**10. What are PPDU, PLCP, and PMD in the PHY layer?**

In Wi-Fi communication, the physical layer is responsible for transmitting bits over the air. It consists of different sublayers that work together to format and send data properly. The three important components in this layer are PPDU, PLCP, and PMD.

**PPDU (PLCP Protocol Data Unit):**

* The PPDU is the complete physical layer frame that gets transmitted over the air.
* It wraps up the MAC layer data (PSDU – PLCP Service Data Unit) with all the necessary PHY layer overhead.
* This includes the preamble, PHY header, and the actual data payload.
* It’s what the physical layer finally sends out after all processing is done.
* Basically, it’s the final "package" ready for wireless transmission.

**PLCP (Physical Layer Convergence Procedure):**

* The PLCP is a sublayer inside the physical layer.
* It handles the job of taking MAC layer data (MSDU) and preparing it for transmission.
* It adds important PHY overhead like the preamble and header to create a proper PPDU.
* It helps the receiver synchronize with the incoming signal and understand how to decode it.
* This layer ensures smooth handoff between MAC and the lower PMD layer.

**PMD (Physical Medium Dependent):**

* The PMD is the lowest layer in the physical layer stack.
* It deals with the actual transmission and reception of bits over the wireless medium.
* It performs critical tasks such as: Modulating and demodulating signals, Encoding and decoding data and Controlling the RF circuitry and handling signal transmission.
* It defines physical aspects like modulation type, frequency band, channel width, and power levels.
* PMD directly interacts with the RF hardware, it’s what physically sends and receives signals.