

ME 430 Exam 2, Fall 2010-2010, All Sections

Name_____

Section_____

Ground rules for the exam:

7:00pm - 8:15pm

Group #1, Last name earlier in the alphabet

8:30pm - 9:45pm

Group #2, Last name later in the alphabet

Group #1 may not leave the room until 8:15.

Group #1 should bring the PICDEM 2 kits.

Group #2 should return everything to the locker.

You may use only:

- Any paper notes (including course handouts) you brought to the exam, or electronic notes residing on your local (C:) hard drive.
- The course website, including any code from the website. (This is the only approved use of the internet for this exam.)
- Code written by you or by your lab partner(s).
- A pencil/pen.
- A calculator (optional).
- The PICDEM2 board and its accessories.
- ANGEL for code submission.

Anything not specifically allowed is prohibited. In particular, you may not use code written by someone outside your lab group unless it came from the course website.

For all problems:

If your code for one of the problems works properly, you should get it checked off. There are points associated with the check off itself.

The only code in the programs should be the code which is necessary to accomplish the task—points will be deducted if there is extra stuff that we need to sort through. At the end of the test (or before), place the code in the ANGEL drop box. If you use the Chrome web browser please email the code to your instructor instead.

Problem	Points	Checkoff
1	/18	/2
2	/18	/2
3	/18	/2
4a	/18	/2
4b	/18	/2
	/90	/10
Total	/100	

Problem 1 – Clocks, Outputs, and Delays

In this problem you will be creating a program that toggles (changes the state of) the RB2 LED every 2 seconds.

IMPORTANT NOTE: For the RB2 LED to function you need to **make sure the jumper, J6, is connected.**

Start this problem from “template.c” but rename the file “Problem 1 (your name).c”. Use a 4 MHz clock speed and delays within the main routine. Turn RB2 on for 2 seconds, then off for 2 seconds, then on for 2 seconds, etc.

Problem 2 – Clocks, Outputs, and Timer Interrupts

In this problem you will *also be* creating a program that toggles (changes the state of) the RB2 LED every 2 seconds, this time using interrupts.

IMPORTANT NOTE: For the RB2 LED to function you need to **make sure the jumper, J6, is connected.**

Start this problem from “template with interrupts.c” but rename the file “Problem 2 (your name).c”. Create a Timer 0 interrupt that occurs every 2 seconds using the 4 MHz clock. When the interrupt occurs it should toggle (change the state of) the RB2 LED.

Problem 3 – ADC

In this problem you will be creating a program that turns on the RB2 LED when the potentiometer is very low, and turns on RB2 when the potentiometer is very high.

IMPORTANT NOTE: For the RB2 LED to function you need to **make sure the jumper, J6, is connected.**

Start this problem from “template.c” but rename the file “Problem 3 (your name).c”. Read the analog value from the potentiometer. If the value is larger than 500, turn on RB2. Otherwise, RB2 should be off.

(Problem 4 on next page.)

Problem 4 – LCD and Pushbutton Interrupts

In this problem you will be displaying a '*' on the LCD, then displaying '**' when the RB0 pushbutton is pressed.

IMPORTANT NOTE: For the RB0 pushbutton to function correctly you need to **make sure the jumper, J6, is disconnected.**

Start this problem from "template with interrupts.c" but rename the file "Problem 4 (your name).c".

- (a) Make the LCD display a * in the top line on the far left. When this works you can get this checked or continue working and get (a) and (b) checked off at the same time.
- (b) Create an RB0 interrupt and change the LCD display to show a ** when the interrupt occurs.