ECE 3724/CS 3124 Quiz #8 Reese   NAME: _____
Answer each of the following questions (you can use a calculator)

a. (3 pts) Give PRE, POST, and PR2 values for a timer2 period interrupt with a period of 20 ms. Assume an FOSC of 25 MHz.

Period = (PR2+1)*4 * (1/Fosc) * PRE *POST
PR2 =[(period*Fosc)/(4*Pre*Post)] – 1
Le pre=16, post = 16
PR2 =[(0.02*25e6)/(4*16*16)] – 1 = 487   too big. It is NOT POSSIBLE to generate this an interrupt with long of a period using timer2!

b. (3 pts) Write C code that configures timer1 for a prescale of 1:4, 16-bit read/write mode, turns timer1 ON, and chooses the internal clock (FOSC/4). Also configure the Capture/Compare/PWM module to do a capture from Timer1 on the CCP1 pin every RISING edge. You cannot assume any default bit values, and you must use individual bit assignments for clarity.

RD16 = 1 ;// 16 read/write
T1CKSP1 = 1; T1CKSP0 = 0;   //pre=4
TMR1CS = 0;   // internal clock
TMR1ON = 1;
T3CCP2 = 0; T3CCP1 = 0;   //capture Timer1 value
CCP1M3 = 0; CCP1M2=1; CCP1M1=0; CCPM0 = 1; //rising edge capture

c. (4 pts) Assume the code used in lab to measure the pulse width of a pushbutton switch. On the falling edge (pushbutton pressed), the capture register captures the hex value 0xFF00 from timer1. On the rising edge (pushbutton released), the capture register captures the value 0x0080 from Timer1, with one timer1 overflow between the falling and rising edge captures. Assuming a Timer1 prescale of 8, an FOSC = 16 MHz, and using the internal clock, how long is this pulse width in microseconds?

delta = (tmr1_overflows –1)*65536 + (0-A) + B
     =   (1-1) *65536 + (0x0000 – 0xFF00) + 0x0080
     =   0 + 0x100 + 0x0080 = 0 + 256 + 128 = 384 Timer1 tics

1 timer1 Tic period = 4/Fosc *Pre = 4/16 MHz * 8 = 2 μs

384 timer1 tics * 2 μs = 768 μs.