ECE 3724/CS 3124 Quiz #4 Summer '04 Reese

NAME: _____

You may NOT use a calculator. You will be provided with Table 20 out of the PIC18 datasheet. Assume the following memory/register contents at the beginning of each instruction:

Location	Contents:
0x023	0x38
0x024	0xC7
0x025	0x9B
0x026	0xFE

a. (2 pts) Convert -45 to an 8-bit, two's complement hex number.

-45, determine the magnitude first. 45 = 2*16+13 = 0x2D. Number is negative, so compute – N as 0-N, or 0x00 – 0x2D = 0xD3, final answer.

b. (2 pts) What operation and what flag test conditions are used for the comparison "i >= j" if i, j are 'signed int' variables?

Must perform the subtraction "i – j", and check (V=0 and N=0) or (V=1 and N=1). Reasoning: If i >= j, and i – j produces the correct result (V=0), then result is positive (N=0). If overflow occurs (V=1), then result is wrong, and is negative (N=1).

c. (2 pts) Write the following in PIC assembly:

```
int   k, j;

k = k  +  j ;
```

```
movwf  j, w        ;get least significant byte
addwf  k, f        ; add least significant byte
movwf  j+1, w
addwfc  k+1, f     ;add most significant byte with carry
```

d. (2 pts) In the code below, give the value of FSR0 and any changed memory locations after the instruction sequence is executed.

```
lfsr     FSR0, 0x024
incf     POSTDEC0, f
```

First instruction loads FSR0 with the value 0x024. Second instruction increments location ((FSR0)), then does FSR0 - - (post decrement). Location that is incremented is 0x024, so contents of 0x024 is changed to 0xC8. Final value of FSR0 is 0x023.

e. What value is pushed on the stack by the 'call' instruction in the code below?

Location:	Contents	Instruction
0x0200	EC80 F001	call 0x300
0x0204	2A40	incf 0x040,f

The address of the instruction following the "CALL" instruction is pushed on the stack, so 0x0204 is pushed on the stack.