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## Fifth Semester B.E. Degree Examination, December 2011

### Database Management Systems

Time: 3 hrs.

Max. Marks:100

- Note: 1. Answer any FIVE full questions, selecting at least TWO questions from each part.**  
**2. For SQL and relational algebra queries refer appropriate tables given at the end of paper.**

#### PART – A

- 1
  - a. Discuss the various component modules of a DBMS with a neat diagram. (08 Marks)
  - b. Briefly explain the advantages of object oriented systems. (05 Marks)
  - c. List and explain the main characteristics of database approach. (07 Marks)
  
- 2
  - a. Define and explain a partial key, with an example. (04 Marks)
  - b. What is meant by recursive relationship? Bring out the importance of role names in recursive relationship, with an example. (06 Marks)
  - c. Design an ER diagram for maintaining a movie database taking into account atleast four entities. (10 Marks)
  
- 3
  - a. Explain foreign key and its importance. Can a foreign key exist, only for a single table? Explain. (05 Marks)
  - b. How can an intersection operator be implemented using union and minus operator?(03 Marks)
  - c. Write queries in relational algebra for the following :
    - i) Retrieve the number of dependents for an employee named "Ram"
    - ii) Retrieve the name of managers working in location named "XYZ" who has no female dependents.
    - iii) Retrieve the name of employee who works in the same department as that of "Raj". (12 Marks)
  
- 4
  - a. Explain all possible options that can be specified when a referential integrity constraint is violated using suitable example for all options. (08 Marks)
  - b. Write queries in SQL for the following. Refer the relations at the end of the question paper :
    - i) Retrieve the name of the employee who gets second highest salary
    - ii) For each department that has more than five employees, retrieve the department number and the number of its employees who have salary more than Rs.5000.
    - iii) Retrieve the name of employees whose salary is greater than all the employees working in either department 5 or 6. (12 Marks)

#### PART – B

- 5
  - a. Discuss the significance of an assertion. Write an assertion to specify a constraint such that the salary of an employee must not be greater than the salary of the manager of the department that the employee works for in SQL. (08 Marks)
  - b. What is meant by impedance mismatch? Explain. (06 Marks)
  - c. Create a view which will display the department name, number of employees working and total salary for each department. (06 Marks)

- 6 a. Suggest and explain three different techniques to achieve 1NF using a suitable example. (08 Marks)
- b. Differentiate between prime and non-prime attribute, with an example. (04 Marks)
- c. Consider the relation  $R(A, B, C, D, E, F)$  and the FD  $A \rightarrow B, C \rightarrow DF, AC \rightarrow E, D \rightarrow F$ . What is the key and highest normal form of R? If it is not in 3NF find a decomposition that is lossless and dependency preserving? (08 Marks)
- 7 a. Which normal form is based on the concept of multi valued functional dependency? Explain the same with an example. (10 Marks)
- b. Explain two phase locking protocol and its disadvantages. (10 Marks)
- 8 Write short notes on :
- a. Tune stamp ordering algorithm
- b. ARIES algorithm
- c. Embedded SQL
- d. Fifth normal form. (20 Marks)

**Tables/Relations :**

Employee (Name, SSN, Salary, Super SSN, DNo)

Department (DNum, DName, Mgr SSN)

Dept-Locations (DNum, Dlocation)

Work ON (ESSN, PNo, Hours)

Dependent (ESSN, Dep Name, Sex)

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