XII – IP –MySQL - CONCEPT

Topic 1 – Database Concepts

Revision of database concepts and SQL commands covered in class XI

(**Class XI Syllabus:** Database concepts and the Structured Query Language.

Database Concepts: Introduction to database concepts and its need, Database Management System.

Relational data model: Concept of domain, tuple, relation, candidate key, primary key, alternate key

Advantages of using Structured Query Language, Data Definition Language, Data Query Language and Data Manipulation Language, Introduction to MySQL, creating a database using MySQL, Data Types

DATABASE : A collection of interrelated data stored together to serve multiple applications. It is a computer based record keeping system.

DBMS: A DBMS refers to database management system.

It is a software that is responsible for storing, manipulating, maintaining and utilizing database.

A database along with a DBMS is referred to as a database management system.

Examples of DBMS Software: MySQL, MS Access, Oracle, MS SQL Server, Sybase, PostgreSQL, SQLite.

Limitations of the File-based Approach:

1. Data Redundancy
2. Data Inconsistency
3. Data Sharing Security/Control Issues
4. Difficulty in Access
5. Data Isolation
6. Data Dependence

Purpose/Uses of DBMS:

1. Databases reduces Redundancy.
2. Database controls inconsistency.
3. Database facilitate sharing of data.
4. Database ensures security.
5. Database maintains Integrity
6. Database enforces standards.

Data Redundancy refers to the storage of the same data multiple times (i.e., duplicated data).

Data Inconsistency : Multiple mismatched copies of same data is called data inconsistency.

Data Isolation refers to a situation where data of one file cannot be mapped to other related file in the absence of links or mappings or common formats.

Data dependence : The close relationship between data stored in files and the software programs that update and maintain those files is called data dependence.

Database Schema: It is a sketch/skeleton/blueprint of tables, columns, relations, constraints and relationships that make up a logically distinct section of a database.

Database Instance: It is a snapshot of a database that exists at a particular time, i.e., the data which is stored in the database at a particular moment of time.

Data Dictionary is a file storing **metadata** (data about data) of the objects of a database.

Database Constraint: A database constraint is a set of rules that define valid data.

Query is a type of command that retrieves data from a database stored on a server. A database query is usually written in SQL (Structured Query Language)

Database Engine: It is the underlying software component that a DBMS uses to create, read, update and delete data from a database.

RELATIONAL DATABASE MODEL

Relational Model was developed by **E.F.Codd** of the IBM and used widely in the most of the DBMS.

Relation (Table): A Relation or Table is matrix like structure arranged in rows and columns.

It has the following properties:

- In relational database model data is organized into tables (collection of rows and columns).
  These tables are also known as **relations**.
- All items in a column are homogeneous ie same data type.
- Each column assigned a unique name and must have atomic (individual) value.
- All rows of a relation are distinct ie no two identical rows (records) are present in the Relation.
- Ordering of rows (records) or columns (fields) are immaterial.
- **Domain:** It is collection of values from which the value is derived for a column.
- **Tuple/Entity/Record:** Rows of a table is called as tuple or record.
  (Collection of data items which represent a complete unit of information.)
- **Attribute/Field :** Column of a table is called attribute or field.
- **Cardinality :** Number of Records(tuples) in a table
- **Degree:** Number of columns (attributes) in a table.

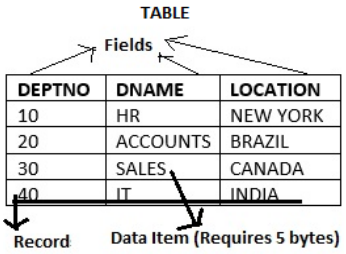
For example, if we want to store details of students then: Roll, Name, Class, Marks etc will be the column/attributes and the collection of all the column information will become a row/record.

Roll	Name	Class	Marks
1	Rajesh	VII	75
2	Pavan	IX	90
3	Sunitha	VIII	80

Table : Student

Here, Degree of the table student = 4 (no.of columns)
Cardinality of the table student = 3 (no.of rows)
Domain of Marks = 0 to 100 (Max.Marks=100)

Data Item: Smallest unit of named data. It represent one type of information and often referred to as a field or column information.



For the above table,
Cardinality(No.of tuples) is **4**,
Degree(Number of attributes) is **3**.

KEYS IN A DATABASE

Primary Key: A primary key is a set of one or more attributes that can uniquely identify tuples within the relation.

Candidate Key: All attribute combinations inside a relation that can serve as primary key are Candidate Keys as they are candidates for the primary key position.

