocol (ARP) is used to find a device's MAC address when its IP address is known.

Reverse ARP (RARP) is used to find device's IP address when it's MAC address is known.

Differentiate between broadcast, multicast, unicast and anycast.

Feature	Broadcast	Multicast	Unicast	Anycast
Target Audience	All devices in network	Specific group of devices	Single specific device	Nearest device
Network Efficiency	Inefficient	More efficient	Efficient	Efficient
Typical Use Case	Announcements	Video conferencing	Web browsing	CDN
Security Considerations	Least secure	Secure	Most secure	Security depends on underlying service

Out of various layers in TCP/IP model, name the layer used for: (i) Segmentation and reassembly of data. (ii) Combination of bits into bytes and bytes into frames. (iii) Hop to hop delivery (iv) Process to Process delivery (v) End to end delivery

(i) Transport Layer

(ii) Data Link Layer

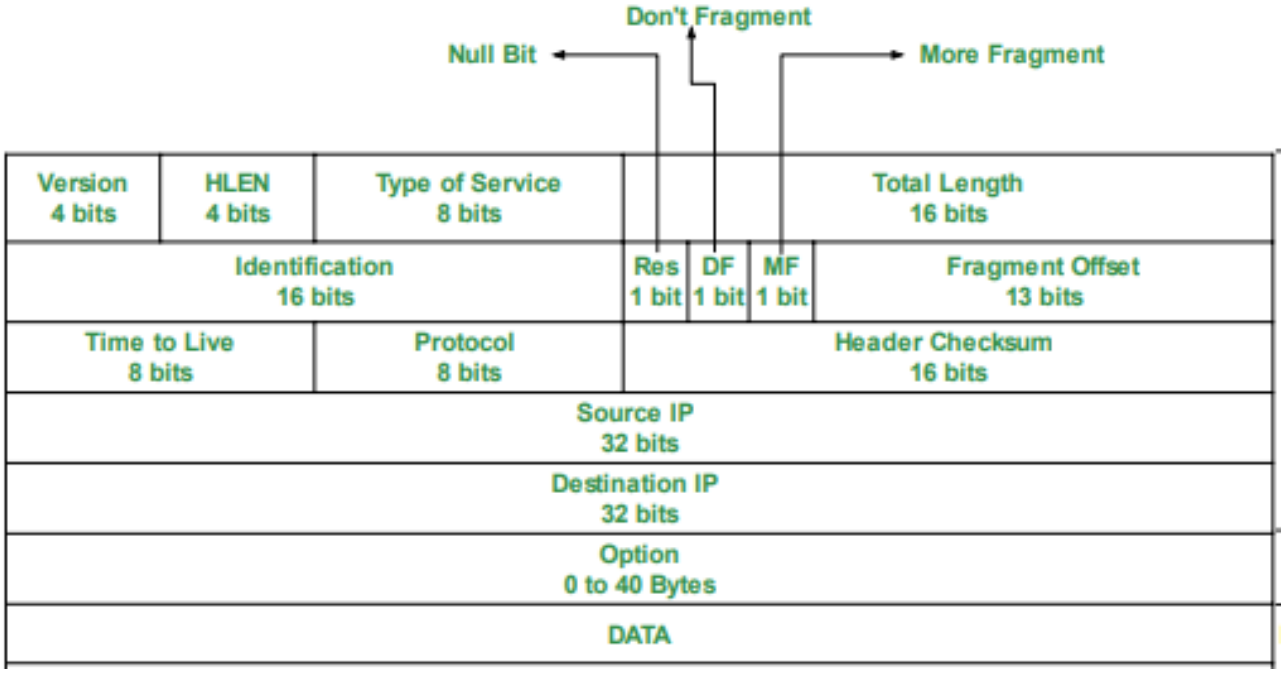
(iii) Network Layer

(iv) Transport Layer

(v) Application Layer

Why is IP called the best effort delivery protocol? Discuss IPv4 header format.

IP is called best-effort delivery protocol because in this, neither delivery is guaranteed nor proper sequencing or avoidance of duplicate delivery is assured.



VERSION: Version of the IP protocol

HLEN: IP header length

Type of service: Low Delay, High Throughput, Reliability

Total Length: Length of header + Data

Identification: Unique Packet Id for identifying the group of fragments

Flags: reserved bit (must be zero), do not fragment, more fragment

Fragment Offset: Represents the number of Data Bytes ahead of a particular fragment

Time to live: Datagram's lifetime

Protocol: Name of the protocol to which the data is to be passed

Header Checksum: Checks errors

Source IP address: IP address of the sender

Destination IP address: IP address of the receiver

Option: Optional information such as source route