Exam 2

Sample
Problem 1, 10 Points

List the various normal forms. What is desirable about putting a database into a collection of high normal form relations?
Problem 2, 22 Points

AutoCAD, a design package, has just output a series of records in the following format:

Panel_no  Panel_loc  Panel_desc  Device_no  Dev_name  Wire_no  Voltage

Each electrical panel is identified by Panel_no, is placed in a single location (Panel_loc), has a description (Panel_desc), and contains many devices. Each device is identified by Device_no, has a single device name (Dev_name), and many wires connected to it. Each wire is identified by Wire_no, can connect to many devices, but has the same wire number at every point of connection. Each wire has a single associated voltage.

Normalize these records into a set of relations in 5NF.
Problem 3, 18 Points

We have been asked to design a database for the new Campus Cards greeting card project. Student card text authors team up with student card visual authors to develop a greeting card. Sales representatives then visit college bookstores to get the bookstores to carry the line of greeting cards. Bookstores then sell the greeting cards.

We have identified authors, cards, sales representatives, and bookstores as entities worth describing.

Authors have a name, phone number, and mail number. Salesreps have a name, phone number, and address. Bookstores have a name, phone number, and address. Cards have a card number and theme (birthday, wedding, etc.).

Since the same students tend to be both text authors and visual authors, often for many cards, we wish to keep student authors in a single relation. Each card has only one text author, and only one visual author, each of whom get a commission on the sale of each card. Each bookstore has a unique sales representative, who also gets a commission on the sale of each card from each bookstore. There is no restriction on which cards can be sold in which bookstores.

Draw an LDS to represent this situation.
Problem 4, 10 Points

Map the LDS above (from problem 3) into a set of 5NF relations.
Problem 5, 18 Points

Map the LDS below into a set of 5NF relations.
Problem 6, 16 Points

a. Write an SQL statement to build the following base table for a transportation database:

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sign(size,shape,message,cost,installed)
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where size is sign width in inches to nearest .01"; shape is at most 8 characters; message is at most 100 characters; cost is in dollars and cents; installed is any legal date.

b. Write an SQL statement to allow the people in the traffic department to see only the first three fields.

c. Write an SQL statement to change all the stop signs to be octagon in shape.

d. Write an SQL statement to list the messages on all square signs larger than 11 inches wide.
Problem 7, 6 Points

The following two tables have been created:

emp(name, dob, mgr, rate, dnum)

dep(dnum, loc, budget)

where name is the employee name, dob is the employee date of birth, mgr is the employee name of the employee's manager, rate is the employee pay rate, and dnum is the department number of the employee; dnum is the department number, loc is the department location, and budget is the department budget.

Write an SQL statement to print out all employees, their department numbers, and their department's location.