ECE 3724/CS 3124 Quiz #3 Spring ‘04 Reese

NAME: _______________________

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

Location	Contents:
0x059	0xA8
0x05A	0x08
0x05B	0xFD
0x05C	0x29

W = 0xC3, STATUS = 0x00

a. (2 pts) rrcf 0x05C, f.

```
location 0x5C contains  0x29 = 0010 1001
           right shift  ------------------→
                     --------------------------
 new value of location 0x5C is 0001 0100 = 0x14
```

b. (2 pts) bcf 0x05B,6

```
                                   7654 3210
location 0x5B contains   0xFD =1111 1101
Bit clear bit #6                    0
                                 -----------
new value of location 0x5B is 1011 1101 = 0xBD
```

c. (3 pts) Fill in the blanks below

```
unsigned char i,k;

do {
    i--;
 } while (i > k);
```

```
loop_top
        decf     i,f
        movf     _i__, w
        subwf    _k__, w      ; do  k – i
        bnc      loop_top     ; if i > k, then k – i causes borrow, clearing
                              ; Carry flag, so branch on no carry to loop top.
        ......rest of code....
```

d. (3 pts) Write the following in PIC18 assembly.

```
char  s,p,q;

s =  (p >> 1) + (q << 1)
```

rewrite this as:
s = p;
s = s >> 1;
w = q << 1;
s = s + w;

```
;;RIGHT ANSWER
    movff p,s       ;s = p
   bcf   STATUS,C    ; clear carry
                     ; before shift
   rrcf  s,f         ;s = p >>1
   bcf   STATUS,C
   rlcf  q,w         ;w = q << 1
   addwf s,w         ;s = w + s
```

Both p, q are changed. This is equivalent to:
p = p >> 1;
q = q << 1;
s = p + q; // original code did NOT change p or q

```
;;A WRONG ANSWER
   bcf   STATUS,C
   rrcf  p,f          ;p = p>>1
   bcf   STATUS,C
   rlcf  q,f          ;q = q << 1
   movf  q,w
   addwf p,f
   movwf s        ;s = p + q
```