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CS-15

00232

MCA (III Year)

Term-End Examination

June, 2010

CS-15 : RELATIONAL DATABASE MANAGEMENT SYSTEM

Time : 3 hours *Maximum Marks : 75*

Note : *Question number 1 is* ***compulsory****. Answer* ***any three*** *questions from the rest.*

1. (a) Consider the following relational database : **15**

EMPLOYEE (e_name, street, city)

WORKS (e_name, C_name, salary)

COMPANY (c_name, city)

MANAGES (e_name, m_name)

e_name stands for employee name, c_name stands for company name and m_name stands for manager name.

For each of the following queries, give the relational algebraic expression and relational calculus expression :

(i) Find the names of all employees who work for ABC corporation.

(ii) Find the names of all employees who live in the same city where the company for which they work is located.

(iii) Find the names of those employees of the ABC corporation who earn the same salary.

(iv) Find the name, street and city of those employees who work for the ABC corporation and earn more than Rs. 5,00,000/- per annum.

(v) Find the names of managers who work in the XYZ corporation located in Shimla.

(b) Explain multi - valued dependency with the help of an example. How is it related to normalization ? Explain it with the help of an example. 7

(c) Explain the following with the help of an example each : 8

(i) Two - phase locking

(ii) Redo in Database recovery

(iii) Authorisation matrix

(iv) Serialisability

2. (a) "The algorithm to detect a deadlock is based on the detection of a circular chain in the wait - for - graph". With the help of an example, explain the deadlock detection algorithm. 5

(b) Describe normalization using join dependency, with the help of an example. 6

(c) What is the role of database statistics in Query evaluation ? Explain with the help of an example. 4

3. (a) A relational database consists of the following relations about students in an institute. 6

STUDENT (ENROLNUM#, STUDENT_NAME, ADDRESS, AGE)

DEPARTMENT (DEPT_NAME, COURSE#, TEACHER)

TIME TABLE (COURSE#, SUBJECT_NAME, SEMESTER, TIME, ROOM#)

PERFORMANCE (ENROLNUM#, COURSE#, GRADE)

Write a program in embedded SQL to get the names of all those students who have secured 'A' grade in a course offered by the computer firm Department in the second semester.

(b) Define indices and their advantages in RDBMS. Explain the comments of clustering and hashing indices, using an example of each. 6

(c) Explain the concept of Referential Integrity with the help of an example. 3

4. Explain the following terms : 15

(a) Physical data independence

(b) Aggregation in the context of E - R diagram

(c) Audit trails

(d) Distributed locking

(e) Domain integrity

5. (a) With the help of an example, explain redundancy, update anomalies, insertion anomalies and deletion anomalies. 4

(b) Explain the working of the index sequential file organization with a suitable diagram. 6

(c) Explain the term functional dependence with the help of an example. Explain with the help of an example how FDS can be used for lossless join and dependency preserving decomposition of a relation. 5
