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10CS54

Fifth Semester B.E. Degree Examination, Aug./Sept.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. Explain the component modulus of DBMS and their interaction , with the help of a diagram. **(10 Marks)**

b. Briefly discuss the advantages of DBMS over flat file systems. **(10 Marks)**

2 a. With respect to ER model, explain with examples :
i) Cardinality Ratio ii) Participation constraints. **(04 Marks)**

b. Define an Attribute. Explain different types of attributes that occur in an ER diagram. **(08 Marks)**

c. Design an ER diagram for keeping track of information about a hospital database taking into account atleast entities. **(08 Marks)**

3 a. Consider the following schema :
SAILORS (Sid, Sname, rating , age)
BOATS (bid , bname , color)
RESERVES (Sid, bid , day)
Specify the following queries in relational algebra.
i) Find the name of sailors who reserved green boat.
ii) Find the colour of the boat reserve by "Naresh".
iii) Find the name of the sailor who has reserved boat 1.
iv) Find the sid of sailors with age over 20 who have not reserved a red boat. **(08 Marks)**

b. Explain the need of primary and foreign keys, with suitable examples. **(04 Marks)**

c. Briefly discuss the different types of update operations on relational database. Show an example of violation of the referential integrity in each of the update operation. **(08 Marks)**

4 a. Explain the following : i) SELECT statement ii) ALTER command
iii) Aggregate functions in SQL. **(08 Marks)**

b. Given the schema :
EMP (fname , ℓname , Ssn , bdate , address , sex , salary , superssn, dno)
DEPT (dname, dnumber, mgrssn, mgrstartdate)
DEPT_LOC (dnumber, dloc)
PROJECT (Pname, Pnumber , Ploc, dnum)
WORKS_ON (essn, pno, hours)
DEPENDENT (essn, dependent_name, sex)
Write the SQL queries for the following :
i) List female employees from dno = 20 earning more than 50000.
ii) Find the name of employees who work on all projects controlled by department 5.
iii) Retrieve the names of such employees who are supervised by some other employer.
iv) List the name of all employees with atleast two dependents.
v) Select the name of employees whose 1st letter is R and 3rd letter is M.
vi) Retrieve the department name and average.
Salary of such departments which have an average salary of such department which have an average salary more than 50000. Print the names of such departments in ascending order. **(12 Marks)**

PART - B

5 a. How are triggers and assertions defined in SQL? Explain with examples. **(08 Marks)**

b. Explain the following with examples :

i) DROP command ii) Dynamic SQL iii) Embedded SQL. **(12 Marks)**

6 a. What is Functional dependency? Write an algorithm to find a minimal cover for a set of function dependencies. **(10 Marks)**

b. What is the need of normalization? Explain first and second normal forms with examples. **(10 Marks)**

7 a. Explain Multivalued dependency and fourth normal form with an example. **(10 Marks)**

b. Explain : i) Inclusion dependencies ii) Template dependencies. **(10 Marks)**

8 a. Discuss the ACID properties of a database transaction. **(04 Marks)**

b. Describe the three phases of the ARIES recovery model. **(08 Marks)**

c. Briefly discuss the two phase locking protocol used in concurrency control. **(08 Marks)**

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