

WiFi Training Program 2025

Name: Aswath S

University: VIT Vellore

Reg.No: 21BEC2188

Question-4:

What is the significance of OFDM in WLAN? How does it improve performance?

OFDM (Orthogonal Frequency Division Multiplexing) digital modulation technique used in WLANs (Wi-Fi).

In OFDM:

1. Splits the signal into multiple smaller sub-signals,
2. Sends data simultaneously over many subcarriers,
3. All subcarriers are orthogonal, meaning they don't interfere with each other, even though they are very closely spaced.

So in WiFi 802.11a, the 20 Mhz channel is divided into 64 sub carriers, 48 carry actual data, 12 are unused (for guard bands), 4 are pilots (for synchronization).

Each subcarrier carries a piece of data using a modulation scheme like BPSK, QPSK, or QAM.

Significance of OFDM:

1. Supports high data rates- OFDM allows Wi-Fi to reach hundreds of Mbps to multiple Gbps. – this increases throughput
2. Modulation Flexibility- Each subcarrier can use different modulation schemes depending on signal quality.
3. High Spectral Efficiency- due to orthogonality.
4. Less interference.