**Q7: Configure your modem/hotspot to operate only in 2.4GHz and connect your laptop/Wi-Fi device, and capture the capability/properties in your Wi-Fi device. Repeat the same in 5GHz and tabulate all the differences you observed during this.**

**Comparison Table (2.4GHz vs 5GHz)**

|  |  |  |
| --- | --- | --- |
| Feature | 2.4GHz Band | 5GHz Band |
| Max Speed | Up to 600 Mbps (Wi-Fi 4) | Up to 9.6 Gbps (Wi-Fi 6) |
| Range (Coverage) | Longer range (~100m indoors) | Shorter range (~30m indoors) |
| Wall Penetration | Better (passes through walls) | Weaker (blocked by walls) |
| Interference | High (crowded with other devices like Bluetooth, microwaves) | Low (less interference) |
| Latency (Ping Time) | Higher (more congestion) | Lower (better for gaming/streaming) |
| Device Compatibility | Older devices support it | Only newer devices support it |

**Observations and Conclusion**

* **2.4GHz** is **better for long-range connectivity** and **works well through walls**, but it suffers from **more interference and lower speeds**.
* **5GHz** provides **higher speeds and lower latency**, making it ideal for gaming, video streaming, and fast downloads, but its **range is shorter** and does not penetrate walls effectively.
* **Wi-Fi 6 (802.11ax) devices perform better on 5GHz,** but older devices may only support 2.4GHz.