Code No: RR420207 **Set No. 1**

IV B.Tech II Semester Supplimentary Examinations, Apr/May 2009
DATA BASE MANAGEMENT SYSTEMS
(Electrical & Electronic Engineering)

Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

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1. (a) What is DBMS? Explain the advantages of DBMS. [2+5=7]
   (b) What is a data model? Explain the relational data model. [3+6=9]
2. (a) Discuss the various DDL, DML commands with illustrations in SQL.
   (b) Why are null values not preferred in a relation? [12+4]
3. (a) What are the differences between static and dynamic files.
   (b) Discuss the techniques for allocating file blocks on disk. [8+8]
4. Let relations r1(A,B,C) and r2(C,D,E) have the following properties: r1 has 20000 tuples ,r2 has 45000 tuples , 25 tuples of r1 fit on one block, and 30 tuples of r2 fit on one block. Estimate the number of accesses required, using each of the following join strategies for r1$|X|$ r2:
   (a) nested-loop join
   (b) block nested-loop join
   (c) merge-join
   (d) hash-join. [4+4+4+4]
5. (a) Write short notes on
   - cost-based optimization
   - heuristic optimization
   (b) Detail on the structure of query optimization. [5+5+6]
6. (a) Explain the functional dependencies and multi valued dependencies with examples.
   (b) What is normalization? Discuss the 1NF,2NF, and 3NF Normal forms with examples. [8+8]
7. (a) What is meant by the concurrent execution of database transactions in a multiuser system?
   (b) Discuss why concurrency control is needed. Give informal example. [8+8]
8. (a) When a system recovers from a crash ? In what order must transaction be Undone and Redone? Why is this order important?
   (b) What is a log in the content of DBMS? How does check pointing eliminate some of the problems associated with log based recovery? [8+8]

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Code No: RR420207 **Set No. 2**

IV B.Tech II Semester Supplimentary Examinations, Apr/May 2009
DATA BASE MANAGEMENT SYSTEMS
(Electrical & Electronic Engineering)

Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

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1. (a) What is outer join ? What are its advantages over natural join? Give an example.
   (b) What is a domain constraint? Explain with an example. [10+6]

2. (a) Consider the following schema
   Employee (employee-name, street, city)
   Works (employee-name, company-name, salary)
   Company (Company-name, city)
   Managers (employee-name, manager-name)
   Write the following queries in SQL .
      i. Find the names and cities of residence of all employees who work for first bank corporation.
      ii. Find the names, Street address, and cities of residence of all employees who work for first Bank corporation and earn more than $\$10,000$.
      iii. Find all employees in the database who live in the same cities and on the same streets as do their managers.
      iv. Find all employees in the database who do not work for first Bank corporation. [2+2+3+3]
   (b) Describe about embedded SQL in examples. [6]

3. What are differences among primary, secondary and clustering indices? How do these differences affect the implementation of indices? Which of the indexes are dense and which are not. [16]

4. (a) Design a variant of the hybrid merge join algorithm for the case where both relations are not physically sorted, but both have a sorted secondary index on the join attributes.
   (b) Show that with n relations, there are (2(n-1)) ! / (n-1) ! different join orders. [8+8]

5. Write short notes on the following.
   (a) SQL query translation process.
   (b) Equivalences of relational algebra. [6+10]

6. (a) Design a generalization-specialization hierarchy for a motor-vehicle sales company. The company sells motor-cycles, passenger cars, vans and busses. Justify your placement of attributes at each level of hierarchy. Explain why they

(attributes) should not be placed at higher or lower level? Convert the E-R diagram so made to 3NF relational scheme.

