

Electronic Instrumentation Problem sheet: Resolution

2011/2012 module 2

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MIEET 3º ano

1:

- a) What is the resolution of a type-S thermocouple ($5.88 \mu\text{V}/^\circ\text{C}$) connected to a 12 bit ADC (0-5 V).
- b) What amplifier would be needed to make the sensor work between 0°C and 40°C (the reference temperature is 20°C). What would be the resolution then.

2:

We want to build a temperature monitor system based on an Arduino microprocessor board (and its built-in ADC) and an LM35 temperature sensor. Look at the datasheets of these items.

- a) Find out what is the digital resolution of the system.
- b) Design a way to increase the resolution

3:

Design a system based on a thermistor of nominal value $10 \text{ k}\Omega$ and an Arduino ADC.

- a) What is the response function $H(T)$?
- b) What is the sensitivity S ?
- c) What is the range?
- c) What is the final digital resolution?