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10CS54

Fifth Semester B.E. Degree Examination, Dec.2018/Jan.2019
Database Management System

Time: 3 hrs.

Max. Marks: 100

Note: Answer any FIVE full questions, selecting atleast TWO questions from each part.

PART – A

- 1
 - a. Define Database Management System. Write a note on Actors on the Scene and workers behind the scene. (10 Marks)
 - b. Define Data Model. Write a neat diagram of Three – Schema Architecture. (06 Marks)
 - c. Define Logical and Physical data Independence. (04 Marks)

- 2
 - a. Discuss the role of a high – level conceptual data model in the database design process. (10 Marks)
 - b. Design an E – R diagram for University database. Consider minimum five entities and indicate Cardinality ratio. (10 Marks)

- 3
 - a. List important characteristic of Relations. (04 Marks)
 - b. Which constraint is violating for the below operations :
 - i) Insert < 'Arun' , 'K' , 'Sharma' , NULL , '10-8-1990' , '# 123, 3rd main' , 'm' , 20000 , NULL , 4> into EMPLOYEE.
 - ii) Delete the EMPLOYEE tuple with SSN = '123'.
 - iii) Update the DNO of the EMPLOYEE tuple with SSN = 123 to 1. (06 Marks)
 - c. Consider the schema given below and answer the Queries using Relational algebra operators.

EMPLOYEE (FN, MI, LN, SSN, Address, B_date, Sex, Salary, SuperSSN, DNO)
 DEPARTMENT (Dname, Dnumber, MgrSSn, Mgr_Start_date)
 DEPT_LOCATION (Dnumb, Dlocation)
 PROJECT (Pname, Pnumber, Plocation, Dnum)
 WORKS_ON (WSSN, PNO, HOURS)
 DEPENDENT (DSSN, Dependent_name, D_sex, Dep_B_date, Relationship)

 - i) Retrieve the name, address, salary of employees who work for 'Research department'.
 - ii) Find the names of employees who work on all projects controlled by Department Number 4.
 - iii) Retrieve the SSN of all employees who either work in department No : 4 or directly supervise an employee who work in dept number 4.
 - iv) Retrieve the names of employees who have no dependents.
 - v) Retrieve each department number, the number of employees in the department and their average salary. (10 Marks)

- 4
 - a. Write the syntax of the following :
 - i) CREATE
 - ii) ALTER
 - iii) DROP
 - iv) SELECT
 - v) INSERT (10 Marks)

- b. Consider the schema in 3(c) and answer the Queries using SQL commands.
- Retrieve sum of salary of all employees.
 - Find all employees who were born during 1990s.
 - Retrieve the names of all employees who do not have supervisors.
 - Retrieve the name of each employee who has a dependent with same name and sex of the employee.
 - Find the maximum and minimum salary of the employees working in 'Admin department'.
- (10 Marks)

PART – B

- 5 a. Write short notes on :
- Constraints as Assertion and Trigger
 - Virtual tables.
- (10 Marks)
- b. Explain Embedded SQL and Dynamic SQL. (10 Marks)
- 6 a. List and explain the four Informal design guidelines for Relation schemas. (10 Marks)
- b. Define Functional Dependency. Explain 1 NF , 2 NF with an example. (10 Marks)
- 7 a. Define Boyce – Codd Normal Form. Explain 4 NF and 5 NF. (10 Marks)
- b. Write a note on :
- Discretionary Access Control
 - Mandatory Access Control.
- (10 Marks)
- 8 a. Explain four important properties of Transaction. (10 Marks)
- b. Write a note on :
- 2 PL
 - ARIES.
- (10 Marks)