(b) Normalize the relation R(A,B,C,D,E,F,G,H) into the third normal form using the following set of FDs:
AB− > C
BC− > D
CDE− > ABH
BH− > A
D− > EF
Is the decomposition dependency preserving? [8+8]

7. (a) Define the concept of a schedule for a set of concurrent transactions and describe an algorithm to test the serializability of a schedule. [8]

(b) Define each of the following in your own words

i. atomic transaction

ii. write-lock [4+4]

8. Explain in detail the ARIES recovery method. [16]

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Code No: RR420207 **Set No. 3**

IV B.Tech II Semester Supplimentary Examinations, Apr/May 2009
DATA BASE MANAGEMENT SYSTEMS
(Electrical & Electronic Engineering)

Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

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1. (a) Compare the two relational calculi.
   (b) Explain the relation schema and relational instance.
   (c) Discuss relationallly complete language. [6+6+4]

2. (a) Consider the following schema given. The primary keys are underlined.
   Sailors(sailor-id, sailor-name, sailor-rating, sailor-age)
   Boats(boat-id, boat-name, boat-color)
   Reserves(sailor-id, boat-id, day)

   Write the Nested queries in SQL.
   i. Find the names of sailors who have reserved boat number 120
   ii. Find the names of sailors who have reserved a green boat
   iii. Find the names of sailors who have not reserved a green boat
   iv. Find the names of sailors with the highest rating [2+2+3+3]
   (b) Explain the GROUP BY and HAVING clauses. [6]

3. (a) What are the differences between static and dynamic files.
   (b) Discuss the techniques for allocating file blocks on disk. [8+8]

4. What is
   (a) query − evaluation plan
   (b) query − execution engine
   (c) catalog information about relations and indices. [6+6+4]

5. Discuss various cost estimation methods of access based on indexing principle for relation operators. [16]

6. (a) Construct an E-R diagram for university registrar's office. The office maintains data about each class, including the instructor, the enrollment and the time and place of the class meetings. For each student class pair, a grade is recorded. Determine the entities and relationships that exist between the entities. Also construct the tabular representation of the entities and relationships.
   (b) What is an entity type? What is an entityset? Explain the difference between the entity, entity type and entityset? [10+6]

7. (a) Discuss the different types of transaction failures.

(b) Which component of DBMS is responsible for concurrency control? How is this feature used to resolve conflicts? [6+10]

8. (a) When a system recovers from a crash ? In what order must transaction be Undone and Redone? Why is this order important?

(b) What is a log in the content of DBMS? How does check pointing eliminate some of the problems associated with log based recovery? [8+8]

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Code No: RR420207 **Set No. 4**

IV B.Tech II Semester Supplimentary Examinations, Apr/May 2009
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(Electrical & Electronic Engineering)

Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
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1. (a) Explain
   i. The data definition language
   ii. The data manipulation language
   iii. The buffer manager
   iv. The data model.
   Which of the above plays an important role in representing information about the real world in a database? [2+2+3+2+1]
   (b) Explain the responsibilities of a database manager. [6]
2. (a) what are the various salient features of the QBE ? [7]
   (b) Explain the following :
   i. Relational database query.
   ii. Query language
   iii. SQL
   iv. Embedded SQL. [2+2+2+3]
3. Give algorithms for inserting a new key into a B-tree [16]
4. (a) Explain about projection based on sorting.
   (b) Explain about projection based on hashing. [8+8]
5. (a) At what point during query processing does optimization occur.
   (b) Consider the following SQL queries for a bank DB
   select T.branch_name
   from branch T,branch S
   where T.assets> S.assets
   and S.branch_city = "Chennai"
   Write an efficient relational-algebra expression that is equivalent to this query. Justify
   (c) What is multiple equivalence. How is multiple transformation done by the following query?
   $\Pi_{customer\_name}$ (σ_{branch_city} = "Chennai"(branch X (account X depositor))) [4+6+6]

6. (a) Construct an E-R diagram for university registrar's office. The office maintains data about each class, including the instructor, the enrollment and the time and place of the class meetings. For each student class pair, a grade is recorded. Determine the entities and relationships that exist between the entities. Also construct the tabular representation of the entities and relationships.
   (b) What is an entity type? What is an entityset? Explain the difference between the entity, entity type and entityset? [10+6]
7. (a) Explain cascading rollback and recoverable schedule.
   (b) Describe each of the following locking protocols.
      i. Two Phase Lock
      ii. Conservative Two Phase Lock [5+5+6]
8. (a) When a system recovers from a crash ? In what order must transaction be Undone and Redone? Why is this order important?
   (b) What is a log in the content of DBMS? How does check pointing eliminate some of the problems associated with log based recovery? [8+8]

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