**ECE 1001/1002 Introduction to Robotics**

**Lab #5: Analog Outputs and PWM**

Names \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Section: \_\_\_\_\_\_

## Requirements and Signoffs

Show your instructor the result with part g, and hand in your signoff paper. T/A: \_\_\_\_\_\_\_\_\_

Question 1) 5b, Describe on your sign-off paper what you see.

To the human eye, it appears that the LED has a duty cycle of 100%.

Question 2) How does this compare to the last part of program a where all three LEDs were turned on? Does it look about the same?

It looks the exact same as when the LED were on 100% of the time.

Question 3) How does the light look compared to the part b program? For comparison, Part b was a 93% duty cycle:

The LED looks much dimmer with a 13% duty cycle.

Question 4) What difference do you see? Can you detect any flicker in programs a, b, c, or d? Try changing the on and off times to the shortest value you can still see a flicker, what timing is that?

The LED is dimmer than the 93% duty cycle but not quite as dim as the 13% duty cycle. I don’t notice any flicker with any of the programs, unless you count the blinking in part a. I can still notice a very slight flicker at 17 ms.

Question 5) Try changing the PWM value to other (integer) numbers between 0 and 255, and describe what happens. 0 is off, and 255 is all the way on.

It changes the brightness and the color, for example if you put red and green at 255 and blue at 0 you

Would get a very bright yellow light, but if you put red and green at 50 and blue still at 0 you would get a very dim yellow light.

Question 6) Play with the values, and try a few things. Describe what happens.

The lower the delay the faster it cycles, higher the number you add to the count the faster it cycles.

To receive credit for this lab, you *must* get the sign-off before the due date (see Canvas), during class time or with a TA during their hours. The instructor will not signoff outside of class hours. Partial credit is allowed.