(Following Paper ID and Roll No. to be filled in your Answer Book)

PAPER ID : 0111   **Roll No.** ☐☐☐☐☐☐☐☐☐☐

B.Tech.

(SEMESTER-IV) THEORY EXAMINATION, 2011-12

DATABASE MANAGEMENT SYSTEMS

Time : 3 Hours]   *[Total Marks : 100*

Note :   Attempt **all** Sections.

Section – A

1. Attempt **all** parts.   **10 × 2 = 20**

    (a)   Explain the features of DBMS.

    (b)   Describe data redundancy.

    (c)   Why are entity integrity and referential integrity important in a database ?

    (d)   What is weak entity set and how it is represented in E-R Diagram ?

    (e)   Discuss the importance of concurrency control.

    (f)   Write the advantages of distributed database.

    (g)   Discuss the advantage of two phase locking protocol.

    (h)   Explain various states of transactions.

    (i)   Distinguish between primary key, candidate key and superkey.

    (j)   Distinguish between functional dependency and multivalued dependency.

Section – B

2. Attempt any **three** parts :   **3 × 10 = 30**

    (a)   Create an E-R diagram for university registrar office. The office maintains data about each class, each instructor teaching the class, number of students enrolled, number of subjects for each class, and the time and date of class held. For each student – subject pair, a grade is also recorded. Take suitable assumptions if required.

    (b)   For a relation R(A, B, C, D, E, F) the set of FDS given as follows :

    F = {AB → C, C → A, BC → D, ACD → B, BE → C, CE → FA, CF → BD, D → E)

    Find a non-redundant cover for F. Is this the only non redundant cover ? Find the Canonical cover. Find the candidate key of relation R.

(c) Specify the following queries in SQL based on given schema :

Suppliers(sid, sname, city)

Part(pid, pname, color)

Sp(sid, pid, quantity)

(i) Get the names of suppliers whose name begins with R

(ii) Get pairs of supplier numbers that both operate from same city.

(iii) Get the names of suppliers who supply part P2.

(iv) Get the supplier id and names of suppliers in descending order of city.

(v) Get the part numbers and total quantity supplied.

(d) Describe serializable schedule. Discuss conflict serializability with suitable example.

(e) What do you understand by timestamp based protocol ? Discuss multi-version scheme also.

Section – C

Attempt **all** questions from this section.

3. Attempt any **two** parts :   2 × 5 = 10

   (a) Define data redundancy and consistency.

   (b) Differentiate between file system and database systems.

   (c) Explain three-level architecture of DBMS.

4. Attempt any **two** parts :   2 × 5 = 10

   (a) What is relational algebra ? Discuss how it differs from relational calculus ?

   (b) What do you understand by trigger ? Explain with suitable example.

   (c) Explain external join. How is it different from natural join ?

5. Attempt any **two** parts :   2 × 5 = 10

   (a) Describe Armstrong's axioms.

   (b) What is normalization of data ? Why is it required ?

   (c) Why BCNF is more desirable than 3NF ?

6. Attempt any **one** part :   1 × 10 = 10

   (a) Discuss the problem of deadlock, livelock and starvation. Also discuss the approaches to deal with these problems.

   (b) Discuss the deferred update technique of recovery. What is main advantage of this technique ? Why is it called the NOUNDO/REDO method ?

7. Attempt any **two** parts :   2 × 5 = 10

   (a) Explain ACID properties.

   (b) Discuss the advantage of validation based protocol in concurrency control.

   (c) How the locking is performed in multiple granularity case ?