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Question Paper Code : 77094

B.E./B.Tech. DEGREE EXAMINATION, APRIL/MAY 2015.

Third Semester

Computer Science and Engineering

CS 6302 — DATABASE MANAGEMENT SYSTEMS

(Common to Information Technology)

(Regulation 2013)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Write the characteristics that distinguish the Database approach with the File-based approach.
2. Define: Functional dependency.
3. State the need for Query Optimization.
4. What is the difference between Static and Dynamic SQL?
5. Write the ACID properties of Transaction.
6. Define: DDL, DML, DCL and TCL.
7. How dynamic hashing differ from Static hashing?
8. Write about the four types (Star, Snowflake, Galaxy and Fast constellation) of Data warehouse schemas.
9. Define Threats and risks.
10. What is Association rule mining?

PART B — (5 × 16 = 80 marks)

11. (a) Draw E-R diagram for the “Restaurant Menu Ordering System”, which will facilitate the food items ordering and services within a restaurant. The entire restaurant scenario is detailed as follows. The Customer is able to view the food items menu, call the waiter, place orders and obtain the final bill through the computer kept in their table. The Waiters through their wireless tablet PC are able to initialize a table for customers, control the table functions to assist customers, orders, send orders to food preparation staff (chef) and finalize the customer’s bill. The Food preparation staffs (Chefs), with their touch-display interfaces to the system, are able to view orders sent to the kitchen by waiters. During preparation, they are able to let the waiter know the status of each item, and can send notifications when items are completed. The system should have full accountability and logging facilities, and should support Supervisor actions to account for exceptional circumstances, such as a meal being refunded or walked out on. (16)

Or

- (b) State the need for Normalization of a Database and Explain the various Normal Forms (1st, 2nd, 3rd BCNF, 4th, 5th and Domain-Key) with suitable examples. (16)
12. (a) Consider a student registration database comprising of the below given table schema.

Student File

Student Number	Student Name	Address	Telephone
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Course File

Course Number	Description	Hours	Professor Number
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Professor File

Professor Number	Name	Office
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Registration File

Student Number	Course Number	Date
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Consider a suitable sample of tuples/records for the above mentioned tables and write DML statements (SQL) to answer for the queries listed below.

- (i) Which courses does a specific professor teach?
- (ii) What courses are taught by two specific professors?

- (iii) Who teaches a specific course and where is his/her office?
- (iv) For a specific student number, in which courses is the student registered and what is his/her name?
- (v) Who are the professors for a specific student?
- (vi) Who are the students registered in a specific course? (16)

Or

- (b) Discuss about the Join order optimization and Heuristic optimization algorithms. (16)

13. (a) Explain the Two-phase Commit and Three-Phase Commit Protocols. (16)

Or

- (b) Consider the following schedules. The actions are listed in the order they are scheduled, and prefixed with the transaction name.

S1: T1:R(X), T2:R(X), T1:W(Y), T2:W(Y), T1:R(Y), T2:R(Y)
 S2: T3:W(X), T1:R(X), T1:W(Y), T2:R(Z), T2:W(Z), T3:R(Z)

For each of the schedules, answer the following questions :

- (i) What is the precedence graph for the schedule? (2)
- (ii) Is the schedule conflict-serializable? If so, what are all the conflict equivalent serial schedules? (7)
- (iii) Is the schedule view-serializable? If so, what are all the view equivalent serial schedules? (7)

14. (a) With Suitable diagrams, discuss about the Raid Levels (Level 0, Level 1, Level 0+1, Level 3, Level 4 and Level 5). (16)

Or

- (b) Explain the Architectural components of a Data Warehouse and write about Data marts. (16)

15. (a) Neatly write the K-means algorithm and show the intermediate results in clustering the below given points into Two clusters using K-means algorithm.

P1 : (0,0), P2 : (1,10), P3 : (2,20), P4 : (1,15), P5 : (1000, 2000),
 P6 : (1500, 1500), P7 : (1000,1250). (16)

Or

- (b) Discuss about the Access control mechanisms and Cryptography methods to secure the Databases. (16)