USN

Fifth Semester B.E. Degree Examination, June/July 2023
Database Management Systems

Time: 3 hrs.   Max. Marks:100

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

PART – A

1 a. Briefly discuss the advantages of using the DBMS. **(10 Marks)**
   b. With neat diagram, explain three Schema Architecture. **(06 Marks)**
   c. What are the responsibilities of Database Administrators? **(04 Marks)**

2 a. List the summary of notations used for ER diagrams. Include symbols used in ER diagrams and their meanings. **(10 Marks)**
   b. Write an ER diagram for Banking System. Assume your own entities (minimum entities) attributes and relations. Mention Cardinality ratio. **(10 Marks)**

3 a. Consider the following schema for a Company database :
   Employee (Name , SSN, Address, Sex, Salary, D.No)
   Department (Dname, Dnumber, MGR_SSN , MGR_START_DATE)
   Dept_Locations (Dnumber, Dlocations)
   Project (Pname, Pnumber, Plocation, Dnum)
   Works_on (ESSN , PNo, Hours)
   Dependent (ESSN, Dependent_name, Sex, Ddate, Relationship)
   Write the Queries in Relational Algebra to :
   i) List the names of Managers who have atleast one dependent.
   ii) Find the names of the Employees who work on all Projects controlled by dept_number 6
   iii) Retrieve the name and address of all Employees who work for the Research department.
   iv) Retrieve the names of Employees who have no dependents. **(12 Marks)**
   b. Discuss the following relational algebra operations. Illustrate with an example :
   SELECT , UNION , DIFFERENCE , INTERSECTION. **(08 Marks)**

4 a. Explain all possible options that can be specified when a referential integrity is violated using suitable example for all options. **(08 Marks)**
   b. Consider the following relation for Company data base :
   Employee (Name , SSN , Salary , Super_SSN , DNo)
   Department (Dnum , DName , Mgr_SSN)
   Dept_Locations (DNum, Dlocations)
   Work_ON (ESSN , PNO , Hours)
   Dependent (ESSN , Dep_Name, Sex)
   Write queries in SQL for the following :
   i) Retrieve the name of each Employee who works on all the projects controlled by department number 9.
   ii) List the names of Manager who have atleast one dependent.
   iii) Each department that has more than five Employees retrieve the department_number and the number of its Employees who are making more than Rs 40,000. **(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. Explain DROP and DELETE command with an example. **(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. What is the need for normalization? Explain the first, second and third normal forms with example. **(10 Marks)**
   b. What is a Functional Dependency? Write an algorithm to find a minimal cover for a set of functional dependencies. **(10 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 advantages. **(10 Marks)**

8 a. Explain the problems that can occur when concurrent transactions are executed. Give examples. **(10 Marks)**
   b. What is a Schedule? Explain with examples, Serial , Non Serial and Conflict Serializable Schedules. **(10 Marks)**

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