Introduction to Wireless

**I. Benefits of wireless**

- Mobility: Access anywhere within range.

- Ease of Install: Less cabling, faster setup.

- Scalability: Easy to add devices.

- Productivity: Seamless access, collaboration.

- Accessibility: Connect in hard-to-reach areas.

**II. Benefits of wireless**

**- Wireless Personal-Area Networks (WPAN):**

+ These networks cover a **very small area**, typically within a few meters.

+ Examples include Bluetooth, used for connecting devices like headphones and smartphones, and Zigbee, used for home automation.

**- Wireless Local Area Network (WLAN):**

\* These networks cover a **limited area**, such as a home, office, or campus.

\* Wi-Fi is the most common WLAN technology.

- **Wireless Metropolitan Area Network (WMAN):**

+ These networks cover **a larger area**, such as a city or metropolitan area.

+ They provide broadband wireless access to a wider geographic region.

- **Wireless Wide Area Network (WWAN):**

+ These networks **cover the largest areas**, such as regions, countries, or even the entire globe.

+ Cellular networks (like 4G and 5G) and satellite communications are examples of WWAN technologies

**II. Wireless technologies**

**- Bluetooth:**

+ Bluetooth Low Energy (BLE) - This supports multiple network technologies including mesh topology to large scale network devices.

+ Bluetooth Basic Rate/Enhanced Rate (BR/EDR) - This supports point to point topologies and is optimized for audio streaming.

- WiMAX (Worldwide Interoperability for Microwave Access)

- Cellular Broadband

- Satellite Broadband

**Revision**

1. WPANs use low powered transmitter over short ranges of usually 20 to 30 ft. (6 to 9 meters).  
2. WLANs are based on the 802.11 standards and can cover up to the 300 ft. (100 meters).  
3. Bluetooth is an IEEE 802.15 WPAN standard that uses a device-pairing process to communicate.  
4. Both 802.11a and 802.11ac exclusively use 5 GHz radio frequency.  
5. The ITU-R standards organization is responsible for allocating radio frequencies.