[3863] – 441

T.E. (Computer Engg. Common to IT) (Semester – I) Examination, 2010
DATABASE MANAGEMENT SYSTEMS
(2008 Course) (New)

Time : 3 Hours Max. Marks : 100

*Instructions: 1) Answers to the **two** Section should be written in **separate** books.*
*2) **Neat** diagrams must be drawn **wherever** necessary.*
*3) Assume suitable data, if **necessary**.*
*4) Section **I** : Q. 1 or Q. 2, Q. 3 or Q. 4, Q. 5 or Q. 6*
*5) Section **II** : Q. 7 or Q. 8, Q. 9 or Q. 10, Q. 11 or Q. 12.*

SECTION – I

1. a) Explain data structures required in database system. 4
   b) Compare relational data model, Hierarchical Data Model and Network Data Model. 4
   c) Consider a university database that keeps track of students, their majors, their transcripts and their registrations, as well as of the university's course offerings. The database also keeps track of the sponsored research projects of faculty and graduate students. Draw an **Extended E-R diagram** which should be consist of aggregation, generalization and specialization and constrains on specialization. 9

OR

2. a) Explain Multi-user DBMS architectures in details. 4
   b) Explain the different constrains on specialization/generalization with suitable example. 4
   c) Draw ER diagram for banking enterprises which should be consist of entity sets, attributes, relationships, mapping cardinality and keys, aggregation, specialization, role and generalization. 9

3. a) Explain different types of joins in SQL with suitable example. 4
   b) Write a short note on Embedded SQL. 4

   Consider the relational schema given below 9

   Employee (person_name, street, city)

   Works (person_name, company_name, salary)

P.T.O.

Company (company_name, salary)

Manages (person_name, manger_name)

Write an efficient relational algebra expression for

1) Find the names of all the employees who live in the same city and same street as do their manager.
2) Find the name of all employees who do not work for the "ABC corporation".
3) Find the names of all the employees who earn more than every employee of "XYZ corporation".

OR

4. a) Explain Explicit Cursor and REF cursor in PL/SQL with suitable example. **4**

b) Explain Assertion and Triggers with suitable example. **4**

c) Consider the following relations. It defines the schema of the database application for a bank. It manages the branches and customers of the bank. Customers take loans (borrow money) or open accounts (deposit money) at one or more branches. **9**

Branch (B_No, B_name, B_city, asset), Customer (C_No, C_Name, C-city, street)

Loan (Loan_no, B_name, amount), Account (Acc_No, B_name, Balance)

Borrower (C_No, Loan_No), Depositor (C_No. Acc_No)

Write SQL queries for following questions :

1) Find the names and address of customers who have a loan.
2) Find loan data, ordered by decreasing amounts, then increasing loan numbers.
3) Find the pairs of names of different customers who live at the same address but have accounts at different branches.
4) Find the names and address of customers who have a loan for an amount exceeding 3 times their current balance.
5) Find the names of customers with both an account and a loan at Perryridge branch.

5. a) Consider following Relational Table. Find Nontrivial and Trivial Functional Dependency. 4

A	B	C
a1	b1	c1
a1	b1	c2
a2	b1	c1
a2	b1	c3

b) Explain desirable properties of Decomposition in Relational Database. 6

c) Write short note on Multivalued and Join Dependencies. 6

OR

6. a) Show that every 3NF schema is in 2NF. 4

b) Compute the closure of the following set F of functional dependencies for relational schema R = (A, B, C, D, E)

$A \rightarrow BC \quad CD \rightarrow E \quad B \rightarrow D \quad E \rightarrow A$

List the candidate keys for R. 6

c) Write proof for transitivity Rule, decomposition Rule, Pseudotransitivity Rule and Union Rule. 6

SECTION – II

7. a) Explain Heap file organization with Unclustered Tree Index and Unclustered Hash Index. 9

b) Why are joins expensive ? Describe the main approaches to evaluation joins. 8

OR

8. a) Describe the B+ tree insertion algorithm, and explain how it eliminates overflow pages. Under what conditions can an insert increase the height of the tree. 9

b) Discuss why the difference in cost between alternative plans for a query can be very large. Give specific examples to illustrate the impact of pushing selections and the availability of appropriate indexes. 8

9. a) Explain Log based recovery in DBMS. **6**

   b) Explain different anomalies due to interleaved execution of transactions. **6**

   c) Describe and compare deadlock detection and deadlock prevention schemes. Why detection schemes are more commonly used ? **5**

OR

10. a) Explain view serializability and conflict serializability with suitable example. **6**

    b) In optimistic concurrency control, no locks are set and transactions read and modify data objects in a private workspace. How are conflicts between transactions detected and resolved in this approach ? **6**

    c) Write a short note on Thomas Rule. **5**

11. a) Design Object Relational Database for composite attribute, Multi-valued attributes, and inheritance using SQL syntax with suitable example. **6**

    b) Write a short note on Data Warehouse Manager. **6**

    c) Explain advantages and disadvantages of hardware Pointer Swizzling Techniques. **4**

OR

12. a) Define Data Mining. Explain any Association Rule technique with suitable example. **6**

    b) Explain ETL process in Data Warehouse. **6**

    c) Compare 2 tier and n tier architectures. **4**
