1. (6) Give examples of relations that are in the following normal forms (one each) and briefly explain your answers:

a. Not in 1NF

b. In 1NF but not 2NF

c. In 2NF but not 3NF
2. (12) Briefly define each of the following terms in the context of this course.

   a. BLOB

   b. Composite key

   c. Page footer

   d. Cursor

   e. ODBC

   f. Data clustering
3. (24) Consider the attached description of a possible furniture store application.

a. Draw a class diagram to represent the information required to implement this application.

b. Show the normalized relations that would be used to hold this information.
c. Explain how pictures of the furniture and fabrics might be included in this database.

d. Write SQL statements to actually create the tables. Do not include the pictures.
4. (30) Write SQL queries for Sally’s Pet Store for the following requests. A copy of the database schema is attached.

a. List all information in the animal table sorted (in alphabetical order) first by category (primary sort key) and then by breed (secondary sort key)

b. List the different categories available and the number of animals in each category.

c. Give read access to the animal table to everyone.

d. Which animals do not have a Web photo (image file)? List the AnimalID, name, and category; exclude all fish.

e. List the names of customers who have bought both animals and merchandise.

f. List the names of customers who have bought animals but not merchandise.
5. (20) Compare and contrast the following pairs:

a. OLTP vs. OLAP

b. base tables vs. views

c. forms vs. reports

d. B+ trees vs. hash files
6. (8) Give one measure that could be used to defend against each of the following potential security threats.

a. The disk drive with the database on it fails, and all its data is lost.

b. Data entry clerks keep mistyping the item codes in orders.

c. Someone on the Internet acquires a password for one of your salespeople by monitoring Internet traffic.

d. A purchasing department employee creates fake supplier accounts and redirects payments to a personal account.