WiFi Training Program 2025

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Question-1:

What are the different 802.11 PHY layer standards? Compare their characteristics.

Standard	Frequency Band	Max Data Rate	Modulation	Channel Width	Year Introduced	Features
802.11 WIFI 1	2.4 GHz	2 Mbps	FHSS, DSSS(DPBPSK,DQPSK)	20 MHz	1997	Original standard, legacy now
802.11b WIFI 2	2.4 GHz	11 Mbps	DSSS(DBPSK,DQPSK,CCK)	20 MHz	1999	More range than 802.11a
802.11a WIFI 3	5 GHz	54 Mbps	OFDM(BPSK,QPSK,16-QAM,64-QAM)	20 MHz	1999	Faster, less interference
802.11g WIFI 3	2.4 GHz	54 Mbps	OFDM(BPSK,QPSK,16-QAM,64-QAM) +DSSS(CCK)	20 MHz	2003	Backward-compatible with 802.11b
802.11n WIFI 4	2.4/5 GHz	600 Mbps	OFDM(BPSK,QPSK,16-QAM,64-QAM)+ MIMO	20/40 MHz	2009	Introduced MIMO and channel bonding
802.11ac WIFI 5	5 GHz	6.93 Gbps	OFDM(BPSK,QPSK,16-QAM,64-QAM,256-QAM) + MU-MIMO	20/40/80/160 MHz	2013	Very high throughput, beamforming
802.11ax (Wi-Fi 6)	2.4/5/6 GHz	9.6 Gbps	OFDMA(BPSK,QPSK,16-QAM,64-QAM,256-QAM,1024-QAM) MU-MIMO	20/40/80/160 MHz	2019	9.6 Gbps (with 160 MHz, 8x8 MIMO)
802.11ax (Wi-Fi 6 E)	2.4/5/6 GHz	9.6 Gbps	OFDMA(BPSK,QPSK,16-QAM,64-QAM,256-QAM,1024-QAM)	20/40/80/160 MHz	2021	High efficiency, dense environments

Standard	Frequency Band	Max Data Rate	Modulation	Channel Width	Year Introduced	Features
802.11be (Wi-Fi 7)	2.4/5/6 GHz	46 Gbps	OFDMA(BPSK,QPSK,16-QAM,64-QAM,256-QAM,1024-QAM+ 4096-QAM)+ MIMO	up to 320 MHz	Upcoming	Extremely high throughput, low latency