1. You are asked to design a database for maintaining information about viewers’ TV watching habits, and also their friend circles (as a social network). Begin with constructing an E/R diagram. Here are the conceptual requirements/domain knowledge, and some simplifying assumptions. [2 pts]

(a) Assume the maintained information is only about past. Don’t worry about storing information about future episodes.

(b) Episode numbers or episode names are not unique across TV Shows.

(c) A viewer watches an *episode* as a whole; ie. she either watches an episode or doesn’t. No partial watching is allowed. Note that she may not watch all episodes of a TV Show.

(d) Assume a single market, and a single airing of each episode. The time at which the episode aired must be maintained.

(e) Obviously a viewer can only watch one show at a time.

(f) Assume simple symmetric friend relationships.

You might want to begin with three entity sets: (1) TV Show, (2) Episode, (3) Viewer.
2. Why is the entity set \textit{Episode} drawn differently than the other two entity sets? [1 pts]

3. Chapter 6.3.3 discusses what are called \textit{participatory} constraints. Write down a relationship in the above E/R diagram where you might want to add such a constraint. [1 pts]

4. Discuss how you might want to specialize (Chapter 6.7.1) the TVShow entity set from above. What are the advantages of this specialization? [1 pts]

5. Some conceptual models are not rich enough to model certain domain knowledge. It is not obvious how to model Assumption (e) from above in the E/R model (at least using the constructs discussed so far). Can it be done? Can you give an argument as to why or why not? [1 pts]

6. What are the disadvantages of not being able to model such a constraint or such a piece of domain knowledge in the conceptual model? [1 pts]
7. Identify one or two other pieces of domain knowledge for this application that might most often be true, but would be hard to model with the constructs we have seen so far. [1 pts]

8. I want to recommend new shows to viewers based on both what they have watched, and what others have watched. Describe some ways you might want to use the friend circle for this purpose. Try to be specific in your suggestions. [1 pts]

9. Define the concept of aggregation (Chapter 6.7.5). Give an example of where this might be useful. You can use any example other than the one presented in Chapter 6.7.5. If you want to do this for the TiVo application above, consider modeling TV Channel information, and modeling the fact that different viewers may watch the same episode on different channels (or otherwise consider re-runs). [2 pts]
10. Convert the above E/R diagram into a relational schema. Underline primary keys. [2 pts]

How much time (approximately) did you need to finish this exam? Please be honest; this won’t affect your grade in absolutely any way. ________