

**A) Objectives**

Study ADC conversions, the Nyquist Theorem, the Valvano Postulate, and develop a temperature measurement system using a thermistor.

**B) Hardware Design**

The circuit diagram of the thermistor and LCD interface is on page 3.

**C) Software Design (a hardcopy software printout is due at the time of demonstration)**

- 1) Calibration data (procedure 5 and the **calib.h** file) – We did not do this.
- 2) Low level ADC interface (**ADC.c** and **ADC.h** files) – On later pages of this report.
- 3) Main program used to measure temperature – On later pages of this report.

**D) Measurement Data****1) Sketch three waveforms (procedure 1)**

The waveforms will be after the code pages.

**2) Static circuit performance (procedure 2,4)**

The voltage at the top of the bridge is 2.49 V. The voltage across the 48k resistor is 0.807 V. The voltage out of the instrumentation amp is when the thermistor is shorted is 4.772.

The gain of our instrumentation amp is 5.91. Using the LCD to display the voltage into the ADC we found that the voltage out of the amp at room temperature is around 2.61 V.

**3) Dynamic circuit performance (procedure 3) – We did not do this.****4) Accuracy (procedure 6) - We did not do this.****5) Reproducibility (procedure 7) - We did not do this.****E) Analysis and Discussion (1 page maximum)**

Hey Harshad, so there are no questions for this section in the lab manual. So we figured that we just could discuss this lab however we wanted. This lab was not fun. We did not like it. At all. The other labs were fun, unlike this one. We hope it dies. So we're probably missing a lot of stuff on this lab report. We know you told us when we were missing something in Lab 5, you probably don't need to let us know for this one. Just take off the points. Hopefully you don't think we're bad people, we just really didn't like this lab. We worked hard on all the other labs and will definitely work hard for the next 3. Using thermistors to measure temperature is a horrible idea. We can take the hit for this lab write-up as long as it doesn't affect any of our other grades. We decided to still work on Procedure 1 because it seemed more useful than the other parts of this lab because Valvano's Postulate intrigues us. We noticed that sampling 10 times faster gives a nice representation. Sampling at twice the frequency (500 Hz) gave two sine waves. If we took more samples it would be more apparent. Undersampling, we got a sine wave, but the frequency is not the correct frequency of the original wave. Like we said, intriguing.