

EE361 Microprocessor-based Digital Design

Fall 2009

Machine Language and Assembly Language

Assignment 3

1. Consider the following program fragments for the PIC16F884. The listing shows declarations from the beginning of the program source code file and assembly language instructions from further along in that file.

```
1 XX      equ H'4A'  
2 YY      equ H'0D7'  
3 ZZ      equ H'22 '  
4 RP1     equ H'6 '  
5 RP0     equ H'5 '  
6 F       equ 1  
7 STATUS  equ H'03 '  
8         ...  
9         bcf     STATUS,RP1  
10        bsf     STATUS,RP0  
11        movlw   XX  
12        addlw  YY  
13        movwf  ZZ
```

Bearing in mind that data addresses require nine bits, use hexadecimal to express the address at which will the result be stored. Data values in data memory require eight bits. Use hexadecimal to express the value stored at that address. What will be the values of the Z, DC, and C bits of the STATUS register after this code fragment has been executed?

2. Consider the following program fragment:

1	Row	equ	D'161 '
2	Value	equ	D'355 '
3	Status	equ	H'03 '
4	RP1	equ	H'6 '
5	RP0	equ	H'5 '
6	STATUS	equ	H'03 '
7			...
8	movlw	Value	
9	bsf	Status ,RP1	
10	bcf	Status ,RP0	
11	movwf	Row	

What (eight-bit) value will be stored and at what (nine-bit) register address will it be placed? Express both values in hexadecimal and explain your answer carefully.