CT # 02 Course Title: Advanced Computer Architecture (CSE-4821) Marks: 20

Assignment Student Id: 174078 Obtained: .....

Q1. How the use of Bluetooth, WiFi and 3G/4G do differs from each other in terms of designing wireless interfaces using IR and RF? 10

Q2. "LoRaWAN devices send small amount of data for a longer distance" – Justify the statement with example. 10

Answer Q1: Here is the differences between Bluetooth, WiFi and 3G/4G in terms of designing wireless interfaces using IR and RF.

Technology	Bluetooth	WiFi	3G/4G
Range	short-range (up to 30 Feet or 10 meters)	Medium-range (up to 300 feet or 100 meters)	Long-range (up to several miles)
Bandwidth	Low	High	High
Frequency	2.4 GHz	2.4GHz to 5GHz	28GHz to 39 GHz.
Interference Mitigation	Frequency-hopping spread spectrum (FHSS)	Orthogonal frequency division multiplexing OFDM	Multiple-input multiple output (MIMO) and adaptive modulation

Overall, the choice of technology depends on the specific application and the requirements for range, bandwidth, and interference mitigation.

Ans to Q2: LoRaWAN (Long Range Wide Area Network) is a type of wireless communication protocol that is designed to transmit small amounts of data over long distances with low power consumption. This makes it ideal for Internet of Things (IoT) applications where devices need to send periodic updates or sensor data to a center server.

An example of a LoRaWAN device is a smart meter that measures the consumption of electricity, gas or water. These devices are usually located in remote areas or inside buildings where cellular coverage is poor or nonexistent. By using LoRaWAN, the smart meter can transmit its readings over a long distance to a central server or gateway without consuming a lot of battery power.

Overall, LoRaWAN devices are well suited for applications where low power consumption, long-range transmission and low data rate are important factors.