Question 1

Use the following six tables to answer all questions in this section. The primary keys are underlined. The foreign keys have the same name as the primary key in another table. Assume that contactID is a reference to another customer (the customer_id of another customer).

Manufacturer(manufacturer_id, manufacturer_name)
Makes(manufacturer_id, clothing_id)
Clothing(clothing_id, gender, item_name, price)
Customer(customer_id, name, phone, city, contact_id)
Transaction(transaction_id, customer_id, transaction_date)
Transaction_Item(transaction_id, clothing_id, quantity, condition)

Write relational algebra commands to do the following tasks.

1. Output the name, and phone for all customers who live in Albany.
2. Output the average price of all clothing.
3. Output the average price of all ‘Male’ clothing and all ‘Female’ clothing.
4. Output the customer name, phone, city, and transaction date for all transactions.
5. Output the transaction_id, clothing_id, condition, item_name, quantity, and price for all transactions on February 24, 2012.
6. For all customers, output the name of the customer and the sum of all costs for all their transactions.
7. Output the names of all customers and the name of their contact.
8. Output the name of all manufacturers who make every clothing item.
Question 2

Draw an E-R diagram to model the following situation. You must either use ER Assistant or the symbols used in the textbook.

You are creating a social-networking site that keeps track of the books that its members read.

- You keep track of the email, name, and password of your customers.
- You keep track of the title, genre, and author of all books. Assume that titles are not unique.
- For each author, we keep track of their name, date of birth, gender, and nationality. An author can write many books, but each book has just one author.
- A customer can read many books, and a book could be read by many customers. We only keep track of books that some customer has read.
- It’s possible that a customer may not have told us about any of the books they have read.
- A customer can give a book a ranking.
- A customer can write a review of a book. A review will have a date and the text of the review.
- A customer can designate other customers as their friends. A customer can have many friends, and each customer can be friends to many others.
Question 3

Let’s start with the following ER diagram:

Assume that there are actually two kinds of athletes – basketball players and soccer players. For basketball players, we keep track of points per game and rebounds per game. For soccer players, we keep track of goals scored. For soccer goalies, we keep track of average goals allowed.

An athlete cannot be both a basketball player and a soccer player; but they could play a sport other than these.

Assume that there are actually three types of teams – basketball teams, soccer teams, and other teams. For a basketball team, we keep track of NBA championships won. For a soccer team, we keep track of their league and the number of Champions League titles they have. For other teams, we keep track of their sport.

Basketball players only play for basketball teams and soccer players only play for soccer teams.

Create an EER diagram for this. You must either use ER Assistant or the symbols used in the textbook.
Question 4.

Map the following EER diagram into a set of relations: