Assignment-5

Q.1 Answer the any seven

1 How to reduce data redundancy?
→ DBMS follows the rules of normalization,
which splits a relation when any of its
attributes is having redundancy in values.
Normalization is a mathematically rich and
scientific process that reduces data
redundancy.

2 Difference ALTER between drop and delete.

→ The drop command is used to remove
table definition and its contents.

→ The delete command is used to delete
specified rows.

3 Differentiate ALTER and update.

→ ALTER Rename the structure of database
table. update statement modifies records
into the existing table.

4 Define : DBMS

→ DBMS (Database management system) refer to the technology solution used to optimize and manage the storage and retrieval of data form from database DBMS offers a systematic approach to manage database via an interface for users as well as work loads accessing the database via application.

5 Explain ORDER BY clause with example.

→ The SQL ORDER BY clause is used to the sort data in ascending or descending order.

→ example:

To Arrange Name of student in Ascending order;

SELECT * FROM STUD ORDER BY NAME ASC;

6 Define strong and weak entity set.

→ The basic difference between strong entity and a weak entity is that the strong entity has a Primary key where as, a weak entity has the Partial key which acts as a discriminator between the entities of a weak entity.

7 Define Primary key with example!

→ The Primary key constraint uniquely identifies each record in data base table. Primary keys must contain unique values, and cannot contain NULL values.

→ example:

Primary key at column Level

CREAT TABLE customer CID, Numeric, Primary key)

8 What is data dictionary?

→ A Data Dictionary is a collection of names, definitions, and attributes about data

elements that are being used or captured in a database. information system or part of a research Project. A what Dictionary also provides meatadata about data elements.

QUE÷ 2

A. Explain File Processing System. Define drawbacks of file Processing system over DBms:-

→ file Processing system is a way of storing retareving and manipulating data in Files Processing system if one need to insert, delete modify storage or update data one must know the end hierarchy of files.

→ Drawbacks of conventional file Processing system÷

1. Data redundancy and inconsistancy.
2. Difficulty in a cressing data
3. Data isalation.
4. Interuty problems.
5. Atomifically Problems
6. con-current across anomalies
7 security problem.

B → e.g -1

car model	maf-year	colour
Hro 1	2018	white white
Hro 2	2018	black
Hro 3	2019	red

Here manf_year and column are independent of each other but both are dependent on can model.

car model → maf_year
car model → colour

2 Trivial functional depedency :-
                              The trivial
dependency is a set of attributes which
are called a travail if the set of
attributes are indctided in that attributes

→ e.g

        emp id

→ e.g -2

emp_id	emp_name
A5555	Raj
A5881	Dhaval
A5818	kishan

Here {emp_id, emp_name} → emp_id is a trivial functional dependency as emp_id is a subset of {emp_id, emp_name}

3 Non-trivial functional dependency:

This dependency occours when A→B, where B is not the subset of A

→ e.g ·3

company	CEO	Age
Apple	tim	57
Google	sundar	46
microsoft	satya	57

Here {company} → {CEO}, but CEO is not a subset of company.

4 Transitive Dependency:

This dependency is indirectly formed by two functional dependency

→ e.g:4

Company	CEO	Age
microsof	Satya	51
Google	Sundar	46
Aibaba	Jack	54

Here, {company} → {CEO}

{CEO} → {age}

∴ {company} → {age}

B what is functinal Dependency? explain types of functional Dependency with example

B 70

→ A functional dependency is a constraint between two set of attributes in a relation from a database In other words, a function dependency is a constraint between two keys.

