ECE 3724 Quiz #4 Solution Fall '05 Reese

You may NOT use a calculator. Assume the following memory/register contents at the beginning of each instruction:

Location	Contents:
0x040	0xFB
0x041	0x2C
0x042	0x35
0x043	0x04

a. (4 pts) In the code below, give the FINAL values of FSR0, FSR1 and the final value of any changed memory locations after the instruction sequence is executed.

```
lfsr    FSR0, 0x40
lfsr    FSR1, 0x42
movff   PREINC0, POSTINC1
```

The LFSR instructions initialize FSR0, FSR1 as: FSR0=0x40, FSR1=0x42

The "movff" instruction does:
FSR0++, *(FSR0) → *(FSR1), FSR1++
so the effect of the movff instruction is:
movff 0x41, 0x42

Final values:
new contents of location 0x042: 0x2C
FSR0 = 0x41, FSR1 = 0x43

b. (2 pts) Convert -25 to an 8-bit two's complement number.

Convert +25 to hex. +25 = 0x19. Subtract +25 from zero to get –25.
0 – (+25) = 0x00 – 0x19 = 0xE7

c. (4 pts) Fill in the blanks below to convert the following C code to PIC18 assembly language.

```
signed char j, k;

while ( k >= j) {
   operation 1...
   operation 2...
  }
```

```
loop_top:
      movf      j,w
      subwf     k,w   ; k - j
      bov       L1   ;branch on V=1
      bnn       loop_body ;TRUE, N=0, V=0
      bra       loop_exit ;FALSE: N=1,V=0
L1
      bnn       loop_exit  ;FALSE, N=0, V=1
     ;;get here, TRUE N=1,V=1, fall thru to loop
     ;; body
loop_body
      ...code for operation 1...
      ...code for operation 2....
loop_exit
      ....rest of code....
```

Comparison is K – J

True Case: N=0 (positive), V=0
or N=1 (neg), V=1

False Case: N=1 (neg), V=0
or N=0 (pos), V=1