Laboratory Activity - 18F4520 Basic I/O

Answer the following questions to the best of your ability:

General Questions

1) Find the hardware pin number for Port A pin 0 and Port D pin 0.

2) Explain the difference between *TRISC = 0x0F; and *PORTC=0x0F;

3) Write the address of the following registers

    a.   PORTA

    b.   TRISB

    c.   ADCON1

4) Write the instruction that assigns a pointer to register ADCON1

5) Assume you have an LED connected in PORTC pin RC4.

    a.   Draw the circuit described above in PROTEUS ISIS 7.
    b.   Compile the following code in PCW-CCS (PICC).

```
#include <18F4520.h>
#use delay (clock = 20000000)
#fuses HS, NOWDT, NOLVP
#include "yourLibrary"   // Modify This line to your particular case.
main(){
    *TRISC = 0xFF;
    *PORTC = 0x00;
    while(1){
        *PORTC ^= 0x01;
        delay_ms(500);
    }
}
```

c. What is *TRISC = 0xFF doing?

d. What is *PORTC ^= 0x01 doing?

e. Use the HEX file created in the previous step to load it into PROTEUS. Make sure you can verify the hardware is properly executing the program. You do not need to get your instructor signature for this step. Just make sure you know how to load and execute the program.

6) Consider the following code to turn LED ON and OFF on PORTB pin RB1. Please look at your class notes carefully. This code requires some troubleshooting.

```
#include <18F4520.h>
#use delay (clock = 20000000)
#fuses HS, NOWDT, NOLVP
#include "yourLibrary"          // Modify This line to your particular case.
struct myPort{
    int unused:7;
    BOOLEAN led;
};
                                //There is a line missing here
main(){
                                // There is a line missing here
    *TRISC = 0x00;
     PORTC -> led = 0;
     while(1){
         PORTC->led = PORTC->led ^ 1;
         delay_ms(500);
     }
}
```

a. Use the HEX file created in the previous step to load it into PROTEUS. Make sure you can verify the hardware is properly executing the program.

7) Assume you want to connect a switch (or push button) to PORTC pin RC0 and an LED to PORTC pin RC7.

    a. Draw a schematic of circuit described above in ISIS7.

    b. Draw the circuit described above in PROTEUS ISIS 7.

    c. Compile the following code in PCW-CCS (PICC)

```
#include <18F4520.h>
#use delay (clock = 20000000)
#fuses HS, NOWDT, NOLVP
#include "yourLibrary"   // Modify This line to your particular case.
main(){
    *TRISC = 0x01;
    *PORTC |= 0x80;
    while(1){
        if(*PORTC & 0x01){
            *PORTC |= 0x80;}
        else{
            *PORTC&=0x7F;
        }
        delay_ms(500);
    }
}
```

    d. What is if(*PORTC & 0x01) doing?

    e. Use the HEX file created in the previous step to load it into PROTEUS.

    f. Repeat this problem on PIN B2 as an input and PIN B3 as an output.

8) Consider the following code to test an input on PIN RC0 while relaying the output to RC7. Please look at your class notes carefully. This code requires some troubleshooting.

```
#include <18F4520.h>
#use delay (clock = 20000000)
#fuses HS, NOWDT, NOLVP
#include "yourLibrary"   // Modify This line to your particular case.
main(){
    *TRISC = 0x00;
    PORTC -> led = 0;
    *ADCON1 = 0x0F;
    while(1){
        if( PORTC -> switch_input )
```

```
                PORTC->led = 1;
            else
                PORTC->led = 0;
            delay_ms(500);
        }
    }
```

a. What is this code supposed to do? Explain in your own words.

b. Draw a circuit schematic that can make this work.

c. Present the final circuit to your instructor. _____