# ELE538 — Microprocessor Systems

**Quiz**                                                                 October 12, 2001

**Name:**_____         **User ID:** _____         **Professor:**_____

**Time: 25 minutes**                                   **Closed-book except for 6811 Technical Data**
**Answer all questions**                               **Use this paper for all of your answers**

1. Given a program listing as shown, trace the results (hex value of items being asked) of each program step from *start* to *end*, and the location of address label *fin*. [**4 marks**]

```
        ORG     $6000
data1   FDB     1,3,5,7,9
data2   FCB     2,4,6,8,10
msg     FCC     "ele538"
ans     RMB     2
fin                             ; location of fin=?_____


        ORG     $6100
start   LDS     #$7fff
        LDX     #data2      ; X=?_____
        LDD     1,x         ; AccA=?_____
        ADDD    data1+2     ; AccB=?_____
        PSHX                ;
        MUL                 ; AccB=?_____
        LDAB    msg+4       ; AccB=?_____
        PULB
        PULB                ; D=?_____
        STD     ans
end:    SWI
```

2. Write 6811 code to perform the following bit manipulations on the current contents of accumulator B:

   - set bit_7 and bit_5
   - clear bit_2 and bit_0
   - toggle the rest of bits

   (i.e. if B initially contains $AB (binary: 10101011), then the result in B would be $F0 (binary: 11110000) [**3 marks**]

3. Translate the following pseudo-code into 6811 assembler:

   (Note: PortA is a *write-only* port)

   [**3 marks**]

```
/* Assume PortA is at memory location $2000 */

unsigned char temp;  /* i.e. temp is an 8-bit unsigned variable */

for (temp = 20; temp != 5; temp--)
    PortA = temp;
```