(100 pts) CS3843 Computer Organization Exam #3 Name/abc123:_______________
(30 pts) BONUS

Conversions and Binary Math: (10 pts)

1. Given the AX register with 16 bits, what is the largest unsigned value it may have after being logically shifted to the right by 4. "shr ax, 4"

2. Convert 0xF3 to binary.

3. Convert the signed number, 0xC8 to decimal.

4. Convert this signed 8-bit binary number to decimal. 10110111_2

5. What is the signed range of a 24-bit number? You may express as a power of 2.

Stack Operations: (20 pts)

6. (18 pts) Complete the stack frame given the following assembly code**.** Make sure to fill in the stack addresses that are not already complete and any other blank spaces. For full credit, all spaces should be filled.

   Given: **`esp=0x18C00, ebp=0x18C04, eip=0x401A45`**

   Given: **`Call to Func0 ➔ func0( 0xC099, 0xA9C512 );`**

```
Func0:
00401A45 8B 55 0C               mov     edx, [ebp+0Ch]
00401A48 52                     push    edx
00401A49 8B 45 08               mov     eax, [ebp+8]
00401A4C 50                     push    eax
00401A4D E8 4E FF FF FF         call    Func1
00401A52 83 C4 08               add     esp, 8     < -- eip doesn't get here

Func1:
004019A0 55                     push    ebp
004019A1 8B EC                  mov     ebp, esp
004019A3 83 EC 08               sub     esp, 8
004019A6 C7 45 F8 78 A3 51 00   mov     [ebp-8], 51A378h
004019AD C7 45 FC 11 F2 23 4D   mov     [ebp-4], 4D23F211h
004019B4                                           < -- eip stops
```

Address	Value	Description
0x18C00	**00 00 00 00**	Local var in func0
0x18C04	**80 8F 01 00**	Previous ebp
0x18C08	**D3 12 40 00**	Return Address of function calling Func0
---------	**?? ?? ?? ??**	Unknown

7. (2 pts) The instruction at address 0x4019AD adds a -4 to ebp before accessing the memory location specified in the now modified ebp. What tells the CPU that the value to add to ebp is a -4?