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

(50 pts) Part 1

Fast Answer: (30 pts, 2 pts for most)

1. (12 pts) Show the truth tables for the NAND, OR, and Exclusive-OR logic functions.

A_{in}	B_{in}	Out

NAND

A_{in}	B_{in}	Out

OR

A_{in}	B_{in}	Out

Exclusive-OR

2. What type of logic function is used to mask out bits by forcing them to zero?

3. Write an assembly instruction to easily divide register al by 4.

4. What do all the string assembly instructions have in common? (movsb, lodsb, scasd, etc.)

5. The decrement instruction (ex: dec ecx) affects the carry flag (True, False)

6. When debugging inline assembly code, (global, local, heap) variables cannot be accessed if you set up your own stack frame.

7. When exiting an inline function, you must fix the stack and call return in your assembly code. (True, False)

8. Given that register ax contains a signed value, write the assembly instructions to get the 16-bit two's complement without using negate "neg".

9. When passing an object to a function in C, is the entire object pushed to the stack or a pointer to the object?

Brief Discussion: (20 pts)

10. (5 pts) Briefly explain why global variables are better (or not) for debugging inline assembly code.

11. (10 pts) For homework #9, we used an array of pointers for our wordlist. It is the same data type as “char * argv[]” used by main in a C/C++ program. Assume the following declaration is made in C:

```
char *gWordList[] = { “hello”, “huh?”, “apple”, “study”, “party”, “767”, “!YEAH!” };
```

a. How many bytes are used to hold the variable gWordList?

b. How many elements in the array gWordList?

c. Write the assembly instruction(s) to get the address of the word “study”.

d. How many bytes will the compiler use to store the word “party”?

e. What must be done before we could use our binary search algorithm to find a word in this list?

12. (5 pts) Briefly describe a debugging approach you could use to debug inline assembly.