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MCS-023

MCA (Revised)

Term-End Examination

June, 2010

04332

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) Define 3 NF. Justify whether the following relation satisfies 3 NF or not ? In case it does not, decompose it into relations which do satisfy 3 NF. What advantages are gained by this decomposition ? **2+5+1=8**

Roll No.	Name	Department	Year	Hostel Name
R_1	N_1	D_1	1	H_1
R_2	N_2	D_2	1	H_1
R_3	N_3	D_1	2	H_2
R_4	N_4	D_2	2	H_2
R_5	N_5	D_1	3	H_3
R_6	N_6	D_3	4	H_4

(b) Consider the following tables : **15**

Working (P_name, C_name, Salary)

Living (P_name, Street, City)

Located (C_name, city)

When P_name = Professor name,

C-name = College name.

Write the SQL Queries for the following.

(i) List the names and cities they live in, of the professors who are working for the college C_1

(ii) Find the name, street and city of the professors who are working for the college C_2 and are having a salary more than 60000/-.

(iii) Find the names of professors who live and work in the same city.

(iv) Find the names of the professors who do not work for college C_3.

(v) Find the professors whose salaries are less than that of all of the college C_4 employees.

(vi) Display college wise total salary.

(c) Explain the concept of data independence. **3**

(d) List and explain all the types of constraints which can be violated while modifying database values. **6**

(e) What is a weak entity ? Explain with the help of an example. **1+2**

(f) Explain the hash file - organisation with the help of a suitable diagram. What are its shortcomings. **5**

2. (a) For the following statement, draw an E-R diagram. Make and state any reasonable assumptions. "A machine shop produces many parts which it takes on contract. It employs many operators who operate any of the machines. A part is produced using only one machine. A record is kept on the quantity of material needed for producing each part. The production of each part is tracked by giving a job number, start time and end time and operator's identification". **8**

(b) What is a transaction ? Describe the ACID properties of transaction. **1+4**

(c) What is a deadlock. Explain the schemes of deadlock prevention. **1+4**

(d) Define the term DML precompiler **2**

3. (a) Differentiate between the followings : **12**

(i) 2 Tier and 3 Tier architecture

(ii) Equi join and Natural join

(iii) Global and local transaction

(iv) Procedural and Non Procedural DMLs.

(b) What is Cartesian product. Explain using an example. How Cartesian product operation is related to the join operation. **4**

(c) Consider the relations **4**

student (id, name, address)

marks (id, course, marks)

Create an authorization matrix for two users Viz. Student and Administrator. Make and state suitable assumptions.

4. Explain the following with the help of an example / diagram wherever needed : 20

(a) Conditions of occurence of deadlocks

(b) Primary and Secondary indexes

(c) BCNF

(d) Two phase locking

(e) Conversion of relationships (in ER-Diagram) into relations.

5. (a) What is log based recovery ? Explain by taking an example of concurrent transactions. What are its drawbacks. 2+5+1

(b) Why do we need to fragment a relation ? What are the rules to be followed during fragmentation. 6

(c) Explain the following relational algebraic operations with the help of an example. 6

(i) Division operator

(ii) Set Difference operator