

**IV B.Tech I Semester Regular Examinations, November 2008**  
**DATA BASE MANAGEMENT SYSTEMS**  
( Common to Electronics & Communication Engineering, Electronics &  
Instrumentation Engineering, Electronics & Control Engineering,  
Electronics & Telematics and 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 the Transaction management in a database.  
(b) Discuss the Query Processor of Database system structure. [8+8]
2. (a) What is a relation? Differentiate between relation schema and relation instance. Define the terms unity and degree of relation. What are domain constraints?  
(b) Explain new insertion, deletion and updating of database is performed in the relational algebra. [8+8]
3. For the following relational database, give the expressions in SQL. [16]  
branch\_schema (branch\_name, branch city, assets) customer\_schema (customer name, customer street, customer city) Loan\_schema (branch name, loan\_number, amount) Borrower\_schema (customer name, Loan number) Account\_schema (branch name, account\_number, balance) Depositer\_schema (Customer name, account\_number)  
(a) Find the names of all customers whose street address include substring 'Main'  
(b) Find average balance for each customer who lives in Harrison and at least three accounts?  
(c) Find all customer who have a loan at bank whose names are neither 'smith' nor 'jones'?  
(d) Display customer names in alphabetical order who have a loan at the perryridge branch?  
(e) Find all customers having loan, account or both at bank?  
(f) Find all customers who have account but not loan at bank?  
(g) Find all customers who have an account at all branches?  
(h) Pay 5% interest on accounts whose balance > average?
4. (a) Explain about 4NF? Give one example?  
(b) Explain about 5NF? Give one example? [8+8]
5. (a) Differentiate between conflict Serializability & view serializability with example. [12]  
(b) What are the 4 properties of database. [4]

6. (a) What are the recovery-related steps involved during normal execution. [6]  
(b) How does the two phase locking protocol ensures Serialazability. [10]
7. (a) Explain about Clustering File Organistaion.  
(b) Explain about Heap File Organization. [8+8]
8. (a) When is it preferable to use a dense index rather than a sparse index? Explain your answer.  
(b) Since indices speed query processing, why might they not be kept on several search keys? List as many reasons as possible. [8+8]

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1. (a) What are the types of languages a database system provides? Explain.  
(b) What are the five main functions of a Database Administrator? [8+8]
2. Consider the following database.  
Employee (employee-name, street, city)  
Works (employee-name, company-name, salary)  
Company (company-name, city)  
Manager (employee-name, manager-name)  
Give an expression in the relational algebra, the tuple relational calculus, and the domain relational calculus, for the following query.  
Find the names of all employees who work for estate bank. [16]
3. Write the Equivalence Rules for the transportation of Real Expressions. [16]
4. (a) Explain about 4 Nf? Give one example?  
(b) Explain about 5 Nf? Give one example? [8+8]
5. (a) Differentiate between conflict Serializability & view serializability with example. [12]  
(b) What are the 4 properties of database. [4]
6. (a) What are the merits & demerits of using fuzzy dumps for media recovery. [6]  
(b) Explain the phases of ARIES Algorithm. [4]  
(c) Explain 3 main properties of ARIES Algorithm [6]
7. Explain why the allocation of records to blocks affects database-system performance significantly. [16]
8. Explain all the operations on  $B^+$ tree by taking a sample example. [16]

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1. What are the major disadvantages of file processing system? [16]
2. (a) What is a foreign key constraint? Why are such constraints important? What is referential integrity?  
(b) How many distinct tuples are in a relation instance with cardinality 22? [8+8]
3. Explain in detail the following [16]
  - (a) Nested - loop join
  - (b) Block Nested Loop join.
4. Explain the 4NF. Why is it useful? Explain with example [16]
5. (a) Differentiate between conflict Serializability & view serializability with example. [12]  
(b) What are the 4 properties of database. [4]
6. (a) What are the merits & demerits of using fuzzy dumps for media recovery. [6]  
(b) Explain the phases of ARIES Algorithm. [4]  
(c) Explain 3 main properties of ARIES Algorithm [6]
7. Give an example of a database application in which the pointer method of representing variable-length records is preferable to the reserved-space method. Explain your answer. [16]
8. (a) When is it preferable to use a dense index rather than a sparse index? Explain your answer.  
(b) Since indices speed query processing, why might they not be kept on several search keys? List as many reasons as possible. [8+8]

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1. (a) What are the types of languages a database system provides? Explain.  
(b) What are the five main functions of a Database Administrator? [8+8]
2. (a) Distinguish between procedural and non-procedural DML's.  
(b) Define relational algebra, Tuple & Domain relational calculus.  
(c) What are the differences between the two types of relational calculus? [6+6+4]
3. (a) What is functional dependency ? how it is useful in dbms?  
(b) Normalize the relation R (A, B, C, D, E, F, G, H) into the 3NF using the following set of FDs ABC, BCD, CDEABH, BHA, DEF is the decomposition dependency preserving? [8+8]
4. (a) Explain about 4 Nf? Give one example?  
(b) Explain about 5 Nf? Give one example? [8+8]
5. (a) Define the concept of a transaction. [6]  
(b) Write a short notes on
  - i. Serializability
  - ii. Recoverability [10]
6. (a) Explain optimistic concurrency control under timestamp [8]  
(b) Discuss about deadlock detection & starvation. [8]
7. Explain about Variable-Length file organization with an example. [16]
8. Explain about the  $B^+_tree$  and the structure of  $B^+_tree$  in detail with an example. [16]

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