Code No: RR321903 **Set No. 1**

III B.Tech II Semester Supplementary Examinations,
November/December 2005
DATA BASE MANAGEMENT SYSTEMS
(Electronics & Computer Engineering)

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

Answer any FIVE Questions
All Questions carry equal marks

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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) Explain with an example in SQL
   i. Unspecified where-clause and use of Asterisk
   ii. Exist and not exists
   iii. Explicit sets and NULLS
   iv. Renaming attributes and joined tables. [2+2+2+2]
   (b) Consider the following scheme for the COMPANY database. The primary keys are underlined.
   Employee (SSN, Fname, Lname, Birthdate, Address, Salary, Dnumber)
   Department (Dnumber, Dname, Dlocation)
   Perform the following operations using SQL. Assume the data:
   i. Insert a record into employee table
   ii. Delete an employee with SSN equal to 10.
   iii. Update the Dnumber of the employee tuple having salary greater than Rs 10,000.
   iv. Retrieve the name and address of all employees who work for the "XYZ" department. [2+2+2+2]

3. (a) Which of the three basic file organizations would you choose for a file where the most frequent operations are as follows,
   i. Search for records based on a range of field values.
   ii. Perform insert and scans where the order of records does not matter.
   iii. Search for a record based on a particular field value.
   (b) Define dense index.

(c) How does multi level indexing improve the performance of searching an index file. [6+4+6]

4. (a) How does hybrid hash join improve upon the basic hash join algorithm.
   (b) Give an example of how buffer replacement policies can affect the performance of a join algorithm. [8+8]

5. (a) What is indexing ? Explain with an example.
   (b) Explain about query processing. [8+8]

6. (a) What is multivalued dependencies? What type of constraint does it specify ? When does it arise?
   (b) Explain the join dependencies and 5NF [8+8]

7. (a) Develop an example showing how a single locking protocol could lead to a dead lock .
   (b) Explain about commit and roll back operations . [10+6]

8. Write short notes on
   (a) Check-pointing
   (b) Media recovery [8+8]

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Code No: RR321903 **Set No. 2**

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

Answer any FIVE Questions
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1. (a) What is DDL? Explain the commands used for creating, deleting and modifying the tables.
   (b) What is the difference between a candidate key and a primary key for a given relation? What is a super key ? [8+8]

2. (a) Explain with an example about Aggregate functions and grouping in SQL. [5+3=8]
   (b) Assume the following relations:
   STUDENT (Stname, Stnum, Totalmarks, Semester)
   HOSTEL (Stnum, Roomnum)
   Represent the following queries in SQL.
      i. Get the details of 6th semester students
      ii. Obtain the room number allotted to Girish
      iii. Obtain the names of students staying in room number 24.
      iv. Get the name and marks of student whose number is 24046 [2+2+2+2]

3. (a) Which of the three basic file organizations would you choose for a file where the most frequent operations are as follows,
      i. Search for records based on a range of field values.
      ii. Perform insert and scans where the order of records does not matter.
      iii. Search for a record based on a particular field value.
   (b) Define dense index.
   (c) How does multi level indexing improve the performance of searching an index file. [6+4+6]

4. (a) Describe how to extend the hash-join algorithm to compute the natural left outer join, the natural right outer join and the natural full outer join.
   (b) Explain the structure of optimisation
   (c) What are the usage of query processing techniques?
   (d) Discuss the various steps involved in processing a query with examples?[6+3+3+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) When are two sets of functional dependencies are equivalent? How can we determine their equivalence?

   (b) Define BCNF ? How does BCNF differ from 3NF. Explain with an example. [6+10]

7. (a) Explain the concept of log based recovery.

   (b) Briefly explain why recovery is needed. [10+6]

8. (a) How is the Recovery Manager is responsible for transaction atomicity and durability? Explain.

   (b) Explain Stealing Frames and Forcing pages?

   (c) What are difference between update log record and CLRS? [7+5+4]

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Code No: RR321903 **Set No. 3**

III B.Tech II Semester Supplementary Examinations,
November/December 2005
DATA BASE MANAGEMENT SYSTEMS
(Electronics & Computer Engineering)

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

Answer any FIVE Questions
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1. Write short notes on:
   (a) Key constraints
   (b) General constraints
   (c) Relational calculus. [6+5+5]
2. (a) Give the various methods of managing data security
   (b) Describe the dynamic SQL [8+8]
3. (a) What happens if there is a page request when all pages in the buffer pool are dirty. Explain. [7]
   (b) Define the terms,
      i. Indexing field
      ii. Clustering field
      iii. Secondary key field
      iv. Block address [2+2+2+3]
4. Discuss about the following:
   (a) The system R optimizer.
   (b) The iterator interface for operators and access methods. [10+6]
5. Discuss different types of parameters that are used in cost functions. Where is this information kept? [16]
6. (a) Compute the canonical cover (F_c) of the following set F of functional dependencies for relation scheme R =(A,B,C,D,E)
   A− > BC
   CD− > E
   B− > D
   E− > A
   (b) Discuss the BCNF and III Normal Form with examples [8+8]
7. (a) Explain Two phase locking with algorithms.
   (b) What is Transaction? In what ways is it different from an ordinary program (Like 'C'). [10+6]

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

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Code No: RR321903 **Set No. 4**

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(Electronics & Computer Engineering)

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

Answer any FIVE Questions
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1. (a) Consider the following schema for a COMPANY database
Employee (Name, SSN, Address, Sex, Salary, Dnumber)
Employee (Name, SSN, Address, Sex, Salary, Dnumber)
Department (Dname, Dnumber, MGRSSN, MGRSTART_date)
Dept-locations (Dnumber, Dlocations)
Project (Pname, Pnumber, Plocation, Dnumber)
Works-on (ESSN, Pnumber, Hours)
Dependent (ESSN, Dependent-name, Sex, Bdate, Relationship)

Write the queries in Relational Algebra to

i. Retrieve all employees who either work in department 4 and make over 25,000 per year or work in department 5 and make over 30,000
ii. Retrieve the Social Security numbers of all employees who either work in department 5 or directly supervise a employee who works in department 5.
iii. Retrieve the name and address of all employees who work for the "Research" department
iv. List all the projects on which employee "Smith" is working. [3+3+3+3]

(b) What is relational completeness? If a query language is relationally complete, can you write any desired query in that language [4]

2. (a) Give the various methods of managing data security
(b) Describe the dynamic SQL [8+8]

3. (a) Discuss the mechanism used to read data from or write data into the disk.
(b) Explain how the double buffering improves the block access time [8+8]

4. (a) Discuss in detail the steps involved in processing a query.
(b) Explain any one of the algorithms for computing the join of relations. [8+8]

5. (a) Discuss the role of relational algebra equivalences in query optimization.
(b) Explain various steps involved in the query processing. [8+8]

6. (a) What is Normalization? Discuss the first, second and third normal forms with examples.

(b) Explain with an example why 4NF is more desirable normal form than BCNF. [8+8]

7. (a) Explain Two phase locking with algorithms.

   (b) What is Transaction? In what ways is it different from an ordinary program (Like 'C'). [10+6]

8. (a) Discuss the un-do and re-do operations and the recovery techniques that use each.

   (b) Compare the shadow(D)paging recovery scheme with the log-based recovery schemes in terms of case of implementation and overhead cost. [8+8]

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