53 (IT 402) DBMS

2017

DATABASE MANAGEMENT SYSTEMS

Paper : IT 402

Full Marks : 100

Time : Three hours

The figures in the margin indicate full marks for the questions.

*Answer **any five** questions.*

1. Answer in short : 2×10=20

   (a) What is the difference between the primary key and foreign key ?

   (b) What is the role of database administrator ?

   (c) Give examples of Many-to-one and One-to-one relationship.

   (d) What is the need of normalization ?

   (e) What is identifying relationship ?

   (f) Define trivial functional dependency.

(g) Why concurrency control is needed ?

(h) Explain *any two* aggregate functions of SQL.

(i) What is redundancy ?

(j) Define Database Management System.

2. (a) What is functional dependency ? Explain its types in detail.

(b) What is normalization ? Explain 2NF and 3NF in detail.

(c) Define transaction. Explain the transaction properties and transaction states.

(d) Explain selection and projection operations with examples.

5×4=20

3. (a) Consider the following schema and write SQL for given statements :

STUDENT (Rollno, Name, Age, City)

STUDENT-MARKS (Rollno, Sub1, Sub2, Sub3, Total, Average)

(i) Calculate and store total and average marks from Sub1, Sub2 and Sub3 marks.

(ii) Display name of students who got more than 60 marks in Sub1.

(iii) Display name of students with their total and average marks.

(iv) Display name of students who got equal marks in Sub2.

(v) Count the number of students who got more than 260 as their total marks. 10

(b) Consider the following schema and represent given statements in relational algebra form.

BRANCH (Branch_name, Branch_city)

Account (Branch_name, Ac_no, Balance)

Depositor (Customer_name, Ac_no)

(i) Find out list of customers who have account at 'Kokrajhar' branch.

(ii) Find out all customers who have account in 'Guwahati' city and balance is greater than 20,000.

(iii) Find out list of all branch name with their maximum balance.

(iv) Find out list of customers with their account number.

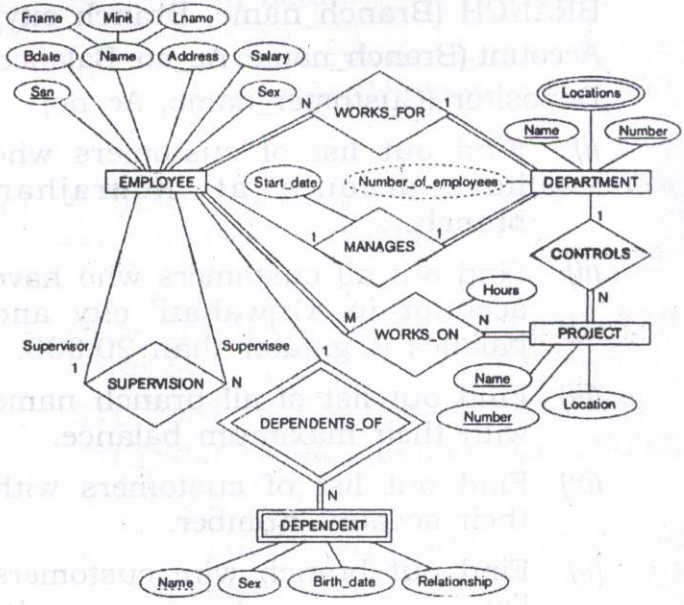
(v) Find out branch wire customers list. 10

4. (a) Explain various types of join operations with suitable examples. 10

(b) Consider table $R(A, B, C, D, E)$ with FDs as $A \rightarrow B$, $BC \rightarrow E$ and $ED \rightarrow A$. The table is in which normal form ? Justify your answer. 5

(c) Explain Two phase locking protocol. What are its advantages and disadvantages. 5

5. (a) Consider the following ER diagram :



Map the above ER schema into a set of relations. 15

(b) Write query for the following : 5

(i) To create a table from a table

(ii) To add a new column in the table

(iii) To add a foreign key in the table

(iv) To sort data in a table

(v) To change the name of a table.

6. Write short notes on : ***(any four)*** 5×4=20

(a) Data Independence

(b) Referential integrity

(c) Boyce-Codd normal form

(d) Database languages

(e) Query Optimization.