DHARMSINH DESAI UNIVERSITY, NADIAD
FACULTY OF TECHNOLOGY
FIRST SESSIONAL
SUBJECT: (CE317) DATABASE MANAGEMENT SYSTEM

Examination	: B.Tech Semester - III	Seat No.	: 31
Date	: 01/08/2023	Day	: Tuesday
Time	: 11:00 a.m.to 12:15 p.m.	Max. Marks	: 36

INSTRUCTIONS:
1. Figures to the right indicate maximum marks for that question.
2. The symbols used carry their usual meanings.
3. Assume suitable data, if required & mention them clearly.
4. Draw neat sketches wherever necessary.

Q.1 Do as directed. **[12]**

CO1 U (a) Explain the distinctions among the terms primary key, candidate key, and superkey. [2]

CO1 R (b) List four significant differences between a file-processing system and a DBMS. [2]

CO2 E (c) Give an example (E-R diagram) of a common mistake, to use a relationship with a single-valued attribute in a situation that requires a multivalued attribute. [2]

CO3 C (d) Suppose we have a database consisting of the following **three relations**: [2]

1. **VISITS(student, parlor)** giving the parlors each student visits.
2. **SERVES(parlor, icecream)** indicating what kind of ice-creams each parlor serves.
3. **LIKES(student, icecream)** indicating what ice-creams each student likes.

(Assume that each student likes at least one ice-cream and frequents at least one parlor)Express the following in **SQL**:
Print the students who visit at least one parlor that serves some ice-cream that they like.

CO3 E (e) Consider the Loan_Records table as given below. What is the output of the following SQL query? [2]

Borrower	Bank_Manager	Loan_Amount
Ramesh	Sunderajan	10000.00
Suresh	Ramgopal	5000.00
Mahesh	Sunderajan	7000.00

```
SELECT Count(*)
FROM ( (SELECT Borrower, Bank_Manager
        FROM Loan_Records) AS S
       NATURAL JOIN (SELECT Bank_Manager, Loan_Amount
                     FROM Loan_Records) AS T );
```

CO1 R (f) Differentiate **WHERE** Clause and **HAVING** Clause. [2]

Q.2 Attempt *Any TWO* from the following questions. **[12]**

CO2 U (a)
1. What is meant by a recursive relationship type? Give two examples of recursive relationship types. [3]
2. When is the concept of a weak entity used in data modeling? Define the terms owner entity type, weak entity type, identifying relationship type, and partial/ discriminator key. [3]

CO2 C (b) Design a database for an automobile company to provide to its dealers to assist them in maintaining customer records and dealer inventory and to assist sales staff in ordering cars. [6]
Each vehicle is identified by a vehicle identification number (VIN). Each

individual vehicle is a particular model of a particular brand offered by the company. Each model can be offered with a variety of options, but an individual car may have only some (or none) of the available options. The database needs to store information about models, brands, and options, as well as information about individual dealers, customers, and cars.
Your design should include an E-R diagram, a set of relational schemas, and a list of constraints, including primary-key and foreign-key constraints.

CO2 C (c) Design a database for a worldwide package delivery company. The database must be able to keep track of customers who ship items and customers who receive items; some customers may do both. Each package must be identifiable and trackable, so the database must be able to store the location of the package and its history of locations. Locations include trucks, planes, airports, and warehouses. [6]
Your design should include an E-R diagram, a set of relational schemas, and a list of constraints, including primary-key and foreign-key constraints.

Q.3 **Consider the following Common Schema for Q.3 and write SQL queries for the following questions:** [12]

CO3 A Branch(branch_name, branch_city, assets)
Customer(customer_id, customer_name, customer_street, customer_city)
Loan(loan_number, branch_name, amount)
Borrower(customer_id, loan_number)
Account(account_number, branch-name, balance)
Depositor(customer_id, account_number)
Description: Above schema represents the **Banking Database**. Banks can have multiple **branches** across various cities. Assets describe the total money of anything that the bank owns.
The **Account table** is used to maintain account details, while the **Loan table** is used to maintain loan related information.
Customer, who has an account number, is known as a **Depositor**. One customer may have multiple accounts. This is described in the Depositor Table.
Customer, who has at least one loan, is known as a **Borrower**. One customer may have multiple loans. This is described in the Borrower Table

(a) Delete all account tuples at every branch located in Surat. [1]
(b) Find the customer names who have an account but no loan at the bank. [1]
(c) Find the average balance for each customer who lives in Bhavnagar and has at least three accounts. [2]
(d) Find the names of all branches that have assets greater than at least one branch located in Ahmedabad. [2]
(e) Find the details of the customer(s) with the 4th highest balance. [3]
(f) For each branch that has more than 200 customers retrieve the branch name and the number of customers who are having a balance more than 50000. [3]

OR

Q.3 **Write SQL queries for the following questions:** **[12]**

CO3 A (g) Delete all loan tuples at every branch located in Surat. [1]
(h) Find the customer names who have a loan but not an account at the bank. [1]
(i) Find the average loan amount for each customer who lives in Bhavnagar and sort it in descending order of average loan amount. [2]
(j) Find the names of all branches that have assets less than at least one branch located in Ahmedabad. [2]
(k) Find the details of the customer(s) with the 4th highest loan. [3]
(l) For each branch that has more than 200 customers retrieve the branch name and the number of customers who are having loans with amounts more than 500,000. [3]