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T.E. (Computer) (Semester – I) Examination, 2010
DATABASE MANAGEMENT SYSTEMS (Common to I.T.)
(2003 Course)

Time : 3 Hours Max. Marks : 100

Instructions : *1) Answers to the **two** Sections should be written in **separate** books.*
*2) **Neat** diagrams must be drawn **wherever** necessary.*
*3) Black figures to the **right** indicate **full** marks.*
*4) Assume suitable data, **if necessary**.*

SECTION – I

1. a) What is difference between specialization and generalization ? Why do we not display this difference in schema diagrams ? **6**

   b) A Bank has many branches and a large number of customers. A customer can open different kinds of accounts with the bank. The bank keeps track of a customers by his SSN,name, address and ph_no.Age is used as a factor to check whether he is a major or minor. There are different types of loans, each identified by a loan number. A customer can take out more than one type of loan and all branches can give loans. Loans have a duration and interest rate. The account holder can enquire about the balance in his account. Draw an ER diagram and Schema definition for the bank. (Make suitable assumptions and use them in showing maximum and minimum cardinality ratio). **8**

   c) Explain four significant differences between file-processing system and DBMS ? **4**

OR

2. a) What are the enhancements that distinguish the EER model from the ER model ? Explain with example. **6**

   b) Explain the distinction between condition-defined and user-defined constraints. Which of these constraints can the system check automatically ? Explain your answer. **6**

   c) Specify the CODDs norms to be specified by RDBMS. **6**

3. a) Write short notes on : **8**

   i) Stored procedures and triggers.

   ii) Dynamic and embedded sql.

P.T.O.

b) Consider the relational database 8

Emp(e_name,street,city)

Works(e_name, company_name,salary)

Company(company_name,city)

Managers(e_name,mgr_name)

i) Give an SQL DDL definition of this database. Identify referential-integrity constraints that should hold, and include them in the DDL definition.

ii) Write SQL expression for the following queries :

i) Find the company with the most employees

ii) Find the company with the smallest payroll.

OR

4. a) Explain with example the concept of referential integrity. Also discuss the situations when referential integrity constraint is getting violated by insert,delete and update operations on the relation. 8

b) Use Armstrong's axioms to prove the soundness of the decomposition rule. 6

c) Comment on 'Safety of expressions'. 2

5. a) A set of FDs for the relation R{A, B, C, D, E, F} is AB–>C, C–>A, BC–>D,ACD–>B,BE–>C,EC–>FA,CF–>BD, D–>E. Find a minimum cover for this set of FDs. 6

b) Describe the concept of transitive dependency and explain how this concept is used to define 3NF. 6

c) What do you understand by physical database design ? What are the important factors that influence physical database design ? 4

OR

6. a) Define 1st, 2nd and 3rd normal forms when only primary keys are considered. How do the general definitions of 2NF and 3NF, which consider all keys of relation, differ from those that consider only primary keys ? 6

b) Which are different fact finding techniques ? State advantages and disadvantages of each. 6

c) What are the activities related to the database application system life cycle ? 4

SECTION – II

7. a) Write in detail various RAID levels and the factors to be taken into account when choosing a RAID level. **8**

   b) What are the steps involved in query processing ? Explain each in brief. **8**

OR

8. a) Explain the structure of a B^+-tree with a suitable example and a neat diagram. How does it implement dynamic multilevel index ? **8**

   b) What are the various techniques to handle variable length records ? Explain any one in detail. **8**

9. a) Compare the deferred and immediate modification versions of the log based recovery scheme in terms of ease of implementation and overhead cost. **8**

   b) Explain two-phase locking protocol. How does it ensure serializability ? **8**

OR

10. a) What is serializable schedule ? Describe with suitable example the type of serializable schedules. Also explain significance of precedence graph. **8**

    b) When do deadlocks happen ? How to prevent them, and how to recover if deadlock takes place. **8**

11. a) Explain in detail ODMG language constructs for object definition and object Manipulation. **8**

    b) Explain how a persistent pointer is implemented. Construct this implementation with that of pointers as they exist in general purpose languages such as 'C'. **8**

    c) Explain in brief what is object containment. **2**

OR

12. a) Explain advantages and disadvantages of distributed database systems. **6**

    b) Explain why ambiguity potentially exists with multiple inheritance, illustrate with suitable example. **8**

    c) Explain need for i) Backup ii) Replication. **4**
