40 pts

Name: _____

Class Day / Time: _____

Due Date: _____

Lab #6 – Data Transfers, Addressing and Arithmetic

Use the following variable definitions for the questions in this section 1 and 2:

```
.data
        var1 SBYTE -4,-2,3,1
        var2 WORD 1000h,2000h,3000h,4000h
        var3 SWORD -16,-42
        var4 DWORD 1,2,3,4,5
```

1. For each of the following statements, select whether or not the instruction is valid and if invalid describe why:

a. mov ax,var1 Valid? YES NO If Not Why? _____

b. mov ax,var2 Valid? YES NO If Not Why? _____

c. mov eax,var3 Valid? YES NO If Not Why? _____

d. mov var2,var3 Valid? YES NO If Not Why? _____

e. movzx ax,var2 Valid? YES NO If Not Why? _____

f. movzx var2,al Valid? YES NO If Not Why? _____

g. mov ds,ax Valid? YES NO If Not Why? _____

h. mov ds,1000h Valid? YES NO If Not Why? _____

2. What will be the hexadecimal value of the destination operand *after* each of the following instructions execute in sequence?

```
mov al,var1          ; a. _____
mov ah,[var1+3]      ; b. _____
```

```
mov ax,var2              ; c. _____
mov ax,[var2+4]          ; d. _____
mov ax,var3              ; e. _____
mov ax,[var3-2]          ; f. _____

mov edx,var4             ; g. _____
movzx edx,var2           ; h. _____
mov edx,[var4+4]         ; i. _____
movsx edx,var1           ; j. _____
```

Use the following data for the next several questions:

```
.data
        val1 BYTE 10h
        val2 WORD 8000h
        val3 DWORD 0FFFFh
        val4 WORD 7FFFh
```

3. Write an instruction that increments *val2*

4. Write an instruction that subtracts *val3* from EAX.

5. Write instructions that subtract val4 from val2

6. If val2 is incremented by 1 using the ADD instruction, what will be the values of the Carry and Sign flags?

7. If val4 is incremented by 1 using the ADD instruction, what will be the values of the Over-flow and Sign flags?

8. Where indicated, write down the values of the Carry, Sign, Zero, and Overflow flags *after* each instruction has executed:

```
mov ax,7FF0h

add al,10h          ; a. CF = ____  SF = ____  ZF = ____  OF = ____

add ah,1            ; b. CF = ____  SF = ____  ZF = ____  OF = ____

add ax,2            ; c. CF = ____  SF = ____  ZF = ____  OF = ____
```

Use the following data definitions for the next exercise:

```
.data
        myBytes BYTE 10h,20h,30h,40h
        myWords WORD 3 DUP(?),2000h
        myString BYTE "ABCDE"
```

9. What will be the value of EAX after each of the following instructions execute?

```
mov eax,TYPE myBytes          ; a. _____
mov eax,LENGTHOF myBytes      ; b. _____
mov eax,SIZEOF myBytes        ; c. _____
mov eax,TYPE myWords          ; d. _____
mov eax,LENGTHOF myWords      ; e. _____
mov eax,SIZEOF myWords        ; f. _____
mov eax,SIZEOF myString       ; g. _____
```

10. What will be the final value of EAX in this example?

```
        mov eax,0
        mov ecx,10              ; outer loop counter
L1:
        mov eax,3
        mov ecx,5               ; inner loop counter
L2:
        add eax,5
        loop L2                 ; repeat inner loop
        loop L1                 ; repeat outer loop
```

Final EAX value: _____