Code No: R22053   **R10**   SET - 1

II B. Tech II Semester, Supplementary Examinations, Dec – 2012
DATA BASE MANAGEMENT SYSTEMS
(Com. to CSE, IT)

Time: 3 hours   Max. Marks: 75

Answer any **FIVE** Questions
All Questions carry **Equal** Marks
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1. a) What are the different types of database end users? Discuss the main activities of each.
   b) State the difference between a file management system and a database management system.

2. Give an E-R diagram for a data base showing fatherhood, motherhood and spouse relationships among men and women.

3. a) What is a view? How can it be created? Explain with an example.
   b) Explain about Set operators in Relational algebra

4. a) How do triggers offer a powerful mechanism for dealing with the changes to database with Suitable example.
   b) Explain how the "GROUP By" clause works. What is the difference between the WHERE and HAVING clauses? Explain them with the help of an example for each.

5. a) Define a functional dependency. Briefly describe reasoning about FDs.
   b) What are join dependencies? Why they are important in database design?

6. a) How can you implement atomicity in transactions? Explain
   b) With a neat sketch discuss the states a transaction can be in.

7. a) List the differences between cluster, primary and secondary indexes.
   b) What is index data structure? Briefly describe Hash-Based Indexing.

8. a) Construct a B+ tree to insert the following key elements (order of the tree is 3) 5, 3, 4, 9, 7, 15, 14, 21, 22, 23.
   b) Mention the purpose of indexing. How this can be done by B+ tree? Explain.

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Code No: R22053 **R10** SET - 2

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1. a) With a neat sketch discuss the three-schema architecture of a DBMS.
   b) What is data independence? List the differences between logical data independence and physical data independence.

2. Draw an E-R diagram for the data base of hospital with a set of patients and a set of medical doctors. With each patient, a log of the various tests conducted is also associated.

3. a) How will you enforce integrity constraints in a relation? Explain with an example.
   b) Discuss in detail the operators SELECT, PROJECT, UNION with suitable examples.

4. a) Consider the following relations :Employee (emplD, Name, SurName, address, DOB, sex, position,deptNo) Department (dtptNo, deptName, mgr, empID) Project (projNo, projName, deptNo) Work on (empID, projNo, hours worked)
   Write the SQL statements for the following:
   i) List the name and addresses of all employees who work for the IT department.
   ii) List the total hours worked by each employee, arranged in order of department number and within department, alphabetically by employee surname.
   iii) List the total number of employees in each department for those departments with more than 10 employees.
   iv) List the project number, project name and the number of employees who work on that project.
   b) Briefly describe join operations.

5. a) What is normalization? Explain 1NF, 2NF, 3NF and BCNF with suitable example.
   b) What is MVD? What are MVD complementation and MVD argumentation?

6. a) Explain the distinction between the terms serial schedule and serializable schedule. Give relevant example.
   b) Explain various recovery Schedules during transaction in detail

7. a) Give the comparison of various file organizations.
   b) Briefly describe heap files and sorted files.

8. a) Mention the purpose of indexing. How this can be done by B+ tree? Explain.
   b) Why is a B+ tree a better structure than a B-tree for implementation of an indexed sequential file? Explain this with an example.

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Code No: R22053   **R10**   **SET - 3**

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1. a) Explain the role and functions of the database administrator.
   b) State the advantages and disadvantages of the three record based data models: network, hierarchical and relational.

2. a) With suitable ER diagrams, briefly describe Relationships and Relationship sets.
   b) What is a key constraint? Briefly describe key constraints for ternary relationships.

3. Given the relational schemes :
          ENROL (S#, C#, Section) - S# represents student number
          TEACH (Prof, C#, Section) - C# represents course number
          ADVISE (Prof, S#) - Prof is thesis advisor of S#
          PRE_REQ (C#, Pre_C#) - Pre_C# is prerequisite course
          GRADES (S#, C#, Grade, Year)
          STUDENT (S#, Sname) - Sname is student name
   Give queries expressed in relational algebra, and tuple relational calculus for the following:
   i) List all students taking courses with Zeba.
   ii) List all students taking at least one course that their advisor teaches.
   iii) List those professors who teach more than one section of the same course

4. a) Briefly describe the DDL and DML command in SQL with syntaxes and examples each.
   b) Write short notes on types of joins.

5. a) Define a primary key and a secondary key. In a record, " non key fields are functionally dependent on the key" . Explain with an example.
   b) What is FD? Explain the role of FD in the process of normalization.

6. a) Discuss the ACID properties of a transaction. Give relevant example.
   b) Describe the concept of serilalizability with suitable example.

7. a) Give the comparison of various file organizations.
   b) What is a concatenated key? Briefly describe composite search keys.

8. a) Describe the structure of B+ tree and list the characteristics of a B+ tree
   b) What does ISAM stand for? Briefly describe the advantages of ISAM indexes.

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1. a) Explain the system structure of a database system with neat block diagram.
   b) State the differences between generalization and aggregation.

2. Construct an E-R diagram for a car insurance company with a set of customers, each of which owns a number of cars. Each car has a number of recorded accidents associated with it.

3. a) How will you enforce integrity constraints and how will you handle NULL values in relations?
   b) Give the syntaxes and semantics of tuple relational calculus.

4. a) Consider the employee database, where the primary keys are underlined.
        Employee (<u>empname</u>, street, city)
        Works (<u>empname, companyname</u>, salary)
        Company (<u>companyname</u>, city)
        Manages (<u>empname, managername</u>)
   And given an expression in SQL for the following queries:
   i) Find the names of all employees who work for First Bank Corporation.
   ii) Find the names, street addresses, and cities of residence of all employees who work for
       First Bank Corporation and earn more than 200000 per annum.
   iii) Find the names of all employees in this database who live in the same city as the
   companies for which they work.
   b) What are nested queries? Explain with example

5. a) Describe about the Multi-Valued Dependencies and Fourth normal form with suitable example.
   b) How can you identify join dependencies that must hold in a data base?

6. a) Explain the four important properties of transaction that a DBMS must ensure to maintain database.
   b) Describe the concept of serilalizability with suitable example.

7. a) What are the advantages and disadvantages of hash indices relative to B+- tree indices?
   b) What is an equality query? Briefly describe clustered index organization.

8. Describe the structure of B+ tree and give the algorithm for search in the B+ tree with example.

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