

Status	Finished
Started	Monday, 15 September 2025, 5:04 PM
Completed	Monday, 15 September 2025, 5:30 PM
Duration	25 mins 16 secs
Grade	Not yet graded

Question 1

Complete

Marked out of 1.00

Explain the difference between a **sensor** and an **actuator** in IoT. Provide one industrial example of each.

A sensor is a device that measures a physical things and transform to a signal, and the actuator is also a device but the functionality is get signals and do a physical action.

A temperature sensor.

Turn on a light can be an actuator.

Question 2

Correct

Mark 1.00 out of 1.00

Match the following sensors with their operating principle

PIR motion sensor	Pyroelectric effect	✓
Camera (CMOS)	Array of photodiodes + Bayer filter	✓
MEMS gyroscope	Coriolis effect	✓
Photodiode	Photoelectric effect	✓
Thermocouple	Seebeck effect	✓

La resposta és correcta.

The correct answer is: PIR motion sensor → Pyroelectric effect, Camera (CMOS) → Array of photodiodes + Bayer filter, MEMS gyroscope → Coriolis effect, Photodiode → Photoelectric effect, Thermocouple → Seebeck effect



Question 3

Complete

Marked out of 1.00

PIR motion sensors are prone to false positives. Mention one source of interference and explain why it affects the sensor's output.

One source of interference can be the hot air cause alters the temperature of the surroundings and this can effects to the sensor's output.

Question 4

Complete

Marked out of 1.00

Why does the resolution (in bits) of an ADC matter? Explain how quantization error can influence IoT applications.

Matters cause the ADC defines the physical quantity that will be represented digitally.

Quantization error can influence IoT applications cause for the same output it can be interpreted like a good value or not depending on that.

Question 5

Complete

Marked out of 1.00

When choosing a sensor, what is a common trade-off between sensor characteristics? Mention 3 relevant characteristics (e.g. selectivity, this one does not count).

The accuracy, sensitivity and the power consumption.



Question 6

Complete

Marked out of 1.00

You are deploying a vibration sensor on a drone. The raw accelerometer signal is overwhelmed by motor noise. Mention one hardware and one software preprocessing techniques you would recommend, and why?

We need to implement a noise reduction preprocessing technique. we can implement a low pass filter to mitigate the noise this filter can be hardware or software processing the data before send it.

Question 7

Complete

Marked out of 1.00

Compare edge and cloud data processing in terms of latency, power consumption, and reliability. In which scenario would each be preferable?

Edge data processing have a very low latency, normal power consumption and higher reliability than cloud. But cloud have a higher latency, a more efficiently power consumption.

Edge data is better for real time control like autonomous vehicles, and cloud

Question 8

Not answered

Marked out of 1.00

Mention one method to optimize neural networks for edge AI.

