# Unit -5 Random access protocols are a type of multiple access protocol used in computer networks, where nodes contend for access to a shared communication channel without a priori coordination. Here are some key points about random access protocols:

1. **Transmission at Full Channel Data Rate (R):**
   * When a node has a packet to send, it can transmit at the full channel data rate (R) without the need for synchronization or coordination with other nodes.
2. **No A Priori Coordination:**
   * Unlike scheduled access protocols, random access protocols do not require nodes to coordinate their transmissions in advance. Nodes simply transmit when they have data to send.
3. **Collision:**
   * If two or more nodes transmit simultaneously, a collision occurs. Collisions result in corrupted data and degradation of network performance.
4. **Random Access MAC Protocol:**
   * Specifies how to detect collisions.
   * Describes how to recover from collisions, often through mechanisms such as delayed retransmissions.
5. **Examples of Random Access MAC Protocols:**
   * **ALOHA:** In the ALOHA protocol, a node transmits its data whenever it is ready. Collisions are detected through feedback from the receiver, and the sender may attempt to retransmit after a random backoff period.
   * **Slotted ALOHA:** Slotted ALOHA divides time into slots and requires nodes to transmit only at the beginning of a slot. This reduces the chances of collisions and simplifies collision detection.
   * **Carrier Sense Multiple Access (CSMA):** CSMA protocols listen to the channel before transmitting. If the channel is sensed as busy, the node defers its transmission. CSMA has variants like CSMA/CD (Collision Detection) and CSMA/CA (Collision Avoidance).
   * **CSMA/CD (Collision Detection):** Used in Ethernet networks, CSMA/CD involves detecting collisions while transmitting and taking appropriate actions, such as stopping transmission and initiating a backoff period.
   * **CSMA/CA (Collision Avoidance):** Used in wireless networks, CSMA/CA involves nodes sensing the channel before transmitting to avoid collisions. It includes mechanisms for avoiding hidden node problems.