Question Paper Code : 52858

B.E./B.Tech. DEGREE EXAMINATIONS, APRIL/MAY 2019.

Third/Fifth/Eighth Semester

Computer Science and Engineering

CS 6302 — DATABASE MANAGEMENT SYSTEMS

(Common to Mechanical and Automation Engineering/Mechatronics Engineering/Information Technology)

(Regulation 2013)

(Also common to PTCS 6302 – Database Management Systems for B.E. (Part-Time) - Second Semester – Computer Science and Engineering – Regulation 2014)

Time : Three hours   Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. What is a primary key? Give example.

2. Define denormalization.

3. What is data definition language?

4. Outline the use of commit and rollback.

5. Name the properties that must be satisfied by a transaction.

6. Outline the need for concurrency control.

7. State the difference between B tree and B⁺ tree indexing.

8. Define a data mart.

9. What is cryptography?

10. What is persistence in object oriented databases?

PART B — (5 × 13 = 65 marks)

11. (a) Explain select, project, Cartesian product and equality join in relational algebra with an example. (13)

Or

(b) Consider a relation $R(A, B)$. R is in first normal form. Justify R is in second normal form, third normal form and BCNF. (13)

12. (a) Consider the following relations:

EMPLOYEE (ENO, NAME, DATE_BORN GENDER,

DATE_OF_JOINING, DESIGNATION, BASIC_PAY, DNO)

DEPARTMENT (DNO, DNAME)

The primary key is underlined. Write SQL queries to perform the following :

(i) Display the employee number, name, department number and department name of all employees. (3)

(ii) List the details of employees who earn less than the average basic pay of all employees. (4)

(iii) List the department number and number of employees in each department. (4)

(iv) List the details of employees who work for DNO = 'CSE'. (2)

Or

(b) Outline the steps in query processing with a diagram and an example. (13)

13. (a) (i) Explain time stamp based concurrency control algorithm with an example. (6)

(ii) What is dead lock? Explain the four conditions for dead lock with an example. (7)

Or

(b) Outline the various problems that occur due to concurrent transactions. Also, outline the two phase locking protocol used for concurrency control with an example.

14. (a) (i) Outline static hashing and dynamic hashing with an example. (8)

(ii) Distinguish between primary index and secondary index. Give example. (5)

Or

(b) Pretest as outline of the following

(i) Distributed database management systems. (4)

(ii) Spatial databases. (5)

(iii) Data warehousing. (4)

15. (a) (i) What is database access control? Compare the processes of discretionary and mandatory access control mechanisms. (8)

(ii) Outline the structure of an XML document with an example. (5)

Or

(b) What is an object oriented database management system? Outline the characteristics of an object oriented database management system. (13)

PART C — (1 × 15 = 15 marks)

16. (a) Consider the following case study describing the academic functioning of a college:

• A college has many departments.

• A department would have many students as well as employs many faculty members

• A student can register into various courses; similarly a course can be registered by many students

• A student lives in a single hostel but a hostel accommodates many students

• A department offers many courses but a particular course is offerred by a particular department

• A faculty teaches many courses. A course is taught by many faculties.

Model a E-R diagram for the above scenario. (15)

Or

(b) Outline the steps in the Apriori algorithm for mining association rules with an example. (15)