Problem 1 (4 points)

a. How many Midterm exams do you have for this course? What are the dates on which they are held?

4 Midterms:
   a. Feb 13, Fri
   b. Mar 13, Fri
   c. Apr 15, Wed
   d. May 6, Wed

b. Do you have a conflict with any of the exams? If so, have you informed Prof. Hill about the conflict?

   If you have, you should have already informed your professor about the conflict.

   No

Problem 2 (3 points)

(This question has no wrong answers.)

a. What is your expected major(s)?
   No wrong answer

b. Have you taken any other Computer Science courses in the past? If yes, please list them.
   No wrong answer

c. What do you hope to learn from this course?
   No wrong answer
Problem 3 (2 points)

“The police shot the man with a gun”?
   a. How many reasonable interpretations can you provide for John’s statement? List them.
   b. What property does this sentence demonstrate that makes it unacceptable as a statement in a program.

Interpretations:
   1. A man who had a gun was shot by the police.
   2. A man was shot by the police using a gun.

Property demonstrated is ambiguity of natural languages.

Problem 4 (4 points)

a. Name at least three things specified by an Instruction Set Architecture (ISA)

   Instructions, Data Types, and Addressing Modes

b. In your own words, explain how does a microarchitecture differ from an ISA? Why do you think we might want to design a different microarchitecture for an existing ISA?

The microarchitecture specifies how circuits are put together to create the computer. The Instruction Set Architecture (ISA) provides an interface which specifies what sort of instructions a computer supporting this interface can perform. We would do this for a number of reasons. Primarily, requirements could be different for different systems. For example, Servers require very high performance, so the microarchitecture should be designed accordingly. Servers do not put a major limitation on cost/power. However other systems like mobile devices require a good performance at low cost, without significant power dissipation. The key to note here is that (other than hopefully an improvement in performance / cost / power) the actual user sees no difference when programming or running the computer.
**Problem 5 (4 points)**

List the levels of transformation and give a brief summary of what each layer signifies.

The levels of transformation include:

a. Problem  
b. Algorithm  
c. Program  
d. Instruction Set Architecture  
e. Microarchitecture  
f. Circuits  
g. Devices

For description, refer slides 1-10 and 1-11 in  

**Problem 6 (4 points)**

List three properties of algorithms and briefly describe them.

a. Definiteness: Each step of a process is clearly laid out  
b. Finiteness: Will not run on forever, will stop at some point  
c. Effective Computability: Determines whether or not a problem is solvable