**4. Explain the scanning process and its types in detail**

Scanning is the process where a wireless device (like a laptop or phone) looks for nearby Wi-Fi networks before connecting. It helps the device decide which Access Point (AP) to connect to.

There are two main types of scanning in wireless networks:

**1. Passive Scanning**

* In passive scanning, the wireless device listens to the environment.
* APs periodically send beacon frames which contain information like SSID, supported rates, and capabilities.
* The device waits and collects these beacons from nearby APs.
* Once it gets enough info, it chooses the best AP to connect.
* Saves battery (no transmission needed).
* Useful in environments where devices must remain silent (e.g., some medical setups).
* Slower, as the device has to wait for beacons on each channel.

**2. Active Scanning**

* In active scanning, the device sends probe request frames on each channel.
* APs that receive this request will reply with probe response frames.
* Based on the responses, the device picks the best AP.
* Faster because the device actively asks for info.
* Better for quick roaming and connection.
* Consumes more power.
* Creates more traffic in the wireless medium.