

WiFi Training Program 2025

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Question-5:

How are frequency bands divided for Wi-Fi? Explain different bands and their channels.

Wi-Fi mainly operates on three frequency bands:

Band Name	Frequency Range	Wi-Fi Standards Used
2.4 GHz	2.400–2.4835 GHz	802.11b/g/n/ax
5 GHz	5.150–5.825 GHz	802.11a/n/ac/ax
6 GHz	5.925–7.125 GHz	802.11ax (Wi-Fi 6E), 802.11be

1. 2.4 GHz Band

- **Total bandwidth:** 83.5 MHz
- **Divided into 14 channels** (only 1–13 are common globally)
- **Each channel is 20 MHz wide**
- **Channels overlap, except for 1, 6, 11 (non-overlapping)**

2. 5 GHz Band

- **More channels**
- **Channels are non-overlapping**
- **Channel widths:** 20 / 40 / 80 / 160 MHz
- **Used by Wi-Fi 5 (802.11ac) and Wi-Fi 6**

3. 6 GHz Band (Wi-Fi 6E / 7)

- **Range:** 5.925 – 7.125 GHz → Offers 1,200 MHz
- **Supports up to 59 non-overlapping 20 MHz channels**

Comparison Summary

Feature	2.4 GHz	5 GHz	6 GHz
Speed	Low–Medium	High	Very High
Range	Longest	Medium	Short
Interference	High	Medium	Low
Channels	Few (overlapping)	Many (non-overlapping)	Many (non-overlapping)
Device Support	Most devices	Modern devices	Latest (Wi-Fi 6E/7) only