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CSE201

[ET]

Enrol. No. .....

END SEMESTER EXAMINATION : NOV. – DEC., 2017

DATABASE MANAGEMENT SYSTEMS

Time : 3 Hrs. *Maximum Marks : 70*

Note: ***Attempt questions from all sections as directed.***

SECTION – A (30 Marks)

Attempt any **five** *questions out of* **six.**
Each question carries **06** *marks.*

1. Explain the operation of two-tier client/server architecture for RDBMS. Give its various applications.

2. Given the following relational database schema of a personnel database :

   Employee (e#, name, salary, occupation, d#, mgr#, location)

   Department (d#, name, location)

   Specify the following queries in SQL and Relational Algebra :

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(a) Give a sorted list (salary) of employees living in Bad Homburg in descending order.

Indicate the name and salary of each employee, as well as the name and location of the department he/she is working for.

(b) Which employees of department K55 earn exactly the same amount of money as the average salary of all employees?

(c) Which departments in Frankfurt have more than 10 programmers?

3. Consider the universal relation R = {A,B,C,D,E,F,G,H,I,J} and the set of FDs F = {{AB->C} {A->DE} {B->F} {F->GH} {D->IJ}}. What is the key for R? Decompose R into 2NF and 3NF Relations.

4. Explain Multimedia Databases in detail.

5. Explain the sort-merge algorithm and illustrate its working with an example.

6. (a) Discuss the problems associated with NULLs when designing a relational database schema.

(b) What is the minimal Normal Form that a relation must satisfy? And Why?

SECTION – B (20 Marks)

Attempt any **two** *questions out of* **three.**
Each question carries **10** *marks.*

7. Consider the following Blood Bank System.

Blood bank is a critical entity in providing required type of blood to the patients at critical time. Their database keeps track of the inventory of the blood, together with relevant information like blood group, date received, location, date of expiry, donor, etc. The database keeps information such as name, address- and telephone' number of other blood banks in the area. The reason for doing so is to get blood of a particular from other bank in case of emergency. Information about donors is recorded as well. Donors are classified into occasional and regular donors. For the regular donors, the database keeps information such as identification number, blood type and a history of their donations. A list of health care providers in the area along with information such as address, telephone number, etc. is kept. The healthcare providers are the customers of the blood bank. They keep track of the blood transactions performed. These transactions are classified into: normal transactions and unexpected transactions (for example, the motor accidents during the holiday season). The reason for keeping track of the unexpected transactions is to

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use this information in estimating the extra amount of blood to keep in the inventory for each age group during the coming holiday season.

(a) Draw an extended E-R diagram for the system.

(b) Convert EER Diagram into Relations.

8. (a) What are the problems encountered in DDBMS while considering concurrency control and recovery?

(b) Give an example of a join that is not a simple equi-join for which partitioned parallelism can be used. What attributes should be used for partitioning?

9. What is normalization and why it is done? Explain 1NF, 2NF, 3NF, BCNF, and 4NF with example.

SECTION – C (20 Marks)

(Compulsory)

10. (a) Write short note on following : (5)

- 2PC & 3PC Protocols

(b) Write short note on DML, DDL and DCL with proper commands and examples. (10)

(c) Explain steps in detail to optimize a query. (5)