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B.E./B.Tech. DEGREE EXAMINATION, MAY/JUNE 2006.

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.   What are the main differences between a file-processing system and a DBMS?

2.   Define the concept of aggregation. Give two examples of where this concept is useful.

3.   List reasons why null value might be introduced into the database.

4.   State the various operators used in relational algebra.

5.   Why certain functional dependencies are called trivial functional dependencies?

6.   State the various pitfalls in relational database.

7.   What benefit does strict two-phase locking provide? What disadvantages result?

8.   List the ACID properties. Explain the usefulness of each.

9.   List out the reasons for the development of distributed database.

10. What motivated data mining? Why is it important?

PART B — (5 × 16 = 80 marks)

11. (i)   Explain the distinction among the terms primary key, candidate key, foreign key and super key with a suitable example.   (8)

     (ii) Explain clearly the steps involved in database development process while building an application.   (8)

12. (a) (i) Discuss the entity integrity and referential integrity constraints. Why each is considered important?

(6)

(ii) Consider the following relations.

(10)

Suppliers (sid : integer sname : string address : string)

Parts (pid : integer pname : string color : string)

Catalog (sid : integer pid : integer cost : real)

Write SQL statement for the following queries :

(1) Find the names of suppliers who supply some red part.

(2) Find the sids of suppliers who supply some red part or are at No : 1, Anna Salai.

(3) Find the sids of suppliers who supply every part.

(4) Find the pids of parts supplied by at least two different suppliers.

(5) Find the pids of the most expensive parts supplied by suppliers named Jothi.

Or

(b) (i) What are the various aggregate operators does the SQL support. Give a suitable example for each aggregate operator.

(8)

(ii) Justify the need for static SQL and dynamic SQL. Consider the relation STUDENT (rollno, name, marks, grade). Write embedded SQL statements in C language to retrieve all the student's records whose marks are more than 80.

(8)

13. (a) (i) State the goal of decomposition/normalization. Explain the different level of normalization with example.

(8)

(ii) Construct an ER diagram for a hospital with a set of patients and a set of medical doctors. Associate each patient with a log of the various tests and examinations conducted.

(8)

Or

(b) (i) Why is hash structure not the best choice for a search key on which range queries are likely?

(8)

(ii) What is the difference between primary index and secondary index?

(8)

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(a) (i) Explain in detail the four fundamental problems that occur if the transactions are not handled properly. (8)

(ii) Explain the distinction between the terms serial schedule and serializable schedule with suitable example. (8)

Or

(b) (i) What is locking? Explain the various locking techniques used to handle the concurrent SQL transaction for simultaneous users. Give examples for each locking. (8)

(ii) Explain the benefits of logical logging. Give examples of one situation where logical logging is preferable to physical logging and one situation where physical logging is preferable to logical logging. (8)

15. (a) (i) Compare OLAP and OLTP. (8)

(ii) What is star schema? Describe the multidimensional data model with a suitable example. (8)

Or

(b) (i) What are data fragmentations? Explain the various approaches for fragmenting a relation with example. (8)

(ii) Explain the need for object-oriented database with example. (8)

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