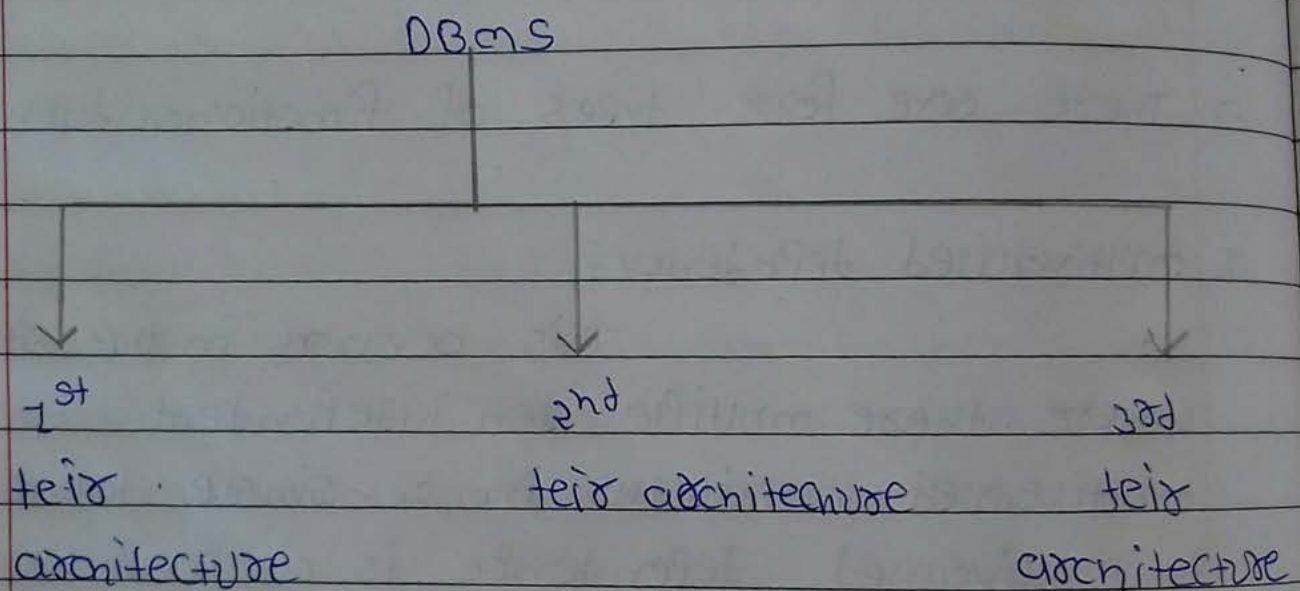→ There are four types of functional dependency.

1 multivalued depedency:

This occurs in the situation where there multiple, iden independent multivalued attributes in a single table A multivalued dependence is a complete constraint between two sets of attributes in a relation ship

C. explain DBms Architecture with figure.

→ The DBms design is based upon it's architex the basic client \ server architex is used to deal with a large number of Pc, we server datables servers and other component that does are connected to with network

→ DBMS architecture depends on how uses are connected to the database to get their request done.

→ There are three types of DBMS architecture

```
                        DBMS
          ┌───────────────┼───────────────┐
          ↓               ↓               ↓
         1st             2nd             3rd
         teir        teir architecture   teir
      architecture                    architecture
```

→ 1st teir architecture:

In this architecture the database is directly available to the uses Any change done here will directly he done on the data base itself.
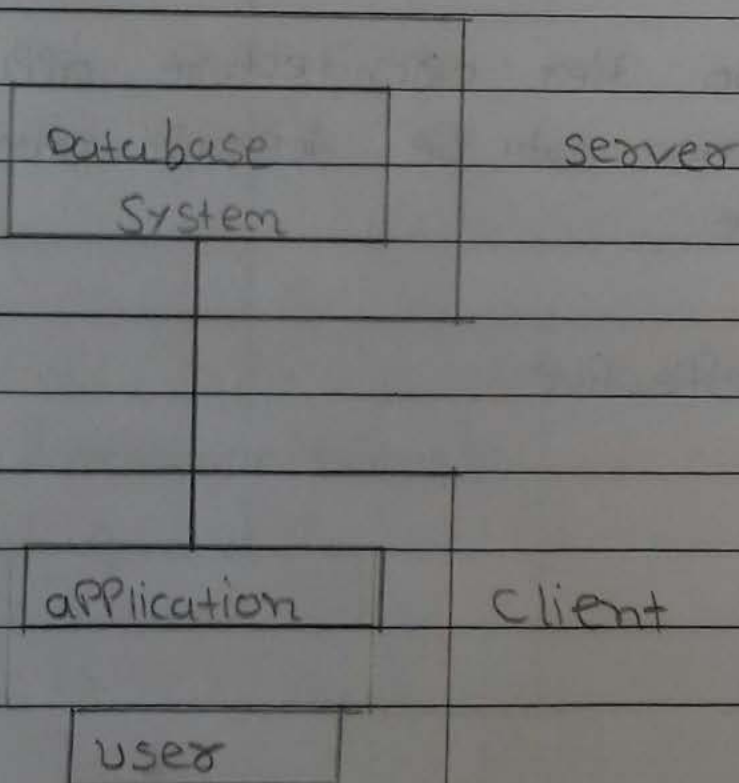
* Advantages:

- easy to implement and optimize
- Don't have compatibility or context switching issue.
- The deployement cost is less.

