Logic final exam (practice problems)

1. Translate the following sentences into predicate logic. Use a relation symbol Lxy for "x loves y," and use the equality symbol $=$ when appropriate. (You don't need a separate predicate symbol for "x is a person.")

   (a) Everyone loves at least two other people.

   (b) Nobody is loved by more than two people.

   (c) Everyone loves all people who love her.

   (d) There is no one who is loved by both Anne and Bente.

   (e) Bente loves nobody but Anne and Cordelia.

   (f) If two people don't love each other, then at least they love all the same people.

2. Provide a model/interpretation to show that these six sentences are consistent. (It would suffice to draw an arrow diagram, or to write a domain set and extensions of the relevant symbols.)

3. Show that Anne and Bente are different people.

4. Show that Anne and Cordelia are different people.

5. Show that Bente and Cordelia are different people.

6. Show that there is somebody else besides Anne, Bente, and Cordelia.

7. Show that if Anne loves a person, then that person loves Cordelia.