Homework 3

Due Date: February 15, 2011 **Points:** 100

Questions

1. (*20 points*) Prove Theorem 6–1 for the strict integrity policy of Biba's model. (*text*, problem 6.1)

2. (*15 points*) The relations *certified* (see ER1) and *allowed* (see ER2) can be collapsed into a single relation. Please do so and state the new relation. Why doesn't the Clark-Wilson model do this? (*text*, problem 6.10)

3. (*10 points*) Why must sanitized objects be in a single company dataset in their own conflict of interest class, and not in the company dataset corresponding to the institution producing the sanitized object?

4. (*30 points*) Consider the systems Louie and Dewey in Section 8.2.4.
   (a) Suppose the sends and receives for the buffers are non-blocking. Is the composition of Hughie, Dewey, and Louie still noninterference-secure? Justify your answer.
   (b) Suppose all buffers are unbounded. Is the composition of Hughie, Dewey, and Louie still noninterference-secure? Justify your answer.
   (*text*, problem 8.3)

5. (*25 points*) Suppose the composite machine *catdog* (see Section 8.4.1) emits the same value from the left and the right. Show that it has received an even number of inputs from the left. (*text*, problem 8.7, modified)

Extra Credit

1. (*15 points*) A physician who is addicted to a pain-killing medicine can prescribe the medication for herself. Please show how RBAC in general, and Definition 7–12 specifically, can be used to govern the dispensing of prescription drugs to prevent a physician from prescribing medicine for herself. (*text*, problem 7.7)