17CS53

Fifth Semester B.E. 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. Compare DBMS and early file systems , bringing out the major advantages of the database approach.   **(06 Marks)**
    b. With a neat block diagram, explain the architecture of a typical DBMS.   **(10 Marks)**
    c. What are the responsibilities of the DBA and the database designers?   **(04 Marks)**

OR

2   a. Define the following terms :
        i) Data model   ii) Schema   iii) Instance   iv) Canned Transaction.   **(08 Marks)**
    b. Draw an ER diagram to represent the Election Information System based on the following description :
        In the Indian national election, a state is divided into a number of constituencies depending upon the population of the state. Several candidates contest elections in each constituency. Candidates may be from some party or independent. The election information system must record the number of votes obtained by each candidate. The system also maintains the voter list and a voter normally belongs to a particular constituency.
        Note that the party details must also be taken care in the design.   **(12 Marks)**

Module-2

3   a. Define the following terms :   i) Key   ii) Super key   iii) Candidate key
        iv) Primary key   v) Foreign key.   **(05 Marks)**
    b. Enumerate the steps involved in converting the ER constructs to corresponding relational tables.   **(07 Marks)**
    c. Considering the schema
        Sailors (sid , sname , rating , age)
        Boats (bid , bname , color)
        Reserves (sid , bid , day)
        Write relational algebraic queries for the following :
        i)   Find names of sailors who have reserved boat # 103.
        ii)   Find names of sailors who have reserved a red boat.
        iii) Find names of sailors who have reserved a red or green boat.
        iv)   Find names of sailors who have reserved all boats.   **(08 Marks)**

OR

4   a. Explain with examples , the basic constraints that can be specified when a database table is created in SQL.   **(12 Marks)**
    b. Write SQL queries for the following relational schema :
        CUSTOMER (CID , CNAME , EMAIL , ADDR , PHONE)
        ITEM (ITEM_NO , ITEM_NAME , PRICE , BRAND)
        SALES (CID , ITEM_NO , # ITEMS , AMOUNT , SALE_DATE)
        SUPPLIER (SID , SNAME , SPHONE , SADDR)
        SUPPLY (SID , ITEM_NO , SUPPLY_DATE , QTY)

    i)   List the items purchased by customer 'Prasanth'.

    ii) Retrieve items supplied by all suppliers starting from 1st Jan 2019 to 30th Jan 2019.

    iii) Get the details of customers whose total purchase of items worth more than 5000 rupees.

    iv) List total sales amount, total items , average sale amount of all items.

    v) Display customers who have not purchased any items.   **(08 Marks)**

Module-3

5 a. What are assertions and triggers in SQL? Write a SQL program to create an assertion to specify the constraint that the salary of an employee must not be greater than the salary of the department. The employee works for in the COMPANY database.   **(07 Marks)**

    b. Write a trigger in SQL to call a stored procedure INFORM_SUPERVISOR( ) whenever a new record is inserted or updated, check whether an employee's salary is greater than the salary of his or her direct supervisor in the COMPANY database.   **(07 Marks)**

    c. How do you create a view in SQL? Give examples. Can you update a view table? If yes, how? If not, why not? Discuss.   **(06 Marks)**

OR

6 a. With real world examples, explain the following : i) JDBC   ii) Correlated queries iii) Stored Procedure iv) Schema change statements in SQL.   **(12 Marks)**

    b. Write a complete high level language program (in Java or C) to display the rows of a customer table created in oracle having < custid , custname , balance > columns with embedded SQL.   **(08 Marks)**

Module-4

7 a. What are the problems caused by insertion , updation and deletion anomalies? Discuss with an example.   **(06 Marks)**

    b. For the below given relation R (A, B, C, D, E) and its instance , check whether the FDs given hold or not. Give reasons.

    i) $A \rightarrow B$ ii) $B \rightarrow C$ iii) $D \rightarrow E$ iv) $CD \rightarrow E$.   **(04 Marks)**

A	B	C	D	E
a_1	b_1	c_1	d_1	e_1
a_1	b_2	c_1	d_1	e_1
a_2	b_2	c_1	d_2	e_3
a_2	b_3	c_3	d_2	e_2

    c. Using the minimal cover algorithm , find the minimal cover for the following FDs : $F = \{AB \rightarrow C , A \rightarrow D , BD \rightarrow C , D \rightarrow BG , AE \rightarrow F \}$.   **(10 Marks)**

OR

8 a. Normalize the below relation upto 3NF :

Module	Dept	Lecturer	Text
M1	D1	L1	T1
M1	D1	L1	T2
M2	D1	L1	T1
M2	D1	L1	T3
M3	D1	L2	T4
M4	D2	L3	T1
M4	D2	L3	T5
M5	D2	L4	T6

    (10 Marks)

b. Define Multi valued Dependency and Join Dependency. Explain 4NF and 5NF with examples. **(10 Marks)**

Module-5

9 a. Describe the database inconsistency problems : Lost update , dirty read and blind write.

(06 Marks)

b. With a neat diagram, explain the various states of a transaction execution. **(07 Marks)**

c. Check whether the below schedule is conflict serializable or not.

{b2 , r2(X) , b1 , r1(X) , w1(X) , r1(Y) , w1(Y) , w2(X) , e1, c1, e2, c2}. **(07 Marks)**

OR

10 a. What is 2PL? Explain with an example. **(06 Marks)**

b. How do you detect a deadlock during concurrent transaction execution? **(06 Marks)**

c. Explain the various database recovery techniques, with examples. **(08 Marks)**