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First Semester M.Tech. Degree Examination, May/June 2010
Database Management Systems

Time: 3 hrs.

Max. Marks:100

Note: Answer any FIVE full questions.

- 1
 - a. Explain any five advantages of using the DBMS approach. (10 Marks)
 - b. Briefly explain the various DBMS languages. (08 Marks)
 - c. Define the data independence. (02 Marks)

- 2
 - a. A bank has many branches and a large number of customers. A customer can open different kinds of accounts with the bank. The bank keeps track of a customer by his SSN, name, address and phone number. Age is used as a factor to check whether he is a major. There are different types of loans, each identified by a loan number. A customer can take out more than one type of loan and all branches can give loans. Loans have a duration and an interest rate. The account holder can enquire about the balance in his account. Draw an ER diagram for the bank. Make suitable assumptions and use them to show maximum and minimum cardinality ratios. (10 Marks)
 - b. When is the concept of a weak entity used in data modeling? Define the terms: owner entity type, weak entity type, identifying relationship type and partial key. (10 Marks)

- 3
 - a. Discuss the characteristics of relations. (08 Marks)
 - b. Consider the following relations for a database that keeps track of business trips of salespersons in a sales office.
 SALESPERSON (Ssn, Name, Start_year, Dept_no)
 TRIP (Ssn, From_city, To_city, Departure_date, Return_date, Trip_id)
 EXPENSE (Trip_id, Account#, Amount)
 Specify the foreign keys for this schema, stating the assumptions. (06 Marks)
 - c. Discuss entity integrity and referential integrity constraints. (06 Marks)

- 4
 - a. For the database schema in Question 3(b), specify the following queries in relational algebra.
 - i) Give the details (all attributes of trip relation) for trips that exceeded \$5000 in expenses.
 - ii) Print the SSN of the salesman who made trips to San Francisco.
 - iii) Print the total trip expenses incurred by the salesman with the SSN='234-56-7890'. (12 Marks)
 - b. Explain the additional features of SQL. (08 Marks)

- 5
 - a. What are the approaches to database programming? Explain their advantages and disadvantages. (10 Marks)
 - b. What is the impedance mismatch problem? Which of the programming languages minimize this problem? (10 Marks)

- 6
 - a. Explain the Armstrong's inference rules. (06 Marks)
 - b. Discuss the purpose of BCNF and describe how it differs from and is stronger than 3NF. Illustrate your answer, with an example. (10 Marks)
 - c. What are the advantages of normalization? (04 Marks)

- 7
 - a. Describe strict 2PL. (08 Marks)
 - b. What is the phantom problem? Can it occur in a database where the set of database objects is fixed and only the values of objects can be changed? (06 Marks)
 - c. Discuss the fuzzy check point, in brief. (06 Marks)

- 8

Write short notes on:

 - a. Schema evolution
 - b. Views in SQL
 - c. 3-Tier architecture
 - d. Aries

(20 Marks)