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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 EMPLOPYEE.
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.
 i) Retrieve sum of salary of all employees.
 ii) Find all employees who were born during 1990s.
 iii) Retrieve the names of all employees who do not have supervisors.
 iv) Retrieve the name of each employee who has a dependent with same name and sex of the employee.
 v) Find the maximum and minimum salary of the employees working in 'Admin department'. **(10 Marks)**

PART – B

5 a. Write short notes on :
 i) Constraints as Assertion and Trigger ii) 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 :
 i) Discretionary Access Control ii) Mandatory Access Control. **(10 Marks)**

8 a. Explain four important properties of Transaction. **(10 Marks)**
 b. Write a note on :
 i) 2 PL ii) ARIES. **(10 Marks)**

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