* Disadvantages:

- Dosen't support remot access for data resources
- Needed high maintenamece.
- The cost of central mainframe is high

2nd teir Architecture.

Database System	Server
application	Client

user

→ In 2nd teir architecture application on the Client end can directly communicated with the database at the sever side for this instruction, API's, like: ODBC, IDBC are used

→ The user interfaces and application programs are run on the Client-side
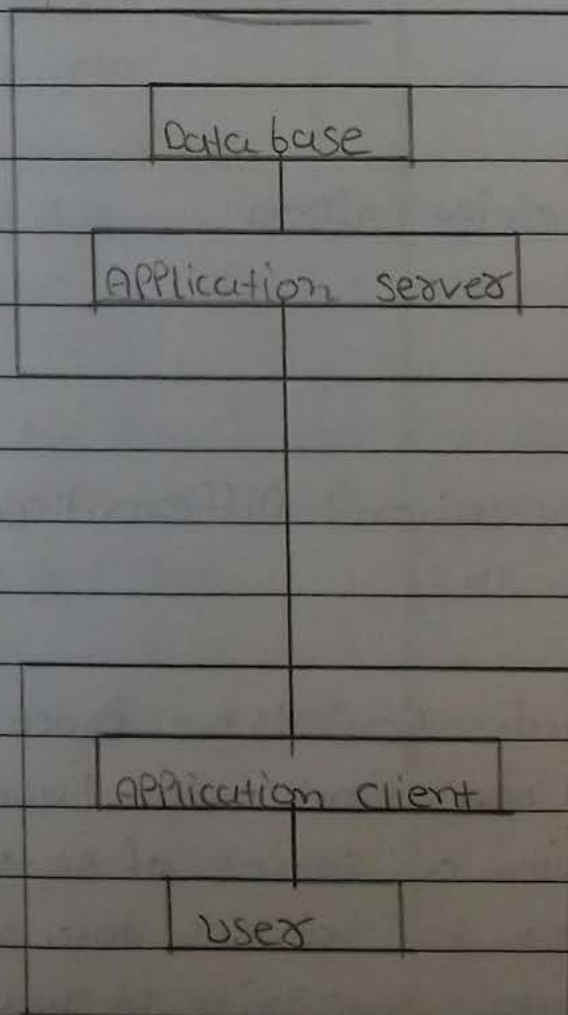
* Advantages:

- easy to maintain and modification is bit easy
- Communication is faster.

* Disadvantages:

- In two tier architecture application Performance will be degrade upon increasing the users.

- Cost ineffective

3rd Tier Architecture :-

→ The 3rd tier architecture contains another layer between the Client and server. In this architecture, client can't directly communicate with the the server.

→ The 3rd tier architecture is used in case of large web application.

```
┌─────────────────────────────┐
│   ┌──────────────┐          │
│   │  Database    │          │
│   └──────┬───────┘          │
│   ┌──────┴───────────┐      │
│   │ Application server│      │
│   └──────────┬───────┘      │
│              │              │
│              │              │
│              │              │
│   ┌──────────┴───────────┐  │
│   │ Application Client   │  │
│   └──────────┬───────────┘  │
│       ┌──────┴──────┐       │
│       │    User     │       │
│       └─────────────┘       │
└─────────────────────────────┘
```

* Advantages:

- High performance, lightweight persistent objects

- Scalability. each tier can scale horizonatally

- Performance. Because the Persentation thier can cache requests, network vization is minimized, and the load is reduced on the application and data tiers.

* disadvantages

- Increase complexity / effort.

Que-3

Q what is Normalization? Differentiate 3NF and BCNF

→ Database normalization is the Process of structuring a realational database in accordance with a series of so-called normal forms in order to reduces data redundancy and improve data integrity. It was

First Proposed edgr F. Codd as part of his relation model.

3NF	BCNF
1 In 3NF there should be no transitive dependency that is non-non Prime attribute should be transistively dependent on the candidate key	I BCNF any relation A→B Should a super key of relation.
2 It is less stronger than BCNF	It is comparatively more stronger them 3NF
3 In 3NF the functional dependencies are already in INF and INF	IN BCNF the functional dependencies are already in INF 2NF and 3NF
4 The redundancy is high in 3NF	The redundancy is comparatively low in BCNF.

