Group A [4 + 3 + 3 marks] **Group B**

1. Analyze the below case study, and draw the architecture diagram of the given IoT system. Label all components in diagram.
2. A temperature sensor has an error of up to 0.25°C and a resolution of 0.1°C. If the actual temperature is 25.4°C, what possible values can be reported by the sensor?
3. Some IoT devices can harvest energy from environment. Discuss any two sources of energy harvesting with examples.

On a modern cattle farm, animals are equipped with multiple wearable sensors. Animals developing sickness symptoms are quickly identified and isolated in order to prevent the spread of bacterial or viral infections.

1. Analyze the below case study, and draw the architecture diagram of the given IoT system. Label all components in diagram.
2. A light sensor detects illumination levels with a sensitivity of 0.2 lux. If the actual illumination levels are 150.34, 151.71, 149.8, and 152.03 lux, what values will the sensor report?
3. What steps a designer of sensor board should take to reduce the energy consumption of their hardware?

A restaurant installs food-supplies monitoring devices in their cold storage room. The system provides reports on current stock levels, predicts the stock ending dates, and recommends when new orders to be placed.

A

1

A general architecture is given in Lec 1 slides 42-43. Students should adapt it to given case study. At the very least, they need to include 2-3 sensors in sensor layer, one device in edge layer and a cloud layer. Furthermore, 1/4 mark for mentioning the functions performed in cloud and edge layers (e.g sickness prediction algorithm in cloud layer)

2

The measured temperature can deviate within the range of 25.4 ± 0.25, which is 25.15°C to 25.65°C. Since the sensor has a resolution of 0.1°C, it can only report values rounded to the nearest 0.1°C. The possible reported values within this range are 25.2°C, 25.3°C, 25.4°C, 25.5°C, and 25.6°C.

3

L3 slides 29-30

B

1

See A1

2

The sensor can only report values in increments of 0.2 lux. Each actual illumination level must be rounded to the nearest multiple of 0.2.

Thus it will report 150.4, 151.8, 149.8 and 152.0.

3

L3 slides 28