09759

MCA (Revised)

Term-End Examination

June, 2014

MCS-043 : ADVANCED DATABASE MANAGEMENT SYSTEMS

Time : 3 hours   *Maximum Marks : 100*

Note : *Question number 1 is* **compulsory.** *Answer* **any three** *questions from the rest.*

1. (a) Explain lossless decomposition and **10** dependency preserving. Consider the following relational scheme :

   R (A, B, C, D, E, F) and FDs

   $A \rightarrow BC$, $C \rightarrow A$, $D \rightarrow E$, $F \rightarrow A$, $E \rightarrow D$

   Is the decomposition of R into R_1 (A, C, D), R_2 (B, C, D) and R_3 (E, F, D) lossless and dependency preserving.

   (b) What is meant by a schedule in the context **10** of concurrent transactions in Database ? Also explain serial and serializable schedules with the help of a suitable example.

   (c) Define locking in concurrency control. **10** Discuss the various types of locking techniques.

   (d) How does Boyce-codd Normal form differ **10** from 3NF ? Why is it considered stronger than 3NF, explain using a suitable example.

2. (a) Discuss the five basic operations of relational algebra with suitable example for each. **10**

(b) Describe the architecture of distributed databases with the help of a diagram. **10**

3. (a) Consider the following scheme for project database :

Project (PR_NO, PR_Name, PR_Manager)

Employee (Emp_NO, Emp_Name)

Assigned_To (PR_NO, Emp_No)

(i) Write the DDL statements for the Project Database. Clearly specify the primary and foreign keys. **4**

(ii) Write the following queries in SQL :

• List the details of employees working on PR_NO "A34" and "B64". **3x2=6**

• Delete the record of employee whose Emp_No is "E64221".

• List the name of employees who are working on a project for which "Ramesh" is a Project Manager.

(b) Define weak entity set in ER diagram. How are keys of the weak entities identified ? Discuss the mapping of strong entity set and weak entity set into relations. **10**

4. (a) Describe the term MVD (Multi-Valued Dependency) and JD (Join Dependency) in the context of relational DBMS by giving an example. Also, differentiate between 4 NF and 5 NF with an example. **10**

(b) How are data marts different from data   **4**
     warehouse ? Explain the different types of
     data marts.

(c) Explain, Business Intelligence in context of **6**
     Data warehousing.

5.   Explain the following with the help of examples
     or illustration.   **4x5=20**

(a) Postgres SQL

(b) Deadlock Recovery

(c) Semantic Query Optimization

(d) Spatial and Multimedia Databases

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