5 In 3NF there is preservation of all functional dependencies	In BCNF there many or not be preservation of all functional dependencies.
6 It is comparatively easier to achieve	It is difficult to achieve
7 lossless decomposition can be achieved by 3NF	lossless decomposition is hard to achieve in BCNF

B Differentiate between Relational model Network model and hierarchical model with appropriate figures.

1 Relational data model:-

→ Data and relationships are represented by a collection of tables. each table has a number of columns with unique

→ Example : Customer, Account.

→ main reason to introducing this mode was to increase the Productivity of the application Program when a change is made to the database users need not know the exact Physical structure to use the database.

* Advantages:

- Structure Independence:
                              any changes to the database structure

* example:
        Age is added to employee table but it does not change the relation between these two table

- Ease of design:
                To implement relation of model Program need not be aware how table are stored internally.

* Simplicity in access:-

Because data are stored in table format.

* Disadvantages

- High hardware and software overhead:-

Relational model fress database designer, Programer and end users from their tedious efforts required to stored, retrieve and design relationship between data.

2 Network data model:-

→ Data are represented by collection of records. relationship among data we represented by links. This links can be viewed as a pointer The network data model represents data for an entity set by logical record type.

→ Network data model conceived as flexible way of representing objects and their relationship.

→ Advantages:

- conceptually simple:

This model is conecptually very easy to design.

- Handle complex relationship:

many too many relationship can been implemented without any repetition.

→ Disadvantages

- Complexity:

In network data model data are stored using pointer. In this model to design a graph many pointer are required. Thus the entire database becomes very complex.

3 Hierarchical data model:

→ The hierarchical data model organizes data in a tree structure.

→ There is a hierarchical of parent and child data segments. This structure implies that a record can have repeatting information, generally

in the child data segments.

→ Hierachical model is similar to network model Hierarchical model represented by collection of record and relationship are represented by links.

→ A link is an association between Precisely to record. In this model records. we are organize in the form of rooted tree when the root of a tree is a dummy.

C. Define Attributes and types of attributes in details.

→ Attributes:

An entity is represented by a set of attributes. Attributes are a descriptive properties of an entity. each entity many have its own attributes.

→ types of attributes:

1. simple and composit attributes
2. single value and multi-value
3. Derived attribute
4. key attribute
5. Null attribute.

1 Simple and composite attributes:-

→ an attributes which are not divided into sub
parts known as simple attributes.

→ composite attributes on other hand can be divide
into sub parts.

2 single value and multi-valued attributes:-

→ single value attributes have a single value
for a particular entity.

→ example:- Loan number.

→ where as multi value attributes have multiple
value for a particular entity

→ example :- Phone number

3 Derived attribute:-

value of this type of attribute is
derived from the value of other related attribute
or entities. suppose that is the customer entity set
has attribute Age that indicates customer Age.
If the customer entity set also has an
attributed datae of birth. we can calculate age
from the DOB. Thus Age is a derived attribute

4 key attribute:

> key attributes are those attributes which can identify an entity uniquely in an entity set.

5 Null attribute:

> An attribute is used when entity does not have the values for an attribute that can accepted null value Here null means entire information is missing or unknown.

QUE:4

A Explain any from Aggregate functions with example

1 AVG();-

> The AVG Aggregate function will return any an average of the values. This also is generally done on numbers.

→ Syntax:

> Select avg (field) AS column_name From table_name;

→ example:-
        select avg (marks) As Total_marks
    from STUDENTS;

2 sum ():-
        To calculate totals.

→ Syntax:-
        select Sum (field) As column_name
    From table_name;

→ example:-
        select Sum(MARKS) As total_marks
    From STUDENTS;

3 First ():-
        This function returns the first value
    of the column which you choose.

→ Syntax:-
        select FIRST (column_name)
        FROM Table_name;

4 Last( );-

    used to return the last value of the column which you choose.

→ Syntax

    SELECT LAST (column_name)
    FROM table_name;

→ Example :

    SELECT Last (marks)
    FROM Students;

B explain DDL and DML Command

→ DDL (Data Definition language)

→ DDL is used to define the database structure or table. DDL is also used to specify additional Properties of the data.

