COSC 2410: Practice Midterm Exam

Name: _____

D. Mirkovic, Fall 2003

1. (Numbering systems and data representation) Perform the following conversions and arithmetic operations:

   a) Convert to binary and hexadecimal:
   `127 =` _____B _____h (4)

   b) Convert to decimal:
   `00110100B =` _____ `1Ah =` _____ (4)

   c) Convert to decimal
   `0FEh =` _____ (assume unsigned representation) (4)

   d) Convert to decimal
   `0FEh =` _____ (assume signed 2's complement representation) (4)

   e) Write a hexadecimal 16-bit extension of the following signed 8-bit hexadecimal numbers assuming 2's complement representation.
   `8Ah =` _____ `3Ah =` _____ (4)

2. (Integer arithmetic)

   a) Write assembly code for the statement A = 2*B - 12*D. (Assume signed word variables and the usual order of precedence.)

b) Fill in the contents of the specified registers as four hexadecimal digits, given the specified code segments.

```
mov  ax, 0ffffh ;
inc  ax;          ax = _____    (4)
mov  ax, 0ffffh ;
inc  al;          ax = _____    (4)
mov  ax, 1 ;
neg  ax;          ax = _____    (4)
mov  ax, 1234h ;
sub  al, al;      ax = _____    (4)
mov  ax, 7h ;
add  ax, 3h ;     ax = _____    (4)
```

3. (Control Structures) Translate the following pseudo-code statement into assembly lansuage:

```
if ( X > 0) then SgX = 1 else if (X < 0) then SgX = -1 else SgX = 0.
```

4. (Subroutines) Fill in the values of the specified registers and memory locations after the execution of the following code fragment.

```
A    DW    1111h
B    DW    2222h
       mov       ax, 3333h ;  ax = _____    (4)
       push      A
       push      ax
       push      B
       pop       ax ;         ax = _____    (4)
       pop       B ;          B  = _____    (4)
       mov       bx, 4444h ;
       push      bx
       pop       ax ;         ax = _____    (4)
       pop       bx ;         bx = _____    (4)
```

5. (Arrays and Strings) Let A be array of 100 words. Assume that `ds` and `es` are set to the segment containing A. Write assembly code using string processing instructions to set all entries in A to 0.