Fifth Semester B.E. Degree Examination, Dec.2019/Jan.2020
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. What are the main characteristics of Database Approach? Explain any one. **(06 Marks)**
   b. Explain the component modules of DBMS, with the help of a diagram. **(10 Marks)**
   c. Define the following :
      i) DBMS   ii) Metadata   iii) Logical data Independence
      iv) Physical data Independence. **(04 Marks)**

2 a. What is Recursive Relationship? Explain the significance of role names in recursive relationship with an example. **(06 Marks)**
   b. Design an E – R diagram for a Bank database taking into account at least 5 entities. **(10 Marks)**
   c. Explain Derived Attributes. **(04 Marks)**

3 a. Consider the following database schema :
      SAILORS (Sid , Sname , rating , age)
      BOATS (bid , bname , color)
      RESERVES (sid , bid , day)
      Write queries in relational algebra to
      i)   Find names of sailors who have reserved a red and a green boat.
      ii) Find the names of sailors with age above 25 years who have not reserved a red boat.
      iii) Find name , age of sailors who have reserved boat number '100'. **(09 Marks)**
   b. Discuss entity integrity and referential integrity constraints with suitable examples. **(06 Marks)**
   c. Explain MINUS operation of relational algebra with an example. **(05 Marks)**

4 a. Explain the schema change statement in SQL with examples. **(08 Marks)**
   b. Consider the following database schema :
      EMP (Name , SSn , Salary , Superssn , Dno)
      DEPT (Dnum , Dname , Mgr_SSn)
      WORKS_ON (ESSN , Pno , Hours)
      PROJ (Pname , Pnumer , Dnumber)
      Write SQL queries for the following :
      i)   Retrieve name of an employee having second highest salary.
      ii) For each employee, retrieve employee's name and his or her immediate supervisor name.
      iii) Make a list of all project numbers for projects that involve an employee whose name is 'Raj' either as a worker or as a manager of the department that controls the project.
      iv) Retrieve the total number of employees in 'Research' department. **(12 Marks)**

PART – B

5 a. How are triggers and assertions defined in SQL? Explain with examples. (10 Marks)
   b. What is a Cursor? Explain retrieving multiple tuples with embedded SQL with an example. (10 Marks)

6 a. List the informal design guidelines for relational schema and explain with example update anomalies. (08 Marks)
   b. What is functional dependency? When do we say a set of functional dependencies is minimal? (05 Marks)
   c. What is Normalization? Explain 3NF , with an example. (07 Marks)

7 a. Which normal form is based on the concept of multivalued dependency? Explain it with an example. (10 Marks)
   b. Explain Non – additive (Lossless) join properly of a decomposition. (10 Marks)

8 Write short notes on :
   a. ACID properties.
   b. Two – phase locking protocol.
   c. The lost update problem.
   d. State transition diagram of a transaction. (20 Marks)

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