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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 , Pnum , 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 property 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)
