LPWA Tutored Work N°2

Exercise1:

Based on the radar performance classification of the three IoT connectivity technologies on Figure 1, select the adequate technology for each IoT application listed in Figure 2 according to their needs.
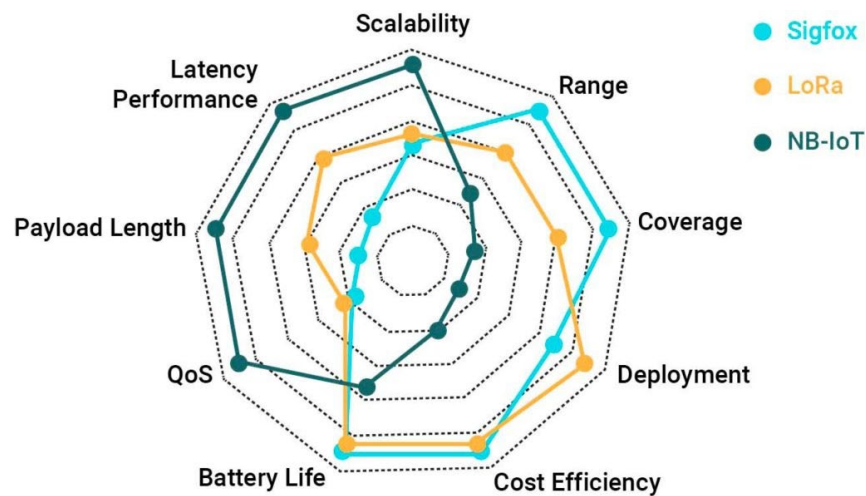

Figure 1: IoT Connectivity Comparison

Figure 2: Examples of IoT applications and their needs

Exercise2:

3GPP introduced new recommendations referred to as LTE-M and NB-IoT from Release 13 to serve IoT devices more efficiently.

1- Cite the main differences between the LTE-MTC and NB-IoT recommendations.
2- What are the major modifications bought by the NB-IoT standard to make LTE architecture optimized for IoT applications?
3- NB-IoT is a half-duplex technology. Explain how this mode helps to increase the battery life.

Exercise 3:

NB-IoT standard can be deployed with respect to three frequency bands as listed in the following table. You are asked to analyze the three modes by filling the property of each mode according to the spectrum, cost, and upgrades criteria.

Criteria	Standalone	In-Band	Guard-Band
Regularity Approval			
Spectrum purchasing			
Co-existence Impact on deployed mobile networks			
Antenna System Upgrade			
Base Band Units Upgrade			

Exercise 4:

We consider an IoT temperature sensor sending the data to the end application after each 413mins and receives an ACK after 30s from sending the data. This device is configured on PSM and eDRX features to save power. Identify the PSM timers values to make this device able to send and receive data at the specified periods. You can consider 4 eDRX cycles to ensure a good reception of the ACK from the application server.