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H 2422

B.E./B.Tech. DEGREE EXAMINATION, MAY/JUNE 2009.

Fourth Semester

Information Technology

IF 254 — DATABASE MANAGEMENT SYSTEM

(Common to Sixth Semester Mechatronics Engineering)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Mention two functions of database administrator.
2. Briefly explain the existence dependency of weak entity set.
3. What is attribute defined generalization? Give example.
4. Define BCNF.
5. What is equivalence rule?
6. Define schedules in transaction processing.
7. What are the basic steps involved in processing query.
8. Explain byte code enhancement in Java database objects.
9. What are the two types of transaction failure? Explain.
10. Define entropy measure?

PART B — (5 × 16 = 80 marks)

11. (a) (i) Narrate the advantages and disadvantage of database system. (8)
- (ii) Explain different level of data abstraction. (8)

Or

- (b) Consider a database used to record the details of a multiplex. Build an E-R diagram that models cinema hall, shopping mall, food court etc. as separate relational model. Identify the entities (at least 5) in each of the E-R diagram, and use a ternary relationship for the database suitably. (16)

12. (a) Consider the following relational database:

Professor (**prof name**, dept_name, salary, street, city)
committee (**comm name, prof name**)
department (**dept name, build-name**, no-of staff)

Write a relational algebra expression for the following queries:

- Find the names of all professor who are in the committee of prof Tiwari.
- Find the names and address of all professor who live in adyar.
- Find the names of all professor who are in exactly the same committee (neither more nor less) that prof Raj is in.
- Give all professors a 10 percent salary raise.
- Delete all tuples in the relation professor who work in the department Placement Cell.
- Find all the professors who have offices in at least all those buildings that Professor anbu has offices in. (16)

Or

- (b) (i) Define fourth normal form. Why is it useful? (4)
(ii) Why is the domain key normal form (DKNF) known as the ultimate normal form. (4)
(iii) What is a functional dependency? Explain minimal set of functional dependencies. (8)
13. (a) (i) Explain the working of query optimizer with a block diagram. (8)
(ii) Discuss the issues in implementing optimization strategies for the JOIN queries. (8)

Or

- (b) Narrate how time based protocol is used for concurrency control. (16)
14. (a) (i) What are temporal database? Explain its significance in real world. (8)
(ii) Describe the key elements of parallel database processing. (8)

Or

- (b) (i) What is spatial database query? Explain the techniques involved in it. (10)
- (ii) Why is content based retrieval more popular in multimedia database? (6)
15. (a) (i) A car rental company maintains a vehicle database for all vehicles in its current fleet. For all vehicles, it includes the vehicle identification number, license number, manufacturer, model, date of purchase, colour and special data are included for certain types of vehicle:
- Trucks: cargo capacity
 - Sports car: horsepower, renter age requirement.
 - Vans: number of passengers.
 - Off-road vehicles: ground clearance, drive train (four-or two-wheel drive).
- Construct an object-oriented database schema definition for this database. Use inheritance where appropriate. (12)
- (ii) List the features of object oriented DBMS. (4)

Or

- (b) (i) Explain the data warehouse architecture with neat diagram. (12)
- (ii) Explain the process of knowledge discovery in database. (4)