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Roll No.....

IT-225

B.E. IV Semester

Examination, June 2017

Choice Based Credit System (CBCS)
Database Management System

Time : Three Hours

Maximum Marks : 60

Note: i) Attempt any five questions.

ii) All questions carry equal marks.

1. a) Explain the responsibilities of the DBA and the database designers?

   b) Define the following terms:

      i) Entity

      ii) Attribute

      iii) Multi valued Attribute.

2. a) What do you mean by Database Management system? Explain the various advantages of using a Database Management System?

   b) Discuss the entity integrity and referential integrity constraints. Why is each considered important?

3. a) Draw an E-R diagram for the hospital management system. Assume your own entities (Minimum of 5 entities), attributes and relations. Explain in detail.

   b) Discuss the different relational algebra operations.

4. a) With an example explain clearly JOIN and UNION operations in relational algebra. Bring out the difference between natural JOIN and OUTER JOIN.

   b) Consider the following relations for a database that keeps track of business trips of sales persons in a sales office:

      Salesperson (Salespersonid, Name, Start-year, Dept-no)

      Trip (Salespersonid, from, to, Departure-date, Return-date, trip-id)

      Expense (trp-id, Account No., Amount)

      Specify the foreign keys for the above schema. Then specify the following queries in

      Relational algebra.

      i) Give the details (all attributes of trip relation) for trip that exceeded 10,000/- in expenses.

      ii) Print the 'Salespersonid' and 'Name' of the salespersons who took trips to 'delhi'.

      iii) Print the total trip expenses incurred by the salesman with Salespersonid = '504'.

5. a) Consider the universal relation R = {A, B, C, D, E, F, G, H, I, J} and the set of functional dependencies

      F = { {A, B} -> {C}, {A} -> {D, E}, {B} -> {F}, {F} -> {G, H}, {D} -> {I, J} }

      What is the key for R? Decompose R into 2NF, then 3NF relations.

b) Consider the following schema for a company database

Employee (Name, SSN, Address, Sex, Salary, Dno)

Department (Dname, Dnumber, MGRSSN, MGRSTART Date)

Dept-Locations (Dnumber, Dlocations)

Project (Pname, Pnumber, Plocations, Dnum)

Works-On (ESSN, PNo, Hours)

Dependent (ESSN, Dependent-name, Sex, Bdate, Relationship)

Give the queries in SQL

i) Retrieve the names and address of employees who work for "Research" Department.

ii) List all the project names on which employee "Smith" is working.

iii) Retrieve all employees who either work in department 4 and make over 25000 per year or work in department 5 and make over 30,000.

iv) Retrieve the SSN of all employees who either work in department 5 or directly supervise an employee who works in department number.

6. a) Define BCNF. How does it differ from 3NF? What is it considered a stronger from of 3NF? Explain with neat diagram.

b) Explain each of the following with example:

i) First Normal Form

ii) Second Normal Form

iii) Third Normal Form

a) What is Serialisability? How can Serialisability be ensured? Do you need to restrict.

b) Given below are two sets of FDs for a relation R(A,B,C,D,E). Are they equivalent)

i) $A -> B, AB -> C. D -> AC, D -> E$

ii) $A -> BC, D -> AE$

a) Explain how strict 2-phase locking is implemented. Show them with an example.

b) Concurrent execution of transaction to ensure Serialisability? Justify your answer. Give an example of transactions and how you can force Serialisability in those transactions.

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