CHAROTAR UNIVERSITY OF SCIENCE AND TECHNOLOGY

Third Semester of B.Tech. (CE/IT) Examination
November 2010

IT201 Database Management

Date: 01.12.10, Wednesday   **Time: 10:30 a.m. to 1:30 p.m.**   **Maximum Marks: 70**

Instructions:
1. Figure to the right indicates full marks
2. Make suitable assumption whenever necessary and mention it clearly
3. Parts of same question should be answered together and in the same sequence.
4. Answers to the sections must be written separately

SECTION – I

Q1

(a) Why keys are important in relational model? Write about candidate keys, primary keys, **5**
alternate key and foreign key.

(b) State true or false with justification: **3**
    i) Unique index can occur only one per table in database.
    ii) Database design is the process of determining an appropriate database   structure to
        satisfy a given set of requirements.
    iii) The inner join is same as the natural join.

(c) What is a Relation Schema and a Relation? **2**

(d) What command is used to create a table by copying the structure of another table? **1**

Q2

(a) Differentiate following with appropriate example **6**
    i) Specialization and Generalization
    ii) Total and Partial Participation

(b) Explain the purpose and utility of different normal forms. Specifically define and differentiate **4**
between third normal form and BCNF.

(c) What is NULL value? When do we need to use NULL values? Illustrate your answer by **2**
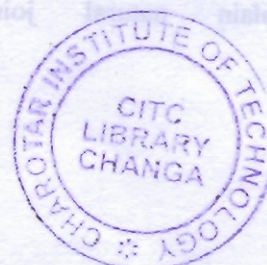example.

OR

Q2

(a) A hospital maintain data about the following entities: **6**
(i) Patients, entity set with attributes SSNo, LastName, FirstName, HomePhone, Sex,
DateofBirth, Age, Street, City, State, Zip
(ii) Doctors, entity set with attributes SSNo, LastName, FirstName, OfficePhone, Pager,
Specialty
(iii) Beds, entity set with attributes RoomNumber, BedNumber, Type, Status, PricePerHour
(iv) Accounts, entity set with attributes DateIn, DateOut, Amount
Construct an E-R diagram for the Hospital Management; specify keys, mapping cardinalities,
participation constraints (if necessary).

(b) Explain entity and integrity constraints with an example. **3**

(c) What is RDBMS? Mention advantages of the RDBMS. **3**

Q3

(a) Consider the following relational database **FOR REFERENCE** **9**
        Employee (person-name, street, city)
        Works (person-name, company-name, salary)
        Company (company-name, city)
        Manages (person-name, manager-name)
Specify the following queries in relational algebra and in SQL

(i) Find the names of all employees who live in the same city and on the same street as do their managers.

(ii) Find the names of all employees in this database who don not work for first bank corporation.

(iii) Find the names for all employees who earn more than every employee of small bank corporation.

(b) With following set of functional dependencies   **3**

$\{A \rightarrow BC, B \rightarrow E, CD \rightarrow EF\}$

Show that FD $AD \rightarrow F$ for R is exists.

OR

Q3

(a) Consider the following relational database   **6**

    Movie(mid, movie_name, shutting_place)

    Actor(aid, actor_name, city)

    Acted(aid.mid,pid)

Specify the following queries in relational algebra and in SQL

(i) Get the actor details who has acted in all the movies.

(ii) Get the pair of movies shutted at the same place.

(iii) Get the actor details who have not acted in any movie shutted at 'Scotland'.

(b) Consider the relation R (A, B, C, D, E) with following set of functional dependencies-   **4**

$\{A \rightarrow BC, CD \rightarrow E, B \rightarrow D, E \rightarrow A\}$

List the candidate keys for R.

(c) What is the difference between a HAVING CLAUSE and a WHERE CLAUSE?   **2**

SECTION – II

Q4

(a) How locking can be used to solve concurrency problem? Explain with example.   **4**

(b) Explain steps involved in query processing.   **4**

(c) Transaction can not be nested inside one another. Why not? Explain.   **3**

Q5

(a) State the two phase commit protocol and discuss the implications of a failure on the part of (a) the coordinator (b) a participant, during each of the two phases.   **5**

(b) Explain the following terms   **5**

    (i) Deadlock   (iii) Abstract syntax tree   (v) NVL()

    (ii) Catalog   (iv) Intent Lock

(c) Explain the functions of database administrator.   **2**

OR

Q5

(a) Explain divide and conquer strategy with example.   **5**

(b) Explain the difference between external, internal and conceptual schemas. How these different layers are related to the concepts of logical and physical data independence.   **5**

(c) Explain any two number functions (single-row function)   **2**

Q6 Answer the following questions (Any Four)   **12**

1) Explain in brief ACID properties of a database transaction.

2) What is "pushing selections and projections" during query optimization? Explain with examples.

3) Explain ANSI/SPARC architecture of Database system with diagram.

4) Write on System recovery.

5) Differentiate between column level and table level constraints.

6) Explain natural join, theta join and self-join using examples.