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10MCA34

Third 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. Define database. Discuss the advantages of DBMS over the traditional file management systems. (10 Marks)
- b. With neat diagram, explain the database system environment. (10 Marks)
2. a. What is an attribute? With suitable examples, explain the different types of attributes. (10 Marks)
- b. Design an ER diagram for a company database. (05 Marks)
- c. Explain the constraints on relationship types. (05 Marks)
3. a. Explain the relational algebra operations from set theory with proper examples. (07 Marks)
- b. Explain the characteristics of a relation. (05 Marks)
- c. Consider the following scheme:
EMP (Fname, Lname, SSN, Bdate, Address, Sex, Salary, SuperSSN, DNo)
DEPT (Dname, Dnumber, MgrSSN, MgrStartdate)
DEPT_LOC (Dnumber, Dloc)
PROJECT (Pname, Pnumber, Ploc, Dnum)
WORK_ON (ESSN, PNo, Hours)
- Give the relational algebra expression for the following:
- i) List all male employees who belongs to Dept = 5 and earns more than 30,000
- ii) Retrieve the name of the manager of each department.
- iii) Retrieve the name and address of all employees who work for the 'HR' department.
- iv) List the details of 'Gaming' department. (08 Marks)
4. a. Explain aggregate functions in SQL with examples. (10 Marks)
- b. What is embedded SQL? Explain. (05 Marks)
- c. Explain the concept of views in SQL. (05 Marks)
5. a. Explain the informal guidelines for relation schemas. (10 Marks)
- b. What is the need for normalization? Explain with example, the first and second normal forms. (10 Marks)
6. a. What is transaction? Explain ACID properties of a transaction. (10 Marks)
- b. Explain strict 2PL. (07 Marks)
- Briefly explain ARIES recovery algorithm. (03 Marks)
7. Write short notes on the following:
- a. Characteristics of database approach
- b. Data independence
- c. 3-schema architecture
- d. Boyce-Codd Normal form. (20 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and/or equations written eg. 42+8 = 50, will be treated as malpractice.

8 Consider the following book dealer database:

AUTHOR (Author_id, Name, City, Country)

PUBLISHER (Publisher_id, Name)

CATALOG (Book_id, Book_title, Author_id, Publisher_id, Price)

ORDER_DETAILS (Order_No, Book_id, Quantity)

Create the above tables by properly specifying the primary and foreign keys. Price in the CATALOG table should not exceed ₹250 and Order_no format in Order_detail table should begin with 'O' (ie: 'O128')

(12 Marks)

b. Modify the publisher table and add a new field 'city'.

(02 Marks)

c. Find how many books of 'Chetan Bhagat' were sold altogether.

(03 Marks)

d. List the names of all books published from 'Delhi'.

(03 Marks)
