



Department of Electrical and Computing Engineering

UNIVERSITY OF CONNECTICUT

ECE 3411 Microprocessor Application Lab: Fall 2015

Question XI

There is 1 question in this quiz. There are 2 pages in this quiz booklet. Answer each question according to the instructions given.

You have **5 minutes** to answer the questions.

If you find a question ambiguous, be sure to write down any assumptions you make.

Be neat and legible. If we can't understand your answer, we can't give you credit!

Write your name in the space below. Write your initials at the bottom of each page.

**THIS IS A CLOSED BOOK, CLOSED NOTES QUIZ.
PLEASE TURN YOUR NETWORK DEVICES OFF.**

Any form of communication with other students is considered cheating and will merit an F as final grade in the course.

Do not write in the box below

Total (xx/10)

Name:

Student ID:

1. You have designed a digital thermometer using the ATmega328P ADC and the temperature sensor. The ADC is running on full resolution and its reference voltage is set to $1.1V$. If the temperature sensor produces $314mV$ at $25^{\circ}C$ and its voltage sensitivity is $1mV/^{\circ}C$ then answer the following questions:

a. *Theoretically*, what is the **maximum** and **minimum** value of temperature that you can measure using this thermometer?

b. What is the **smallest change** in temperature (in $^{\circ}C$) that can be detected by this thermometer? Be as accurate as possible in your calculations.

c. If the ADC reference voltage is changed to $512mV$, then what would be the **smallest change** in temperature (in $^{\circ}C$) that can be detected by this thermometer?

End of Question

Please double check that you wrote your name on the front of the question.

Initials: