USN

Third Semester MCA Degree Examination, Dec.2019/Jan.2020
Database Management System

Time: 3 hrs.   Max. Marks: 100

Note: *Answer any FIVE full questions, choosing ONE full question from each module.*

Module-1

1   a. Define DBMS. Discuss the main characteristics of the database approach and how it differs from traditional file system.   **(10 Marks)**
    b. Discuss the main activities of Actors on the scene and workers behind the scene.   **(10 Marks)**

OR

2   a. With a neat diagram, explain the three – schema architecture of DBMS.   **(06 Marks)**
    b. Discuss database languages and interfaces.   **(08 Marks)**
    c. What is Entity type , Entity set? Explain the difference between entity, entity type and entity set.   **(06 Marks)**

Module-2

3   a. Discuss the characteristics of relations.   **(10 Marks)**
    b. Discuss the entity integrity and referential integrity constraints in detail. **(10 Marks)**

OR

4   a. Explain the following   :   i) SELECT   ii) PROJECT   iii)   RENAME
       iv)   Cartesian Product   v) DIVISION operation.   **(12 Marks)**
    b. Consider the following relational schema and answer the following queries using relational algebra
       DEPARTMENT (Dnumber , Dname , MgrSSN , MgrStartDate)
       PROJECT (Pnumber , Pname, Plocation , Dnumber)
       EMPLOYEE (SSN , Name , Bdate , Addr , Sex , Salary , SuperSSN, DNumber)
       DEPENDENT (ESSN , Dependent_name , Sex , Bdate , Relationship)
       i)   Retrieve the name and address of all employees who work for account department.
       ii) Retrieve the department number, number of employees and their average salary.
       iii) Retrieve the name and salary of the manager of each department.
       iv) List the names of managers who have atleast one dependent.   **(08 Marks)**

Module-3

5   a. Define SQL data definition and data types in brief and explain with example, Aggregate functions.   **(10 Marks)**
    b. Explain the different clauses of SELECT – FROM – WHERE – GROUP – HAVING with an example for each.   **(10 Marks)**

OR

6   a. Consider the following tables and write the SQL for the following :
       DEPARTMENT (Dnumber , Dname , MgrSSN, MgrStartDate)
       PROJECT (Pnumber , Pname , Plocation , Dnumber)
       EMPLOYEE (SSN , Name , Bdate , Addr , Sex , Salary , SuperSSN , Dno)

WORKS_ON (Essn , Pno , Hours)
DEPENDENT (Essn, Dependent_name , Sex , Bdate, Relationship)
  i)   Retrieve the name and address of all employees who work for the 'Research Department'.
  ii) For each employee, retrieve the employee's first and last name and first and last name of his or her immediate supervisor.
  iii) Retrieve list of employees and the projects they are working on, ordered by department and within each department , ordered alphabetically by last name, first name.
  iv) Retrieve all employees whose address is in Houstan , Texas.
  v)   Find the sum of the salaries of all employees, the maximum salary, the minimum salary and the average salary.   **(10 Marks)**
  b. Discuss database programming issues and techniques.   **(10 Marks)**

Module-4

7 a. Define Functional Dependency and explain informal design guidelines for relation schemas.
                                                                                                            (10 Marks)
   b. What is Normalization? Explain 1NF , 2NF and 3NF with example for each.   **(10 Marks)**

OR

8 a. What is Stored Procedure? Write the syntax for creating stored procedure.   **(10 Marks)**
   b. What is a Trigger? Explain DML trigger, with an example.   **(10 Marks)**

Module-5

9 a. What is Transaction? In what ways it is different from an ordinary program.   **(10 Marks)**
   b. Explain the database recovery technique based on different update.   **(10 Marks)**

OR

10 a. Explain i) ACID properties   ii) Strict two phase locking.   **(10 Marks)**
   b. Discuss deadlock prevention protocols.   **(10 Marks)**

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