Participation W9

Exercise 1:

What are the differences between the following channels for transferring data wirelessly?

- Microwave
- Satellite
- Radio
- Infrared

Can you find some real-life applications of these channels?

Sample Answer

Difference

1. Operating Frequency:

- Microwave: Typically in the gigahertz range (GHz).
- Satellite: Varies, including C-band, Ku-band, and Ka-band, among others.
- Radio: Wide range, from low frequency (LF) to ultrahigh frequency (UHF) and beyond.
- Infrared: Infrared spectrum, just beyond the visible range of light.

2. Range and Line-of-Sight:

- Microwave: Requires line-of-sight, limited to the visual horizon, and can be affected by physical obstructions and atmospheric conditions.
- Satellite: Broad coverage area with global reach; requires line-of-sight to the satellite, often above the Earth's atmosphere.
- Radio: Range varies widely; lower frequencies can cover thousands of kilometers and do not always require line-of-sight.
- Infrared: Short-range, typically within a few meters; requires line-of-sight or reflection and cannot penetrate solid objects.

3. Typical Applications:

- Microwave: Used in point-to-point communication systems like long-distance telephone transmissions, cellular networks, satellite communication links, and radar systems.
- Satellite: Includes satellite television, satellite internet, GPS systems, and global telecommunications.

- Radio: Employed in AM/FM radio broadcasting, mobile phone communications, Wi-Fi and Bluetooth technologies, and two-way radios in public and emergency services.
- Infrared: Common in remote controls for TVs and other consumer electronics, short-range data transfer (like IrDA standards), and some security systems.

Application

1. Microwave:

- Communication Links: Used in telephone networks and in the broadcasting and radio relay networks.
- Internet Access: Provides broadband Internet access in some areas.
- Wireless LAN Protocols: Like Wi-Fi, which operates at microwave frequencies.
- Radar Systems: Used for air traffic control, weather forecasting, and navigation systems.

2. Satellite:

- Satellite Television: Direct-to-home TV broadcasting.
- Satellite Phones: Used in areas where ground-based communication is unavailable.
- GPS Systems: For navigation and location tracking.
- Space Research and Exploration: Transmitting data from space missions.

3. Radio:

- Broadcasting: AM/FM radio broadcasting.
- Two-Way Radios: In emergency services, military, and public safety communication.
- Cellular Networks: Mobile phone networks.
- Remote Controls: For various consumer electronics.

4. Infrared:

- Remote Controls: For TVs, ACs, and other home appliances.
- Short-Range Communication: Infrared data association (IrDA) standards in older mobile phones and laptops.
- Optical Fibers: For certain high-speed data communication applications.
- Security Systems: Infrared sensors in security cameras and alarm systems.

Exercise 2:

↳ 3 cells hidden

Exercise 3:

↳ 4 cells hidden