Alternate Key: A candidate key that is not the primary key is called an Alternate Key.

Foreign Key: A non-key attribute, whose values are derived from the primary key of some other table, is known as Foreign Key in its current table.

Ex:
Student(Admno, Rno,Name,Address,Aadhaar)
Here, Candidate Keys: Admno, Aadhaar
(Selected) **Primary Key:** Admno
Alternate Key : Aadhaar
Consider Another Table:
Mess (Date, Foodtime,Admno,Price)
In this table Admno is not a primary key but in Student table, it is Primary Key. So Admno in Mess can be a Foreign Key.

MySQL

Runs on virtually all platforms including Linux, Unix and Windows. Popular for web based application and online publishing. It is a part of LAMP (Linux, Apache, MySQL, PHP) stack.

It is Free and Open Source Software.
It is case **insensitive** language.

Key features of MySQL:
Speed, Ease of Use, FOSS, Query Language Support, Portability (can work in many platforms), Different Data Types, Password Security, Can handle large databases, Clients can connect to MySQL Server using several protocols, Several client and utility programs by MySQL, etc.

Processing Capabilities of SQL:
(1) Data Definition Language (DDL): The SQL DDL provides commands for defining relation schemas, deleting relations, creating indexes, and modifying relation schemas.
(2) Interactive Data Manipulation Language (DML): The SQL DML includes a query language which includes also commands to insert, delete, and modify tuples in the database.
(3) Embedded Data Manipulation Language: The embedded form of SQL is designed for use within general purpose programming languages such as Python, C, C++, etc.
(4) Authorization : The SQL DDL includes commands for specifying access rights to relations and views.
(5) Integrity: The SQL provides (limited) forms of integrity checking. Future products and standards of SQL are likely to include enhanced features for integrity checking.
(6)Transaction Control : SQL includes commands for specifying the beginning and ending of transactions along with commands to have a control over transaction processing.

CLASSIFICATION OF SQL STATEMENTS

SQL used to interact with database. All SQL statements are instructions to the database only. And that is where it differs from general purpose programming languages like C or C++ or BASIC, etc.
SQL commands can be divided into following categories.
(i) Data Definition Language (**DDL**)
(ii) Data Manipulation Language (**DML**)
(iii) Transaction Control Language (TCL)
(iv) Session Control Commands
(v) System Control Commands

The Data Definition Language (DDL):
commands allow you to perform tasks related to data definition.

Create, alter, and drop schema objects: Used to create, change or delete objects such as table, view, index, etc.
DDL Commands: CREATE TABLE, ALTER TABLE, DROP TABLE, etc

DML (Data Manipulation Language) : Used to manipulate data. That is, DML commands query and manipulate data in existing schema objects.
Can do:
Retrieval of information stored in the database (**select**), Insertion of new information into the database (**insert into**), Deletion of information from the database (**delete from**), Modification of data stored in the database (**Update**)

Grant and Revoke Privileges and roles: To grant or revoke permissions or privileges to work upon schema objects.
These are also called as **Data Control Language (DCL) commands.**

Maintenance Commands : To analyse information on a table with an aim of maintaining it. **Ex:** ANALYZE TABLE, CHECK TABLE, etc.

DMLs are basically of two types:

(i) Procedural DMLs : Require a user to specify what data is needed and how to get it.
(ii) Non procedural DMLs: Require a user to specify what data is needed without specifying how to get it.
TCL Commands: Transaction is one complete unit of work.
TCL Commands Examples: COMMIT, ROLLBACK, SAVEPOINT, SET TRANSACTION

CBSE QUESTIONS – MCQs

1. With respect to databases, a row in a relation is also known as a/an _____.
(A) Attribute **(B) Tuple**
(C) Field (D) Domain

2. The _____ command can be used to select an existing database in SQL.
A) USE

CBSE QUESTIONS – QUESTIONS

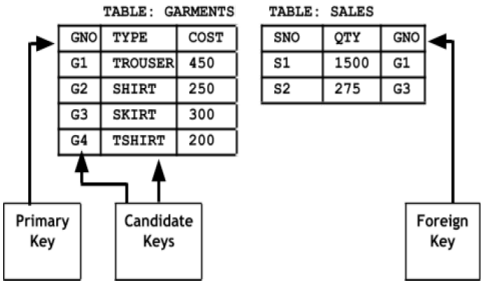
1. Define the term Primary Key in a database. Explain how it is different from a Candidate Key.
A) **Primary Key :** The attribute(column) or set of attributes that can uniquely identify each row in a table (relation).
It must contain unique values and cannot be null.
How it differs from Candidate Key
There can be multiple Candidate Keys in a table (relation), but only one of them is selected as Primary Key.