→ The storage structure and access methods used by database system by a set of statement in a special type of DDL called data storage and definition language.

→ These statements define the implementation details of the database schema, which we usally hidden from the users, The data values stored in the database must satisfy certain consistency constraints.

→ For example suppose the university requiredes that the account blance of a department must never be negative The DDL provides fucilities. to specify such contraints. The database system checks there contuints every time thatte database is updated.

2. ❷ DmL (Data manipulation Language):

→ DmL statements are used for managing data within schema objects.

→ DmL are of two types:
   1). Prodcedural ❸DmLS
   2) Declerative DmLS

1 Procedural DmLS:
   require a user to specify that data are needed and how get those data.

2 Declerative DMLS:
                   require a user to specify what data are needed without specifying how to get those data.

→ Declarative DMLS are usually easier to learn and use than Procedural DMLS. However, since a user does not have to specify how to get the data, the database system has to figure out an effient means of accessing data.

C explain data independence ion details.

→ The ability to modify schema definition in one level without affecting a schema defination in the next higher level is called data independence.

→ There are two levels of data independence:

1- Physical data

2 logical data.

1 Physical data Independence:

Physical data independence is the ability to modify the Physical schema without affecting logical schema. Schema modification at the Physical level is occasionally necessary to improve Performance.

# 2 logical data Independence:

logical data independence is the ability to modify the logical schema without affecting Physical schema. modifications at the logical levels are necessary whenever the logical structure of the database is altered. logical data independence is more difficult to achieve than the Physical data independence, since application Programs are heavily dependent on the logical structure of the data then very access.
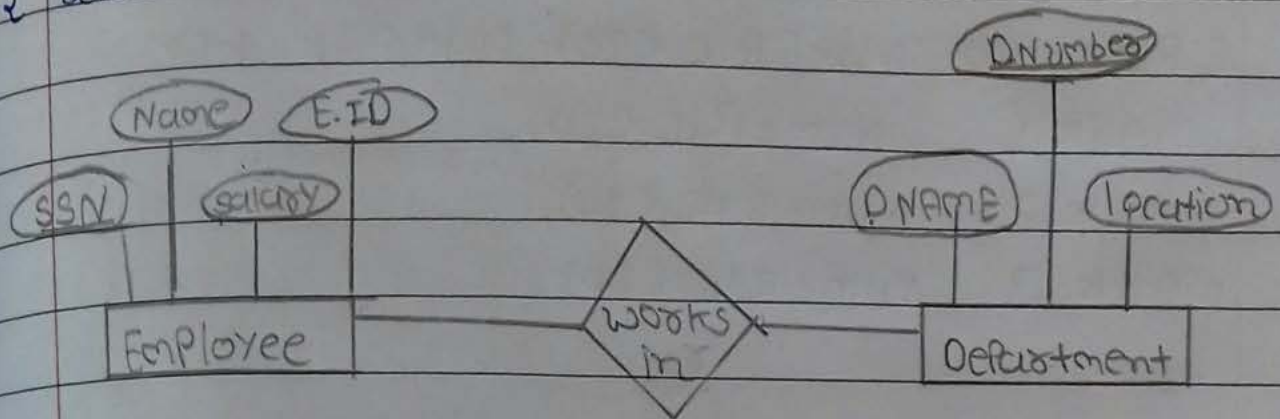
Que-5

A Draw ER diagram of any one!

