MCA (Revised)

Term-End Examination   02204
June, 2013

MCS-023 : DATABASE MANAGEMENT SYSTEMS

Time : 3 hours   *Maximum Marks : 100*
                                   (Weightage 75%)

Note :   Question No. 1 is compulsory. Attempt any three questions from the rest.

1.   (a)   Discuss the difference between database   5
           systems and file Based systems.

     (b)   Explain the GROUPBY clause. What is the   6
           difference between the WHERE and
           HAVING clause in SQL ?

     (c)   Define foreign key. Explain its significance.   4

     (d)   Is BCNF stronger than SNF ? Justify your   5
           answer with the help of an example.

     (e)   Discuss the different process of   6
           authorisation permitted on database items
           with the help of examples ?

     (f)   Define Data Independence ? Explain the   5
           difference between physical and logical data
           independence.

(g) List all the functional dependencies that holds true for the following relation.   **4**

A	B	C
a_1	b_1	c_1
a_1	b_1	c_2
a_2	b_1	c_1
a_2	b_1	c_3

(h) Discuss the two-phase locking protocol in concurrency control ?   **5**

2. (a) Construct on E-R diagram for the following problem definition: **8**

Each company operates four departments, and each department belongs to one company. Each department employs one or more employees, and each employee works for one department. Each of the employees may or may not have one or more dependents, and each dependent belongs to one employee.

(b) Explain Generalisation/Specialisation in an E-R diagram with the help of an example ?   **6**

(c) How would you map the following ER constructs into relations ? Give suitable example.   **6**

(i) Weak Entity

(ii) Generalization

(iii) Ternary Relationship.

3. (a) What is an outer join ? Discuss the different types of outer joins with the help of example.   5

   (b) Consider the following relations for a database that keeps track of business trips of salespersons in a sales office: 9

   SALES PERSON (SSN, Name, Start-Year, Dept-No)

   TRIP(SSN, From-City, To-City, Departure-Date, Return-Date, Trip-ID)

   EXPENSE(Trip-ID, Account #, Amount)
   Specify the following queries in SQL?

   (i) Find the details (all attributes of TRIP relation) for trips whose expenses exceeds $2000.

   (ii) Find the SSN of salesman who took trips to 'Honolulu'.

   (iii) Find the total trip expenses incurred by the salesman with

   $SSN = '234 - 56 - 7890'$.

   (iv) Write the DDL expressions for the above relations:

   (c) Define a view ? How is it different from a table ? Write the SQL Syntax for creating a view.   6

(b) What are the differences between BST-Tree 4
and B tree Indexes ?

(c) Compare sequential file organisation with 5
Heap files organisation. Discuss the
advantages and disadvantages of sequential
file organisation.

(d) Explain the following terms : 6

   (i)   Equi Join

   (ii) Data Replication

   (iii) Entity Integrity Constraints.

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4. (a) Consider the following relation for **10** published books :

Book (Book title, Author name, Book-type, list price, Author-affil, Publisher)

(Author-affil referes to the affiliation of the author.) Suppose the following dependencies exist :

Book-title → Publisher, Book-type

Book-type → list price

Author-name → Author-affil

(i) What normal form is the above relation in ? Justify.

(ii) Normalize the above relation to its highest Normal form.

(b) Discuss the different types of fragmentation **5** in distributed databases with the help of an example.

(c) Explain the ACID properties of transactions **5** in Database system.

5. (a) Consider the precedence graph of a **5** schedule given below. Is the schedule serializable ? Justify.