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Question Paper Code : 21305

B.E./B.Tech. DEGREE EXAMINATION, MAY/JUNE 2013.

Fourth Semester

Computer Science and Engineering

CS 2255/CS 46/CS 1254/10144 CS 406/
080250009 — DATABASE MANAGEMENT SYSTEMS

(Common to Information Technology)

(Regulation 2008/2010)

(Common to PTCS 2255 — Database Management Systems for B.E. (Part-Time) Third Semester — Computer Science and Engineering (Regulation 2009))

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Define Atomicity in transaction management.

2. Give example for one to one and one to many relationship.

3. What are primary key constrains?

4. Write the purpose of Trigger.

5. Define Boyce Codd Normal Form.

6. What is the need for Normalisation?

7. List ACID properties.

8. Define two phase locking.

9. What is the need for RAID?

10. What is the basic difference between static hashing and dynamic hashing?

PART B — (5 × 16 = 80 marks)

11. (a) Explain the purpose of database system.

Or

(b) Write about the structure of database system architecture with block diagram.

12. (a) Consider the following relational database

Employee (Employee – Name, Street, City)

Works (Employee – Name, Company-Name, Salary)

Company (Company-Name, City)

Manager (Employee-Name, Manager-Name)

Give an SQL DDL definition of this database. Identify referential integrity constrains that should hold, and include them in the DDL definition.

Or

(b) Consider the following relation

Employee (Employee-Name, Company-Name, Salary)

Write SQL for the following : (4 × 4 = 16)

(i) Find the total salary of each company

(ii) Find the employee name who is getting lowest salary

(iii) Find the company name which has lowest average salary

(iv) Find the employee name whose salary is higher than average salary of TCS.

13. (a) Consider the following relation

CAR-SALE (Car #, Data-Sold, Salesman #, Commission %, Discount-amount)

Assume that a car may be sold by multiple salesmen, and hence (Car #, Salesman #) is the primary key.

Additional dependencies are

Date-Sold → Discount-amt

and

Salesman # → Commission %

Based on the given primary key, is this relation in 1 NF, 2 NF, or 3 NF? Why or why not? How would you successively normalise it completely?

Or

(b) Explain the principles of

(i) Loss less join decomposition (5)

(ii) Join dependencies (5)

(iii) Fifth normal form. (6)

14. (a) Illustrate dead lock and conflict serializability with suitable example.

Or

(b) (i) Explain two phase commit protocol. (10)

(ii) Write different SQL facilities for recovery. (6)

15. (a) Construct B^+ tree to insert the following (order of the tree is 3)

26, 27, 28, 3, 4, 7, 9, 46, 48, 51, 2, 6.

Or

(b) Let relations $r_1(A,B,C)$ and $r_2(C,D,E)$ have the following properties : r_1 has 20,000 tuples, r_2 has 45,000 tuples, 25 tuples of r_1 fit on one block and 30 tuples of r_2 fit on one block. Estimate the number of block transfers and seeks required, using each of the following Join strategies for $r_1 \bowtie r_2$:

(i) Nested - loop join (4)

(ii) Block nested loop join (8)

(iii) Merge join. (4)
