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13MCA25

Second Semester MCA Degree Examination, Dec.2014/Jan.2015

Database Management Systems

Time: 3 hrs.

Max. Marks: 100

Note: Answer any FIVE full questions.

- 1 a. Explain four characteristics of database approach in comparison with traditional file processing approach. (08 Marks)
- b. Describe three-schema architecture of DBMS with a diagram. (08 Marks)
- c. Discuss different types of DBMS interfaces. (04 Marks)

- 2 a. Explain client/server architecture of DBMS and discuss different types of client/server architecture with diagram. (10 Marks)
- b. What are the different types of attributes in E-R model? Explain with example for each. (06 Marks)
- c. What is weak entity type? Explain in brief with example. (04 Marks)

- 3 a. Design an ER diagram for car insurance company according to the requirements mentioned below:
 - i) The company keep track of customer information like id, name, address and phone.
 - ii) Company stores the details of cars like registration number, engine number, model, price color etc. that is owned by customers.
 - iii) Company records accidents (if any) that each car has made using the attributes like accident identifier, location, time and date of accident.
 - iv) Company also maintains the license information of customers i.e., license number, issue date and expiry date.
 - v) Mention the appropriate participation constraints and cardinality ratios. (10 Marks)
- b. Explain ER to relational mapping with suitable example. (10 Marks)

- 4 a. Consider the following relational schema and answer the following queries using relational algebra.

DEPARTMENT (Dnumber, Dname, MgrSSN, MgrStratdate)

Project (Pnumber, Pname, Plocation, DNumber)

Employee (SSN, name, Bdate, addr, Sex, Salary, Super SSN, Dno).

 - i) Retrieve the name and address of all employees who work for 'accounts' department.
 - ii) Retrieve department number, number of employees and their average salary.
 - iii) Retrieve the name and salary of the manager of each department.
 - iv) List the name and the location of the projects not controlled by department number '2'.
 - v) Retrieve all employees information who either work in department '1' and make over ₹ 20000 or work in department '3' and make over ₹ 29000. (10 Marks)
- b. Explain JOIN operations in SQL and discuss different types of JOIN with example for each. (10 Marks)

- 5 a. Explain SELECT, PROJECT and RENAME operations in relational modeling with example for each. (06 Marks)
- b. Explain GROUP BY and HAVING clause with example. (04 Marks)
- c. Consider the following relational schema:
 Student (Sid, Sname, Major, GPA)
 Faculty (Fid, Fname, Dept, Designation, Salary)
 Course (Course_id, Cname, Fid)
 Enroll (Course_id, Sid, Grade)
- Write the SQL queries for the following:
- i) List the names of all students enrolled for the Course_id "MCA".
- ii) List all the Department having an average salary of above 10000 rupees.
- iii) Give a 20% salary raise to all faculties.
- iv) List the names of all faculty members beginning with 'P' and ending with letter 'A'.
- v) For each course, retrieve the Course_id and the number of students enrolled for each course. (10 Marks)
- 6 a. Define functional dependency. Explain 1NF, 2NF and 3NF with example for each. (09 Marks)
- b. Explain update anomalies with example. (06 Marks)
- c. Explain BCNF with example. (05 Marks)
- 7 a. What are procedures and functions in PL/SQL? Explain with example. (08 Marks)
- b. Explain WHILE loop and FOR loop in PL/SQL with example for each. (06 Marks)
- c. Explain logical blocks of PL/SQL program using an example program. (06 Marks)
- 8 Write short notes on:
- a. Constraints on relationship type. (06 Marks)
- b. Embedded SQL. (04 Marks)
- c. Alter Command in SQL. (04 Marks)
- d. Actors on the scene. (06 Marks)
