S 9100

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 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 does Data model mean?

2. Define a Data Dictionary?

3. Define Data Manipulation Language.

4. What does Logical Data Independency mean?

5. What are the Pitfalls in relational database design?

6. Write the advantages of pipelining.

7. What is referential integrity?

8. What does time to commit mean?

9. What are the various approaches of persistence of objects?

10. Differentiate Homogenous and Heterogenous Databases with reference to Distributed Databases.

PART B — (5 × 16 = 80 marks)

11. (a) (i) Discuss the DBMS Architecture and explain Data Independence? (10)

(ii) Discuss Database Modeling. (6)

Or

(b) (i) Explain the layered view architecture. (8)

(ii) Name any four commercial relational databases and highlight their features. (8)

12. (a) Write notes on :

(i) Relationships. (3)

(ii) Constraints on relationships. (3)

(iii) Relationship with roles. (3)

(iv) Multiway relationships. (3)

(v) Converting Multiway Relationships to Binary. (4)

Or

(b) Describe the operations of relational algebra.

13. (a) Consider the university schema. Discuss the classes needed and the operations needed for the classes. Name the object oriented concepts involved.

Or

(b) Suppose we have the following requirements for a university database that is used to keep track of students transcripts :

(i) The university keeps track of each student's name (SNAME), student number (SNUM), social security number (SSSN), current address (SCADDR) and phone (SCPHONE), permanent address (SPADDR) and phone (SPPHONE), birthdate (BDATE), sex (SEX), class (CLASS) (freshman, sophomore, ..., graduate), major department (MAJORDEPTCODE), minor department (MINORDEPTCODE) (if any), and degree program (PROG) (B.A., B.S., ..., Ph.D.). Both ssn and student number have unique values for each student.

(ii) Each department is described by a name (DEPTNAME), department code (DEPTCODE), office number (DEPTOFFICE), office phone (DEPTPHONE), and college (DEPTCOLLEGE). Both name and code have unique values for each department.

(iii) Each course has a course name (CNAME), description (CDESC), code number (CNUM), number of semester hours (CREDIT), level (LEVEL), and offering department (CDEPT). The value of code number is unique for each course.

(iv) Each section has an instructor (INSTUCTORNAME), semester (SEMESTER), year (YEAR), course (SECCOURSE), and section number (SECNUM). Section numbers distinguish different sections of the same course that are taught during the same semester/year; its values are 1, 2, 3, ...; up to the number of sections taught during each semester.

(v) A transcript refers to a student (SSSN), refers to a particular section, and grade (GRADE). Design an relational database schema for this database application. First show all the functional dependencies that should hold among the attributes. Then, design relation schemas for the database that are each in 3NF or BCNF. Specify the key attributes of each relation. Note any unspecified requirements, and make appropriate assumptions to make the specification complete. (16)

14. (a) Discuss Concurrency Control Techniques. (16)

Or

(b) Describe the Transaction Processing Concepts. (16)

15. (a) Data mining refers to "using a variety of techniques to identify nuggets of information or decision-making knowledge in bodies of data, and extracting these in such a way that they can be put to use in the areas such as decision support, prediction, forecasting and estimation. The data is often voluminous, but as it stands of low value as no direct use can be made of it; it is the hidden information in the data that is useful" — Validate? (16)

Or

(b) Discuss in detail object oriented databases. (16)