Q1. What is the significance of MAC layer and in which position it is placed in the OSI model

- It is part of Layer 2: Data Link Layer.

- The Data Link Layer is divided into:

  Logical Link Control (LLC)

  Media Access Control (MAC)

So, MAC is at the lower part of Layer 2 in the OSI model, just above the Physical Layer

1.Determines when a device can transmit data, avoiding collisions on the network.

2. Uses MAC addresses (unique identifiers) to ensure data is sent to the correct device.

3. Helps organize data into frames and adds checks (like CRC) to detect transmission errors.

4. Collision detection and avoidance in Ethernet (CSMA/CD) and Wi-Fi (CSMA/CA)

Q2. Describe the frame format of the 802.11 MAC header and explain the purpose of each fields

- Frame Control (2 bytes): Identifies the type of frame, protocol version, flags

- ID (2 bytes): Time required to transmit the frame + ACK

- Address 1 (6 bytes): Receiver Address

- Address 2 (6 bytes): Transmitter Address

- Address 3 (6 bytes): BSSID or destination based on frame type

- Sequence Control (2 bytes): Frame sequence number + fragment number

- Address 4 (6 bytes, optional): Used in WDS or mesh networks

- QoS Control (2 bytes, optional): Used if QoS is enabled

- HT Control (4 bytes, optional): Used in 802.11n/ac/ax for high throughput features

- Frame Body (0–2312 bytes): Actual data or management info

- FCS (4 bytes): CRC used for error detection