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10CS54

Fifth Semester B.E. Degree Examination, Jan./Feb. 2023
Database Management Systems

Time: 3 hrs. Max. Marks:100

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

C.M.R. INSTITUTE OF TECHNOLOGY CMR BANGALORE - 37.

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.

PART – A

1 a. Name the main characteristics of a database system and explain each of them briefly. **(10 Marks)**

b. Explain the following :
   i) Types of data independence
   ii) The three schema approach with diagram **(10 Marks)**

2 a. Write a neat diagram for simplified description of the database design process and explain the main phases of database design. **(10 Marks)**

b. Differentiate the following with example
   i) Simple versus composite attribute **(05 Marks)**
   ii) Stored versus derived attribute **(05 Marks)**

3 a. Explain briefly the following Relational algebra operations with example.
i) Union ii) Intersection iii) Minus iv) Cartesian product. **(12 Marks)**

b. Write the Queries in Relational algebra by referring the database given below.
Employee (Fname, Minit, Lname, SSn, Bdate, address, sex, salary, Super_SSn, Dno)
Department (Dname, Dnumber, Mgr_SSn, Mgr_Start_date)
Dept_locations (Dnumber , Dlocation)
Works_on (Essn, Pno, Hours)
Project (Pname, Pnumber, Plocation, Dnum)
Dependent(Essn, Dependent_name, Sex, Bdate, Relationship)
   i) Find the names of employees who work on all the projects controlled by department number 5.
   ii) Retrieve the names of employees who have no dependent
   iii) List the names of employees with more than one dependent.
   iv) List the names of managers who have dependent. **(08 Marks)**

4 a. Name the aggregate functions in SQL and explain each with example queries. **(12 Marks)**

b. i) Explain briefly the correlated nested queries with an example.
   ii) Explain aliasing with an example. **(08 Marks)**

PART – B

5 a. i) Define the concept of view in SQL and write an SQL command to create view.
   ii) Explain how to specify queries at runtime using dynamic SQL. **(10 Marks)**

b. Name the commands used to modify the database and explain each with example SQL statements. **(10 Marks)**

6 a. Define : i) Function dependency with example
ii) I and II Normal forms (10 Marks)

b. i) Differentiate 3NF versus BCNF. Which is better among the two and why.
ii) Classify the update anomalies. Explain each one of them. (10 Marks)

7 a. Explain the following :
i) Interleaved processing and parallel processing
ii) 5th Normal form (10 Marks)

b. Write the Inference Rules for Functional and Multivalued Dependencies. (10 Marks)

8 a. i) Define the shared/exclusive (or Read/write) locks. (05 Marks)
ii) Name the desirable properties of transaction and explain each briefly. (05 Marks)

b. i) Explain the two schemes of deadlocks prevention. (05 Marks)
ii) Name the different states of transaction and explain each with the state transition diagram. (05 Marks)

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