Computer Science and Engineering

National Institute of Technology, Hamirpur

End Semester Examination

Subject: CS-312   Class: B.Tech(CSE) 5th Sem(CS3)
Database Management System   Maximum Marks: 50
                                        Time: 3 hours

1. Consider the following relations: (15)

   branch (branch_name, branch_city, assets)
   customer (customer_name, customer_street, customer_city)
   account (account_number, branch_name, balance)
   loan (loan_number, branch_name, amount)
   depositor (customer_name, account_number)
   borrower (customer_name, loan_number)

   Write **SQL** and **relational algebra expressions** for the following queries:

   A. Find all customers who have an account at all branches located in Brooklyn city.
   B. Insert information in the database specifying that Smith has Rs.1200 in account A-973 at the "Perryridge" branch.
   C. Find the name of all customers who have a loan at the bank and the loan amount.

2. A database is being constructed to keep track of the teams and games of a sports league. A team has a number of players, not all of whom participate in each game. It is desired to keep track of the players participating in each game for each team, the positions they played in that game, and the result of the game. Design an ER schema diagram for this application, stating any assumptions you make. Choose your favourite sport (soccer, football, baseball, ...).   (5)

3. The **grant** statement is used to confer authorization. The **revoke** statement is used to revoke authorization. With the help of suitable example explain how privileges can be granted and revoked. Write a short note on privileges in SQL.   (5)

4. Explain how Locking can be implemented with the help of a lock manager. Briefly explain two phase locking protocol?   (5)

5. With the help of suitable schedule explain deadlock? Briefly explain Wait-die and Wound-wait scheme for deadlock prevention?   (5)

6. What are logs and how are Logs maintained by DBMS? Explain deferred database modification Log based recovery scheme?   (5)

7. Write short notes on the following: (10)
   A. Distributed Databases.
   B. Classification of failures.
   C. BCNF.
   D. 3NF.