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

Group A

1. List some differences between traditional computers & IoT devices.

2. Analyze the following case study, and draw the architecture diagram of the given IoT system. Label all components in diagram.

3. A weight sensor reports a measurement of 48 kg. The sensor has a positive bias of 0.6 kg and an error of up to 0.4 kg. Determine the possible actual weight of the object.

Lahore Orange Line trains are equipped with multiple sensors so that passengers waiting at the train stations get to see (1) ETA: how long before the next train arrives, (2) occupation level: how much crowded is the upcoming train. Display screens are installed at stations to show this information.

Group B

1. Explain the concept of "Smart Cities" with an example of an IoT application.

2. Analyze the following case study, and draw the architecture diagram of the given IoT system. Label all components in diagram.

3. A pressure sensor has a resolution of 0.05 psi and a bias of -0.2 psi. If the actual pressure is 31.8 psi, what would the sensor likely report?

In a shopping mall hallways, digital advertisement screens are installed. Each screen is equipped with multiple sensors (camera, proximity, motion) to gauge how many people stop by to watch the ad. The system provides detailed audience-engagement analytics for each ad.

A

1

Traditional computers are general purpose (can be used for lots of applications) and usually have ample computational/memory/storage resources. IoT devices are special purpose, and very resource constrained.

2

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 ETA calculation in cloud layer)

3

Given positive bias 0.6, the actual weight would be 47.4 kg. Error is ±0.4 kg, so the possible actual weight range is: 47 to 47.8kg

B

1

Lec 1 slides 15-16

2

See A2

3

The sensor will likely report 31.60 psi, considering the bias of -0.2 psi and the resolution of 0.05 psi.