

**Q5. How are frequency bands divided for Wi-Fi? Explain different bands and their channels.**

**2.4 GHz Band**

Longer range , Slower speeds.

High interference, Only 3 non-overlapping channels (1, 6, 11)

Supported by older and newer devices

**5 GHz Band**

Medium range, Faster speeds than 2.4 GHz

Less interference, More non-overlapping channels.

DFS channels may be restricted in some regions

**6 GHz Band (Wi-Fi 6E)**

Shortest range , Fastest speeds.

Very low interference, Needs Wi-Fi 6E compatible devices.

Ideal for high-speed, low-latency use.

**Q6. What is the role of Guard Intervals in WLAN transmission? How does a short Guard Interval improve efficiency?**

A Guard Interval is a short time gap inserted between symbols during wireless transmission.

It helps prevent inter-symbol interference caused by multipath propagation (signal echoes bouncing off walls).

By allowing echoes from one symbol to die out before the next symbol arrives, it maintains signal clarity.

**How a Short Guard Interval Improves Efficiency**

Less idle time between symbols = more data transmitted per second

Improves throughput by ~10%