Q10. List down the Wi-Fi topologies and use cases of each one.

Basic Service Set (BSS)

A single Wi-Fi Access Point connects multiple devices in an infrastructure mode.
Use Cases: Home Wi-Fi, small offices, coffee shops.

Extended Service Set (ESS)

Multiple APs connected through a wired backbone to expand network coverage.
Use Cases: College campuses, corporate offices, airports, shopping malls.

Independent Basic Service Set (IBSS) – Ad Hoc Mode

Devices communicate directly without an AP (peer-to-peer).
Use Cases: Temporary file sharing, gaming networks, disaster recovery networks.

Mesh Wi-Fi Network

Multiple APs (nodes) wirelessly interconnect and share data dynamically to provide seamless coverage.

Use Cases: Large homes, smart cities, industrial IoT networks.

Point-to-Point (P2P)

Connects two locations wirelessly, acting as a bridge between networks.
Use Cases: Connecting remote offices, extending internet access between buildings.

Point-to-Multipoint (P2MP)

A central AP connects multiple remote locations wirelessly.
Use Cases: Rural broadband, city-wide Wi-Fi networks.

Wireless Distribution System (WDS)

APs communicate wirelessly instead of using a wired backbone, forming a multi-AP network.
Use Cases: Schools, large buildings, open spaces with multiple APs.

Wi-Fi Repeater Mode

A Wi-Fi repeater boosts an existing Wi-Fi signal to cover dead zones.
Use Cases: Large homes, hotels, office buildings with weak Wi-Fi coverage.

Wi-Fi Direct (Peer-to-Peer Mode)

Devices connect without an AP, similar to Bluetooth but with higher speed.
Use Cases: Wireless printing, smart TV casting, direct phone-to-phone file sharing.