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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 → C, (2) AB → D. What is the closure of {A, B} ?

   (c) What do you mean by semi less join ?

   (d) What is a super key ?

P.T.O.

(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 is 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

A	B	C
3	7	9
8	6	5

R

A	F	G
5	8	1
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 : 2.5×4

(a) Data Fragmentation

(b) B-tree

(c) Fourth Normal Form

(d) Query Optimization.