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(Following Paper ID and Roll No. to be filled in your Answer Book)

PAPER ID : 1464 Roll No.

M. B. A.

(SEM. IV) EXAMINATION, 2006-2007

DATABASE MANAGEMENT SYSTEM

Time : 3 Hours] *[Total Marks : 100*

Note : *Attempt **all** questions.*

1 Attempt any **two** parts of the following : **5×2**

(a) Define the following terms:

(i) Data model

(ii) Referential integrity

(iii) External schema

(iv) Internal schema

(v) Primary key.

(b) When is the concept of weak entity used in data modelling? Define the terms owner entity, weak entity, identifying relationship, partial key. **10**

(c) A university database contains information about professors (identified by social security number) and courses (identified by courseid). Professors teach courses; each of the following situations concerns the Teaches relationship set. For each situation draw an ER diagram. **5×2**

(i) Professors can teach the same course in several semesters and each offering must be recorded.

(ii) Professors can teach the same course in several semesters, and only the most recent such offering needs to be recorded.

(iii) Every professor must teach some course.

(iv) Every professor teaches exactly one course.

(v) Every professor teaches exactly one course and every course must be taught by some professor.

2 Attempt any **two** parts of the following : **3+3+4**

(a) Specify the following queries in relational algebra :

Supplier (sid, sname, address)
Part (sid, pname, color)
Catalog (sid, pid, cost)

(i) Find names of suppliers who supply some red or green part.

(ii) Find the sids of suppliers who supply every part.

(iii) Find the sids of suppliers who supply red and green parts.

(b) List the operations of relational algebra and the purpose of each. **10**

(c) Let the following relational schema be given : **3+3+4**

Employee (SSN, name, age, dno)

salary (SSN, salary)

work_on (Project#, SSN)

Project (Project#, project_name, location)

For each of the following queries give an

expression in SQL :

(i) Display the names of projects at "delhi".

(ii) Find the project_name of employee whose salary is greater than 10000.

(iii) Retrieve the name and SSN of employees working on Project#A100.

3 Attmept any **two** parts of the following : **5×2**

(a) Define the following terms:

(i) Multivalued dependency

(ii) Functional dependency

(iii) Second Normal form.

(iv) Lossless decomposition

(v) Dependency preservation.

(b) Consider the following relation: 2x5

Book (book_title, authorname, book_type, listprice, author_affiliation, publisher)

Suppose the following functional dependencies exist:

book_title → publisher, book_type

book_type → listprice

authorname → author_affiliation.

(i) What normal form is the relation in? Explain your answer.

(ii) Apply normalization until you cannot decompose the relations further. State the reasons behind each decomposition.

(c) How does Boyce-Codd normal form differ from 3NF? Why is it considered stronger from of 3NF? **10**

4 Attempt any **two** parts of the following : **2×5**

(a) Explain the following terms :

(i) Deadlock detection and recovery

(ii) Shadow paging.

(b) Define serializability. Differentiate conflict and view serializability. **10**

(c) State with examples desirable properties of a transaction. What is the system log used for? **10**

5 Write short notes on any **two** parts of the following :

(a) Two phase locking **10**

(b) Need for concurrency control **10**

(c) Multiversion techniques. **10**