Code: IT3T5

II B.Tech - I Semester – Regular Examinations - January 2014

DATA BASE MANAGEMENT SYSTEMS
(INFORMATION TECHNOLOGY)

Duration: 3 hours   Marks: 5x14=70

Answer any FIVE questions.   All questions carry equal marks

1. a) What is a database? Explain the terms entity and
   relationship with an example.   **7 M**

   b) Explain the three schemas in a DBMS.   **7 M**

2. a) Define the following terms: relation schema, relational
   database schema, domain, attribute, attribute domain,
   relation instance, relation cardinality, and relation degree.
                                                     7 M

   b) Answer each of the following questions briefly. The
   questions are based on the following relational schema:
   Emp(eid: integer, ename: string, age: integer, salary: real)
   Works(eid: integer, did: integer, pcttime: integer)
   Dept(did: integer, dname: string, budget: real, managerid:
   integer)   **7 M**
       i) Give an example of a foreign key constraint that
         involves the Dept relation. What are the options for
         enforcing this constraint when a user attempts to
         delete a Dept tuple?

ii) Write the SQL statements required to create the preceding relations, including appropriate versions of all primary and foreign key integrity constraints.

iii) Define the Dept relation in SQL so that every department is guaranteed to have a manager.

3. a) Explain Selection and Projection operators with an example.   6 M

b) Consider the following schema: 8 M

Suppliers(sid: integer, sname: string, address: string)
Parts(pid: integer, pname: string, color: string)
Catalog(sid: integer, pid: integer, cost: real)

The key fields are underlined, and the domain of each field is listed after the field name. The Catalog relation lists the prices charged for parts by Suppliers. Write the following queries in domain relational calculus:

i) Find the names of suppliers who supply some red part.

ii) Find the sids of suppliers who supply some red or green part.

iii) Find the sids of suppliers who supply some red part or are at 221 Packer Street.

iv) Find the sids of suppliers who supply some red part and some green part.

4. a) What is a foreign key constraint? Why are such constraints important? What is referential integrity?   7 M

b) Explain the concept of weak entity set with an example.

7 M

5. a) What are functional dependencies? How are primary keys related to functional dependencies? 7 M

b) Give a set of FDs for the relation schema R(A,B,C,D) with primary key AB under which R is in 1NF but not in 2NF.

7 M

6. a) Explain what a RAID system is and how it improves performance and reliability. 7 M

b) What is the order of a B+ tree? Describe the format of nodes in a B+ tree. Why are nodes at the leaf level linked?

7 M

7. a) Define these terms: atomicity, consistency, isolation, durability, schedule, blind write, dirty read and unrepeatable read. 7 M

b) In optimistic concurrency control, no locks are set and transactions read and modify data objects in a private workspace. How are conflicts between transactions detected and resolved in this approach. 7 M

8. a) What are the main principles behind ARIES recovery algorithm?   7 M

   b) What is write ahead logging? What is forced to disk at the time a transaction commits?   7 M