

ECE 3724 Quiz #10 Reese NAME: \_\_\_\_\_  
Answer each of the following questions (you can use a calculator)

- a. (3 pts) Write code that continually loop, reading the AN1 channel on the PIC18 A/D, and only exits when the voltage rises above 4 V. Assume the PIC18 A/D has been configured for left justification, and that you only care about the upper 8 bits, and that Vref+ is 5V and Vref- is 0V.

```
CHS2 = 0; CHS1 = 0; CHS0 = 1; // select channel  
DelayUs(20); // delay  
do {  
  GODONE = 1; //start a conversion  
  while(GODONE); //wait for end of conversion  
}  
while (ADRESH < 205);
```

$$\begin{aligned}\text{Code} &= \text{Vin}/\text{Vref} * 2^N \\ &= 4 \text{ V}/5\text{V} * 256 \\ &= 205\end{aligned}$$

- b. (3 pts) Assume an FOSC of 20 MHz, and PRE= 1, POST = 3, and PR2 = 100, how often is the TMR2 interrupt flag set?

$$\begin{aligned}\text{Timer 2 interrupt period} &= 4/\text{FOSC} * (\text{PR2}+1) * \text{POST} * \text{PRE} \\ &= 4/20 \times 10^6 * 101 * 1 * 3 = 6.06 \times 10^{-5} = 60.6 \text{ us}\end{aligned}$$

- c. (4 pts) Write C code that will cause 1.0 V to appear on the output of the MAX517 DAC assuming a VREF of 5.0 V. Assume the address control lines (AD1, AD0) are both tied low. Use the functions i2c\_start(), i2c\_get(char ackbit), i2c\_put(char byte), i2c\_stop(), i2c\_rstart() to accomplish this.

```
i2c_start();  
i2c_put(0x58); //DAC Address  
i2c_put(0x00); //DAC command, do conversion  
i2c_put(51); //value to convert  
i2c_stop();
```

$$\begin{aligned}\text{Code} &= \text{Vin}/\text{Vref} * 2^N \\ &= 1 \text{ V}/5\text{V} * 256 \\ &= 51.2, \text{ round to } 51\end{aligned}$$