2. What do you understand by primary key?
A) The attribute(column) or set of attributes(columns) which is used to identify a tuple/ row uniquely is known as Primary Key.
Ex: Table : Student

AdmNo	Name	Marks
1001	Naveen	90
1002	Lakshmi	95

Here Admission Number is primary key as it is identifying a row uniquely.

3. Explain each of the following with illustrations using a table:
1. Candidate Key 2. Primary Key 3. Foreign Key
A) 1. Candidate key : Any attribute which can be used to identify a record in a table.
2. Primary key uniquely identifies a record in the table.
3. Foreign key is an attribute in the table which is the primary key in another table.
For example:



4. Answer the following questions based on the table Sales given below :

Table : **Sales**

id	Name	City	Commission
E001	Naman Batra	Chandigarh	20
E002	Rupesh Mann	Delhi	15
E005	Ravi Gautam	Mumbai	25
E006	Mukul Singh	Delhi	30
E007	Ruby Rai	Mumbai	19
E003	Raman Roy	Kolkata	16

Suggest the Primary key for the given table ?
A) id

5. Answer the following questions based on the table Salesman given below :

Table: **Salesman**

salesman_id	name	city	commission
5001	Neil Bhatt	Delhi	0.15
5002	Rohan Malik	Mumbai	0.13
5005	Ravi Mohan	Delhi	0.11
5006	Mehak Rai	Delhi	0.14
5007	Paul Lal	Bangalore	0.13
5003	Raman Sen	Kolkata	0.12

(i) How many tuples does the given table have ?
A) 6
(ii) Suggest the primary key for the given table.
A) salesman_id

6. Consider the following records in Cars table and answer the given questions:

CarID	Make	Model	Year	Color	Price
101	Toyota	Camry	2022	Blue	25000.00
102	Honda	Civic	2021	Black	22000.00
103	Ford	Mustang	2023	Brown	35000.00
104	Chevrolet	Equinox	2022	White	28000.00
105	BMW	X5	2023	Blue	45000.00
106	Volkswagen	Golf	2021	Black	20000.00

How many tuples are present in the cars table? Also identify the most suitable column of the cars table to mark as primary key column.

Ans. Number of tuples: 6

Primary key column: CarID

7. Observe the following tables TRANSACTIONS and CUSTOMERS carefully and answer the questions that follow:

TABLE: TRANSACTIONS

TNO	TYPE	AMOUNT	CNO
T1	CREDIT	1000	C3
T2	DEBIT	1500	C1

TABLE: CUSTOMERS

CNO	CNAME
C1	ZEESHAN
C2	AMAN
C3	JASPREET

(i) What is the Degree of the table TRANSACTIONS ? What is the cardinality of the table CUSTOMERS ?

(ii) Identify the primary key and candidate keys from the table TRANSACTIONS.

A) i) Degree of the table TRANSACTIONS = 4

Cardinality of the table CUSTOMERS = 3

ii) TNO PRIMARY KEY, CNO CANDIDATE KEYS

8. What is the difference between PRIMARY KEY and UNIQUE constraint applied on Columns of a table? Explain with the help of example.

A)

PRIMARY KEY	UNIQUE
Primary key is used to identify a row (record) in a table.	Unique-key is used to prevent duplicate values in a column.
A table can have only one primary Key.	A table can have multiple unique keys.
Primary key does not accept NULL values.	Unique key may accept only one NULL value.

Example: **Table: Results**

STUDENTID	NAME	EXAMID	EMAILID
10	Leena	1	abc@gmail.com
11	Beena	2	xyz@hotmail.com
12	Samarth	1	
13	Shoaib	1	nml@gmail.com
14	Sheela	2	xyz@yahoo.com

Primary key : STUDENTID

UNIQUE key: EMAILID

9. Consider the following tables SUPPLIER and ITEM and answer the questions that follow:

Table: SUPPLIER

SNo	SName	Area	Email
S01	Quant Computers	East	abc@gmail.com
S02	Superb Media	West	sss@hotmail.com
S03	Media Store	North	
S04	Avon Hardware	North	xyz@gmail.com
S05	AV Tech	South	tmt@hotmail.com

Table : ITEM

INo	IName	Price	SNo
N01	Mother Board	15000	S01
N02	Hard Disk	4000	S01
N03	Keyboard	800	S02
N04	Mouse	300	S01
N05	Mother Board	13000	S02
N06	Key Board	400	S03
N07	Hard Disk	4500	S03

Which column should be set as the Primary key for SUPPLIER table? Mr. Vijay, the Database Manager feels that Email column will not be the right choice for Primary key.

