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B.E./B.Tech. DEGREE EXAMINATION, MAY/JUNE 2007.

Third Semester

Computer Science and Engineering

CS 234 — DATABASE MANAGEMENT SYSTEMS

Time : Three hours   Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Explain the different views of data.

2. Define Data Dictionary.

3. Differentiate a weak entity set from a strong entity set.

4. What is meant by Embedded SQL?

5. State the various pitfalls in relational database.

6. Write about Assertions.

7. Explain the phases of the protocol which ensures serializability.

8. Classify the various types of system failure.

9. State the advantages and disadvantages of Data Replication.

10. Describe the importance of Data Mining.

PART B — (5 × 16 = 80 marks)

11. (a) (i) Explain about DBMS architecture.   (8)

        (ii) How data models are categorized.   (8)

                        Or

    (b) (i) Write about data independence.   (4)

        (ii) Explain the various keys involved in relational database with a
             suitable example.   (12)

12. (a) (i) Let R = (A, B, C), and let r1 and r2 both be relations on schema R. Give an expression in the domain relational calculus that is equivalent to each of the following:

(1) $\prod_A(r)$

(2) $\sigma_{B=17}(r)$

(3) $r1 \cup r2$

(4) $r1 \cap r2$

(5) $r1 - r2$

(6) $\prod_{A,B}(r1) \infty \prod_{B,C}(r2)$. (12)

(ii) Write about Query Languages. (4)

Or

(b) Consider the following employee database. Give an expression in SQL for each of the following queries.

(i) Find the names of all employees who work for First Bank Corporation.

(ii) Find the names and cities of residence of all employees who work for First Bank Corporation.

(iii) Find the names, street address and cities of residence of all employees who work for First Bank Corporation and earn more than $10,000.

(iv) Find all the employees in the database who do not work for First Bank Corporation.

(v) Find all employees in the database who earn more than every employee of Small Bank Corporation.

(vi) Assume that the companies may be located in several cities. Find all companies located in every city in which Small Bank Corporation is located.

13. (a)

(b)

14. (a)

(b)

15. (a)

(b)

(vii) Find the company that has the most employees.

(viii) Find those companies whose employees earn a higher salary, on average, than the average salary at First Bank Corporation.

Employee (employee-name, street, city)

Works (employee-name, company-name, salary)

Company (company-name, city)

Manages (employee-name, manager-name).   (8 × 2 = 16)

13. (a) Explain the different levels of normalization with a suitable example. (16)

Or

(b) (i) Differentiate between primary index and secondary index.   (6)

(ii) Write about Hash functions.   (6)

(iii) Write an assertion for the bank database to ensure that the assets value for the Perryridge branch is equal to the sum of all the amounts lent by the Perryridge branch.   (4)

14. (a) (i) List the ACID properties. Explain each property in detail.   (8)

(ii) Write notes on Conflict and View Serializability.   (8)

Or

(b) (i) How deadlocks can be detected and recovered?   (8)

(ii) Compare the deferred and immediate-modification versions of the log based recovery schemes.   (8)

15. (a) (i) Describe Object Oriented Data model.   (8)

(ii) Discuss the various approaches in which the data can be fragmented in a distributed database. Explain with an example.   (8)

Or

(b) (i) Compare OODBMS with ORDBMS.   (8)

(ii) Explain the architecture of data warehousing in detail.   (8)

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