1. Use the following blank page to draw an ER diagram representing the following enterprise. Consider a collection of Quests and Items. Quests have an autogenerated id, a name, and a location consisting of a region, a zone and a coordinate. Quests must reward items, and can reward multiples of the same item or different items. Quests have a difficulty level defined as the total value of all items rewarded divided by 10. Quests can be repeatable. A repeatable request has an extra field of delay, which is the amount of time between the completion of a Quest and the next time it can be started. A non-repeatable Quest may require both different items and multiples of an item in order to be completed. A Quest may not be both repeatable and not repeatable. Items have an autogenerated id, a name, a value and a set of skills to improve. The improvements consist of the name of the skill and the amount of the improvement. There are three types of items – items required for quests, items rewarded by quests and general items. General items are items that are not involved with quests (e.g., items that can be bought in stores). Items can be both rewards for one quest and required for another quest. It is also possible for a reward to not be associated with a quest, and they can be rewarded by at most one quest. Items may only be required by exactly one quest.
Draw your ER diagram here.
2. Let $R = (A, B, C, D, E)$. Let the set of functional dependencies that hold on $R$ be $F = \{AB \rightarrow DE, A \rightarrow CD, D \rightarrow B\}$. Find the canonical cover for $F$.

3. Let $R = (A, B, C, D, E)$. Let the set of functional dependencies that hold on $R$ be $F = \{AB \rightarrow DE, A \rightarrow CD, D \rightarrow B\}$. Find all candidate keys for $R$. 


4. Let $R = (A, B, C, D, E)$. Let the set of functional dependencies that hold on $R$ be $F = \{AB \rightarrow DE, A \rightarrow CD, D \rightarrow B\}$. Using the algorithm in class and the text, find a 3NFLJDP decomposition. Based on the conditions discussed in class, what is the highest normal form of your decomposition?

5. Let $R = (A, B, C, D, E)$. Let the set of functional dependencies that hold on $R$ be $F = \{A \rightarrow C, AD \rightarrow B, D \rightarrow E, B \rightarrow AD\}$. Using the algorithm in class and the text, find a BCNFLJ decomposition. What is the highest normal form of your decomposition?
6. What are the characters used to indicate the start of PHP code in an HTML file? (3)

7. For a little while, unicorns had invaded LampQuest due to an HTML formatted login names. What is this type of attack called? (3)

8. What is a dictionary attack? (4)
Figure 1: Consider the following ER diagram. Answer the questions on the following page.

Notes: The difficulty of a Quest is equal to the sum of the value of the items rewarded divided by 10.
9. (a) List the tables needed to represent the enterprise modeled in this diagram. Include the primary key of the table.

(b) Provide the SQL to create the table associated with the Requirements entity set. You may use any reasonable type for the attributes.