Code No: K0227 **R07** **Set No. 1**

IV B.Tech. II Semester Regular/Supplementary Examinations, April, 2012

DATABASE MANAGEMENT SYSTEMS

(Electrical and Electronics Engineering)

Time: 3 Hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks
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1. a) List and briefly explain the components of DBMS.
   b) Briefly describe aggregations.

2. a) With an example, describe the difference between tuple relational calculus and domain relational calculus.
   b) Does the relational model, as seen by an SQL query writer, provide physical and logical data independence? Explain.

3. a) What are null values? What is the use in relational model? How do they affect the meaning of queries?
   b) What is a trigger and what are the parts of trigger? With an example, describe the differences between row-level and statement-level trigger.

4. a) What is functional dependency? With an example, briefly describe functional dependencies.
   b) What is decomposition? What is redundancy? What problems may be caused by the use of decomposition?

5. a) What is a lock? What is locking protocol? Briefly describe strict two-phase locking protocol.
   b) Briefly describe performance locking.

6. a) What is Log? What is LSN? Briefly describe the contents of the update log record.
   b) Briefly describe optimistic concurrency control.

7. a) What is a file? Briefly describe the operations that are considered for comparing the performance of file organizations.
   b) What is clustered index? How many clustered indexes can you build on a file?

8. a) What is Buffer pool and what is Buffer Manager? Why does every page request in a DBMS go through the buffer manager?
   b) Compare and contrast linear vs extendible hashing.

Code No: K0227 **R07** **Set No. 2**

IV B.Tech. II Semester Regular/Supplementary Examinations, April, 2012

DATABASE MANAGEMENT SYSTEMS

(Electrical and Electronics Engineering)

Time: 3 Hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

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1. a) What is WAL Property, and with an example, briefly describe its importance.
   b) What is a view? What is data independence? In what way view is related to data independence?

2. a) Briefly describe the importance of unsafe calculus query.
   b) What are set operations? With an example, briefly describe selection and projection operations.

3. a) What is pattern matching? What support does SQL offer for string pattern matching?
   b) What is grouping? Is there a counterpart in relational algebra? Explain this feature, and discuss the interaction of the HAVING and WHERE clauses.

4. a) What is dependency? Briefly describe about multivalued dependencies and Fourth Normal Form.
   b) When the decomposition is said to be dependency preserving? Describe the importance of this property.

5. a) What is interleaved execution? Briefly describe reading and overwriting uncommitted data.
   b) What is schedule and what is serial schedule? With an example describe serializable schedule?

6. a) What is concurrency control? How strict 2PL does ensure serializability and recoverability?
   b) What is recovery manager? Briefly describe main principles behind ARIES recovery algorithm.

7. a) What issues are considered in using clustered indexes? What is an index only evaluation method? What is its primary advantage?
   b) What is a composite search key? What are the pros and cons of composite search keys? What SQL commands support index creation?

8. a) What is page format and what is record format? Briefly describe Disk management.
   b) What is tree-based indexing technique? Describe the relation between files and indexes?

Code No: K0227 **R07** **Set No. 3**

IV B.Tech. II Semester Regular/Supplementary Examinations, April, 2012

DATABASE MANAGEMENT SYSTEMS

(Electrical and Electronics Engineering)

Time: 3 Hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

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1. a) What is weak entity? With an example briefly describe Binary Vs Ternary relation ships.
   b) What is DBA? Briefly describe the responsibilities of a DBA.

2. a) What is the difference between a candidate key and the primary key for a given relation? What is a super key? Give examples for each.
   b) For the relational schema: *Emp(eid: integer, ename: string, age: integer, salary: real) Works(eid: integer, did: integer, pcttime: integer) Dept(did: integer, dname: string, budget: real, managerid: integer)* Answer the following:
      i). Give an example of a foreign key constraint that involves the Dept relation. What are the options for enforcing this constraint when a user attempts to delete a Dept tuple?
      ii). Write the SQL statements required to create the preceding relations, including appropriate versions of all primary and foreign key integrity constraints.
      iii). Define the Dept relation in SQL so that every department is guaranteed to have a manager.
      iv). Write an SQL statement to add John Doe as an employee with eid = 101, age = 32 and salary = 15, 000.

3. a) What are range variables in SQL? How can you give names to output columns in a Query that are defined by arithmetic or string expressions?
   b) Briefly describe the operators IN, EXISTS, UNIQUE, ANY, and ALL in writing nested queries?

4. a) What is BCNF? What is the motivation for putting a relation in BCNF? What is the motivation for 3NF? In what way 3NF is different from BCNF.
   b) What is lossless join? What is dependency preservation? Briefly describe problems caused by redundancy.

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5. a) What are ACID properties? With examples, briefly describe AICD properties.
   b) What is a Lock? With an example, briefly describe lock based concurrency control protocol.

6. a) What is transaction? Briefly describe the phases of transaction.
   b) What is transaction table and what is dirty page table? Briefly describe WAL protocol.

7. a) What is tree-based indexing technique? Briefly describe the usage of a tree-based index.
   b) When would you use a hash-based index? Briefly describe the usage hash-based index.

8. a) What is RAID? Briefly describe its impact on performance, redundancy and reliability.
   b) What is the drawback of ISAM index structure and How B+ tree index structures provide solution? Briefly describe the characteristics of B+ tree index structure.

Code No: K0227 **R07** **Set No. 4**

IV B.Tech. II Semester Regular/Supplementary Examinations, April, 2012

DATABASE MANAGEMENT SYSTEMS

(Electrical and Electronics Engineering)

Time: 3 Hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks
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1. a) With an example, describe *Entity vs Relationship* and *Entity vs Attribute*.
   b) What is relationship? Briefly describe the additional features of ER model.

2. a) What are integrity constraints? Define primary key constraint and foreign key constraint. How these constraints are expressed in SQL?
   b) What is join operation and why it is required? With an example, briefly describe condition join, natural join and equijoin.

3. a) What are nested queries? What is correlation in nested queries? With examples, briefly describe the usage of nested queries.
   b) What are triggers? What are the uses of triggers? Explain the difference between triggers and integrity constraints.

4. a) What is attribute closure? Briefly describe about Armstrong's axioms.
   b) What is functional dependency? Why some functional dependencies are called trivial? Give a set of FDs for the relation schema R (A, B, C, D) with primary key AB under which R is in 1NF but not in 2NF.

5. a) What is a transaction? Briefly describe transaction characteristics in SQL.
   b) What is recovery manager? Briefly describe stealing frames and forcing pages.

6. a) What is system crash? With examples, describe phases of recovering from a system crash.
   b) What are latches and convoys? Briefly describe about lock management.

7. a) What is a heap file? Briefly describe clustered files.
   b) What is indexing? What is a primary index? Why indexing is a central aspect of physical database design?

8. a) What is static hashing? Briefly describe extendible hashing.
   b) What is overflow page? With a neat diagram, briefly describe ISAM index structure.