1 online banking management
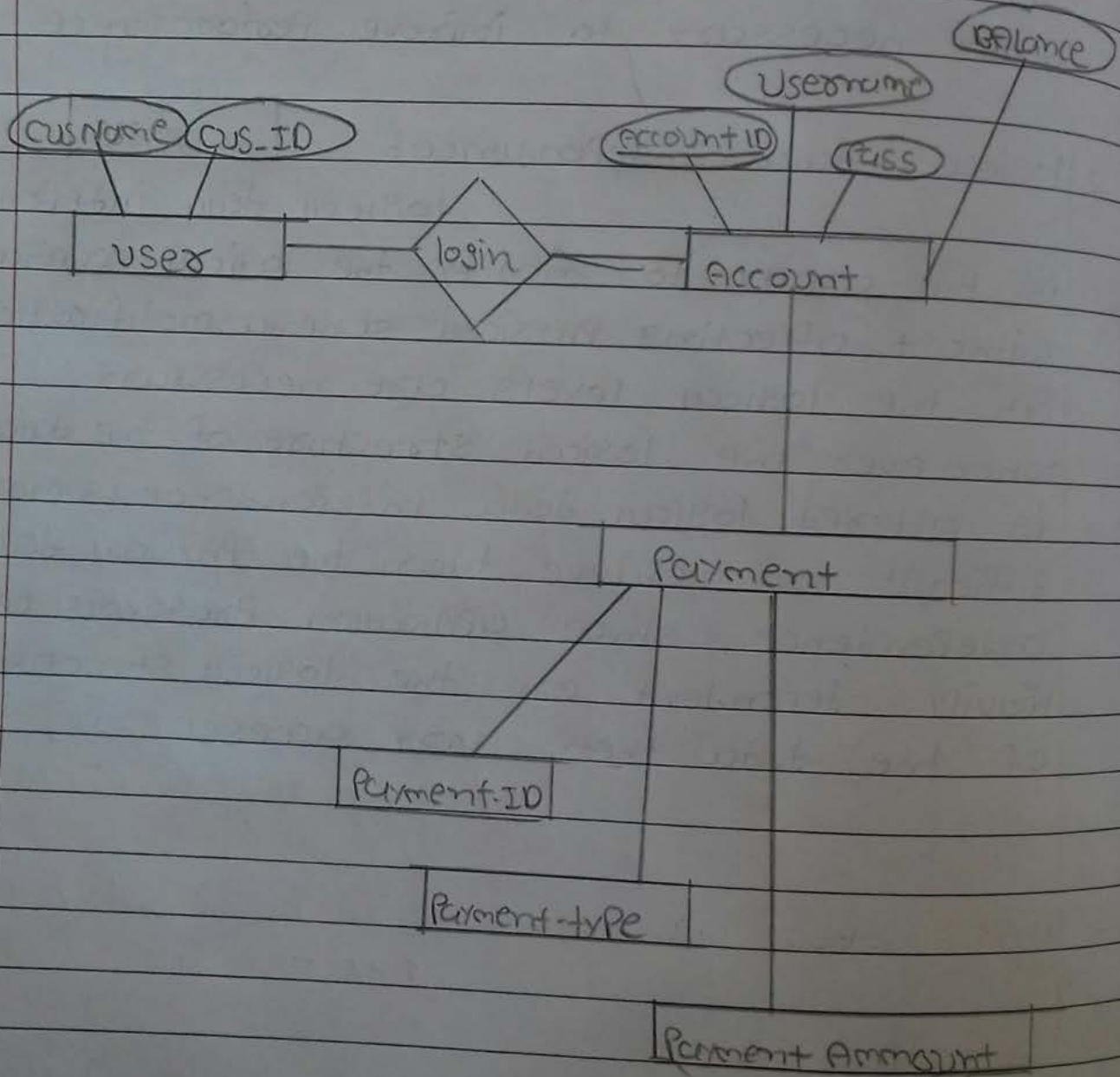
online banking management.

2 Department Store:

Department Store

B write any four SQL considering following relationship

STUDENT (ROLLNO, NAME, CITY, PINCODE)
RESULT (ROLLNO, MARK1, MARK2, MARK3)

→ Queries:

1 write SQL to create tables for above relationship with appropriate constraints.

→ CREAT TABLE STUDENT
(ROLLNO NUMERIC (10) PRIMARY KEY,
NAME VARCHAR (20),
CITY VARCHAR (20),
PINCODE NUMERIC (10)
);

→ CREATE TABLE RESULT
(ROLL-NO NUMERIC (10) PRIMARY KEY,
  MARK 1   NUMERIC (10),
  MARK 2   NUMERIC (10),
  MARK 3   NUMERIC (10)
  );

2 list name and total marks of all the
   students who are studing in class FYBCA.
   → SELECT S NAME, R. TOTAl MARKS
   FROM STUDENT AS S,
   RESULT AS R.
   WHERE STREEM= 'FYBCA';

3 Display city wise total number of
   students.

   → SELECT COUNT (CITY AS CITY STUDENTS
   FROM STUDENT;

4 list the name of students who scored more than
   60% in mark2.

   → SELECT NAME FROM STUDENT
   WHERE R.MARK2 > 60 ;

5 list name of student whose name
start with 'v'.

→ SELECT NAME FROM STUDENT
WHERE NAME LIKE 'V*';