Advanced Diploma in Information Technology (ADIT) / Bachelor in Information Technology (BIT)

Term-End Examination

June, 2007

CST-203 : RELATIONAL DATABASE MANAGEMENT SYSTEMS

Time : 2 Hours   *Maximum Marks : 50*

Note :   *There are **two** sections in this paper. Section A consists of objective type questions and short answer type questions. All questions in Section A are **compulsory**. Section A carries 26 marks. Section B consists of three questions. Attempt any **two** questions from Section B. Section B carries 24 marks.*

SECTION A

1.   There are 10 objective type questions. There are four choices for each question. Select the best answer. If you feel that none of the given choices is correct, then mark '0' as your answer. Each question carries 1 mark.   *1×10=10*

   (i)   A Candidate Key

   (a)   must be a super key

   (b)   need not be a super key

   (c)   must be a primary key

   (d)   None of the above

   (ii)   Derived attributes are

   (a)   stored in the database

   (b)   can be derived from stored attributes

   (c)   may be derivable from stored attributes

   (d)   None of the above

(iii) Tuples in a relation

    (a)   must be in ascending order of primary key

    (b)   can be in any order

    (c)   must be in descending order of primary key

    (d)   can be repeated

(iv) Basic two phase locking has the problem of

    (a)   Possibility of deadlock

    (b)   Possible lack of durability

    (c)   Possible lack of atomicity

    (d)   None of the above

(v) The select operation slices a tuple based on

    (a)   Attributes

    (b)   Domain of attributes

    (c)   Super key

    (d)   Tuples

(vi) The disadvantage of a fully connected network is

    (a)   Network partitioning can occur easily

    (b)   Vulnerable to failure of one link

    (c)   Highly expensive

    (d)   Vulnerable to failure of one node

(vii) Which of these file organisations is the simplest ?

    (a)   Sequential

    (b)   Index sequential

    (c)   Heap

    (d)   None of the above

(viii) An unrepeatable read is

    (a)   updating a value updated by another transaction

    (b)   reading an uncommitted read

    (c)   reading a committed read

    (d)   None of the above

(ix) The unit of recovery is a

    (a)   tuple

    (b)   relation

    (c)   index

    (d)   transaction

(x) Which set operation is *not* commutative ?

    (a)   Union

    (b)   Intersection

    (c)   Difference

    (d)   None of the above

2.   (a)   Write down any three limitations of File systems.

    (b)   Define a weak entity.

    (c)   List the conditions for a relation to be in 1NF.

3. Define three differences between the following :

(i) Delete and Insert anomaly

(ii) Database security and integrity

(iii) Natural join and Theta join

SECTION B

*There are three questions in this section. Attempt any **two**. This section carries 24 marks. Please give to the point answers.*

4. (a) Consider a Conference Room Reservation System for a company with employees, departments, time slots, purpose of reservation and priorities. Employees or departments can reserve the conference room for different purposes for various time periods and priorities can be assigned. Draw an E-R diagram for this system. Mention clearly the entities and relationships with reasons. Make and mention any necessary assumptions.

(b) What are the four basic properties of a database transaction ? Describe each briefly.

5. (a) Consider an inventory system with items that have a code, name and quantity in stock. There are suppliers that may sell one or more items. Employees belong to a department and can have items issued to them or the department. Identify the functional dependencies, candidate keys and integrity constraints for the database. Design normalised relations for the system. Make and state any needed assumptions.

(b) What are the different types of authorisations that can be set in a relational database management system ?

6. (a) Describe with examples the major facilities provided by the Data Definition Language in a Relational Database Management System.

(b) What are sequences and how are they useful ? What is the significance of gaps in sequences ?