Roll No .....

MCA - 202

MCA. II Semester Examination, June 2014

Database Management System

Time : Three Hours

Maximum Marks : 70

Note: i) Answer five questions. In each question part A, B, C is compulsory and D part has internal choice.
ii) All parts of each question are to be attempted at one place.
iii) All questions carry equal marks, out of which part A and B (Max. 50 words) carry 2 marks, part C (Max. 100 words) carry 3 marks, part D (Max. 400 words) carry 7 marks.
iv) Except numericals, Derivation, Design and Drawing etc.

Unit - I

1. a) What is the primary goal of a DBMS? 2
   b) What are the five main functions of a database administrator? 2
   c) Define data independence. What are the two levels of data independence? 3
   d) Construct an E-R diagram for a car-insurance company whose customers own one or more cars each. Each car has associated with it zero to any number of recorded accidents. 7

OR

Differentiate between
i) Weak and strong entity set
ii) Specialization and Generalization 7

Unit - II

2. a) List two reasons why we may choose to define a view. 2
   b) List two reasons why null values might be introduced into the database. 2
   c) Differentiate between Super key, Candidate key and Primary key. 3
   d) Consider the relational database 7

employee (person-name, street, city)
works (person-name, company-name, salary)
company (company-name, city)
manages (person-name, manager-name)

Give an expression in the relational algebra to express each of the following queries:
i) Find the names of all employees who work for ABC corporation.
ii) Find the names of all employees in this database who live in the same city as the company for which they work.
iii) Find the names of all employees in this database who do not work for ABC corporation.
iv) Find the names, street address, and cities of residence of all employees who work for ABC corporation and earn more than Rs. 1,00,000 per annum.

OR

Consider the relational database of -
employee (employee-name, street, city)
works (employee-name, company-name, salary)
company (company-name, city)
manages (employee-name, manager-name)
Give an expression in SQL for each of the following queries-
i) Modify the database so that Anil now lives in Delhi.
ii) Give all employees of ABC corporation a 10 percent raise in salary.
iii) Give all managers of ABC corporation a 10 percent raise in salary.
iv) Delete all tuples in the *works* relation for employees of ABC corporation. 7

Unit - III

3. a) List the three design goals for relational databases. 2
   b) Define functional dependency. 2
   c) Why is 4NF preferred to BCNF? 3
   d) Explain the process of normalization. What are the different normal forms? 7

OR

Given R(A,B,C,D,E) with the set of FDs,
$F\{AB \rightarrow CD, ABC \rightarrow E, C \rightarrow A\}$
i) Find any two candidate keys of R
ii) What is the normal form of R? Justify. 7

Unit - IV

4. a) What is the purpose of the checkpoint mechanism? How often should checkpoints be performed? 2
   b) Discuss the relative advantages of centralized and distributed databases. 2
   c) List all possible sequences of states through which a transaction may pass. 3
   d) Compare the deferred-and immediate-modification versions of the log-based recovery scheme in terms of ease of implementation and overhead cost. 7

OR

Explain deadlock prevention schemes. 7

Unit - V

5. a) Define a data-warehouse. 2
   b) What is the primary advantage of indices? Write one difference between a primary index and secondary index? 2
   c) Differentiate between B-tree and B+tree. 3
   d) Explain the issues that have to be addressed if multimedia data is stored in a database. 7

OR

Write a short note on RAID. 7

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