383 Midterm Questions

1) What is the difference between volatile and nonvolatile memory? Is RAM volatile or nonvolatile? Is ROM volatile or nonvolatile?

2) What does ALU stand for? What does CU stand for? What is a register? Be precise. Name several different kinds of values that a register might hold. What is the purpose of the instruction register?

3) Describe the fetch-execute cycle. Explain the importance of a CPU's clock cycle. For example, what would it mean for a CPU to run at 4.77MHZ

4) Explain the advantage in implementing separate fetch and execute units in a CPU. What additional task is implemented in the fetch unit as a performance enhancement measure?

5) Most CPUs today are superscalar. What does that mean?

6) What are the advantages of flash memory over hard disk storage? What are the advantages of hard disk over flash memory storage? What are the advantages of both hard disk and flash memory storage over RAM? What is the major advantage of RAM over other types of storage?

7) When a system has multiple levels of cache memory, L2 always has more memory than L1. Why is this necessary?

8) Suppose that a CPU always executes the two instructions following a branch instruction, regardless of whether the branch is taken or not. Explain how this can eliminate most of the delay resulting from branch dependency in a pipelined CPU. What penalties or restrictions does this impose on the programs that are executed on this machine?

9) In general, what purpose does an interrupt serve? Stated another way, suppose there were no interrupts provided in a computer. What capabilities would be lost?

10) What is the difference between polling and polled interrupt processing?

11) In terms of the nature of the data, how does a keyboard differ from a hard disk as an input device?

12) Although CPU remain the same over the years, various improvements occurred in their architecture. Descried them in details.

13) That's the problem with designing smaller CPU and the Moore's law.

14) Provide the Arduinos Uno specification

15) Write a small program in assembly that calculates the following equation: 2x^2-3+4