

Total number of printed pages – 4

B. Tech
BCSE 3202

Fourth Semester Examination – 2007

RELATIONAL DATABASE MANAGEMENT SYSTEMS

Full Marks – 70

Time – 3 Hours

*Answer Question No. 1 which is compulsory
and any five from the rest.*

*The figures in the right-hand margin
indicate marks.*

1. Answer the following questions : 2×10
- (a) What is the difference between a primary key and a candidate key ?
 - (b) Let $R = (A, B, C, D)$ and functional dependencies (1) $A \rightarrow C$, (2) $AB \rightarrow D$. What is the closure of $\{A, B\}$?
 - (c) What do you mean by semi less join ?
 - (d) What is a super key ?

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- (e) What are the two techniques to prevent deadlock?
- (f) What do you mean by multi-valued dependency?
- (g) Define and differentiate between Natural Join and Inner Join.
- (h) What is meant by Concurrency?
- (i) Mention the various categories of Data Model.
- (j) Define Entity Type, Entity Set and Value Set.
2. (a) What is an internal model of a DBMS? Explain the difference between logical and physical data independence. 5
- (b) Define entity, attribute and relationships as used in relational databases. Describe purpose of E-R Model. Illustrate your answer with an example. 5
3. (a) What is normalization of relation? What is a key attribute in a relation? What is the difference between 1st Normal Form and 2nd normal form? 5

- (b) What are the major components of the relational model? What is simple relational database? What are two models in which you can use SQL? 5
4. (a) Explain difference between Implicit and Explicit locks. Give examples to support your answer. 5
- (b) What is an object-oriented database? What are its advantages compared to relational database? Explain some applications where an object-oriented database may be useful. 5
5. (a) State Armstrong's axioms. Show that Armstrong's axioms are complete. 5
- (b) Explain the difference between inner join and outer join. What are the restrictions on using outer join? Give examples to support your answer. 5
6. (a) What does the term *redundancy* mean? Discuss the implications of redundancy in a relational database. 5
- (b) Define (i) Primary key, and (ii) Foreign key, suppose relation R (A, B, C, D, E) has functional dependencies:

$AB \rightarrow C$

$D \rightarrow A$

$AE \rightarrow B$

$CD \rightarrow E$

$BE \rightarrow D$

Find all the candidate keys of R. 5

7. (a) Consider the following tables : 5

S			R		
A	B	C	A	F	G
3	7	9	5	8	1
8	6	5	8	2	6

(b) Show the semantics and the output of the following query : 5

SELECT *
FROM S, R
WHERE S.A = R.A AND S.B = R.G.

8. Write notes on following : 2.5x4

- (a) Data Fragmentation
- (b) B-tree
- (c) Fourth Normal Form
- (d) Query Optimization.