MCA (Revised)

Term-End Examination

June, 2008

MCS-023 : DATABASE MANAGEMENT SYSTEMS

Time : 3 hours

Maximum Marks : 100
(Weightage 75%)

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

1. (a) Take a single example of a database and explain the relationships between primary key, candidate key, foreign keys and partial key on the same example. Why is foreign key named like it ? **8**

   (b) Differentiate between the following with example :

   $4 \times 3 = 12$

   (i) DBMS and Database System

   (ii) SQL and SQL PLUS

   (iii) Creating a Report using the Wizard and using Design view

   (iv) Test Plan and Test Cases

   (c) Consider the following relation :

   Car_sale (car#, date_sold, salesman#, commission%, discount_amt)

Assume that the car may be sold by multiple salesman and {car#, salesman#} is the primary key. And additional dependencies are

date_sold → discount_amt

salesman# → commission%

Is this relation in 1NF, 2NF or 3NF ? How should you normalise it completely ?   12

(d) What do you mean by E.R. diagrams ? Design E.R. diagram for a Bank database schema for the following statement :
"Each bank can have multiple branches and each branch can have multiple accounts and loans."   4

(e) Give an example where closure of attributes is used to find the key of relation.   4

2. (a) (i) Can we use Binary Search Tree (BST) as Indexes ? Justify it.

    (ii) If it is used, what are the problems we face ? What will be the solution for it ?   5+5=10

(b) Write query (SQL) for the given statement. Find the sum of the salaries of all employees, the maximum salary, the minimum salary and the average salary of relational schema of employee.

      employee (Name, Employee_id, Salary)   5

(c) What do you mean by ALTER TABLE command ? Write its syntax in all possible situations where it is used.   5

3. (a) What do you mean by 2 phase locking ? Why is 2 phase locking needed ? Justify it with taking an example.   10

(b) Convert the ER diagram of Question 1(d) into relational model i.e. tables.   10

4. (a) Explain 3-tier Client Server Architecture. How is it different from 2-tier Client Server Architecture ? Explain it with an example.   10

(b) Explain briefly the role of data independence in RDBMS. How does RDBMS's data independence make it stronger than file systems ?   10

5. (a) What is the importance of normalisation in RDBMS ? How does normalisation based on functional dependencies improve the database ? Why do we go for denormalisation sometimes ?   10

(b) How would you normalize EMP_DEPT into 3NF

EMP_DEPT (ENAME, SSN, BDATE, ADDRESS, DNUMBER, DNAME, DMGRSSN)

where following dependencies are given :

SSN → {ENAME, BDATE, ADDRESS, DNUMBER}

DNUMBER → {DNAME, DMGRSSN}   5

(c) Explain different types of distributed database management systems {DDBMS}.   5