State reason(s) why Email will not be the right choice.

A) Primary key for Supplier table : SNO

Email cannot be set as the primary key as Primary key column cannot be NULL. Many Suppliers may not have emailids.

(OR)

Write the data type and size of INo column of 'ITEM' table.

A) Data Type: Char/Varchar

Size :3

Topic 2 - SQL

Revision of database concepts and SQL commands covered in class XI (Continuation)

Data Definition: CREATE DATABASE, CREATE TABLE, DROP, ALTER

Data Query: SELECT, FROM, WHERE with relational operators, BETWEEN, logical operators, IS NULL, IS NOT NULL

Data Manipulation: INSERT, DELETE,UPDATE)

&

ALTER TABLE

&

Querying and manipulating data using Group by, Having, Order by.

MySQL Elements:

(1) Literals : It is a fixed data value. It may be of character type or numeric literal or of other datatypes.

Ex: 'Bvrm',10,15.5,'marks7', etc.

(2) Datatypes : To identify the type of data and associated operations for handling it.

Important Datatypes:

Datatype	Purpose	Other Information
int	for integers	Ex: 45,-25
float	for real values	Ex: -2.5, 10.32
Char	for characters	Fixed length strings
Varchar	for characters	Variable length strings
Date	for dates	Format: YYYY-MM-DD

The **YEAR** data type is used to store a year in a 4-digit format

Characteristics of the YEAR Data Type

- **Storage:** The YEAR data type only requires 1 byte of storage.
- **Format:** Values for the YEAR type can be displayed in YYYY format.
- **Range:** Valid values for the YEAR data type are 1901 to 2155, and 0000.

Differences between char and varchar:

Char has a fixed size, but varchar has a variable size. Char data type stores data of fixed length, whereas the Varchar data type stores variable format data.

Ex:

Datatype	Entered Data	Actually stores
Char(20)	Kishore	20 characters
Varchar(20)	Kishore	7 characters

(3) Nulls : If a column in a row has no value, then column is said to be null, or to contain a null.

(4) Comments: A comment is a text that is not executed, it is only for documentation purpose. (Begin with /* and end with */, Begin with - - followed by space, Begin with #)

Keywords: Words that have a special meaning in SQL.

Commands or **Statements** are instructions given by you to a SQL database. Commands consist of one or more logically distinct parts called **clauses**. Clauses consists of keywords and arguments. Ex: "FROM Sales", "WHERE marks>75. **Arguments** complete or modify the meaning of a clause. Sales is the argument, and FROM is the keyword of FROM clause. **Objects** are structures in the database that are given names and stored in memory.

DATABASE COMMANDS

(1) Creating a Database:
Syntax: Create Database Databasename;
Ex: Create Database WB;

(2) Opening a Database:
Syntax : Use Databasename;
Ex: Use WB;

(3) Getting list of all databases:
Show Databases;

(4) Removing Database:
Syntax: Drop Database Databasename;
Ex: Drop Database WB;

(1) Create Table : This command is used to create a new table.

Syntax: Create Table Tablename (colname datatype(size), colname2 datatype(size),……..);

Example:

CREATE TABLE STUDENT (Rno int,name varchar(30),class varchar(5),DOB date,marks float);

Constraints (Integrity Constraints)

A constraint is a condition or check applicable on a field or set of fields

Basic Type of Constraints:

(i) Column Constraints:Applicable to one column
(ii) Table Constraints:Applicable to groups

CREATE TABLE SYNTAX WITH CONSTRAINTS:

CREATE TABLE <table name>
(<column name><data type>[(<size>)]
<column constraint>,
<column name><data type>[(<size>)]
<column constraint>,
……
<table constraint>(<column name>,[,<column name>…])…);

Ex:

CREATE TABLE employee
(ecode integer NOT NULL, ename char(20)
NOT NULL, sex char(1) NOT NULL,
grade char(2), gross decimal);

NOT NULL mean the column can never have empty values (i.e.NULL values).
Otherwise SQL will assume that NULLs are permitted.

Different Constraints:

These constraints ensure database integrity, thus are sometimes called database integrity constraints.

Few of them are:

- Unique Constraint
- Primary Key Constraint
- Default Constraint

- Check Constraint
- Foreign Key Constraint

1. Unique Constraint: This constraint ensures that no two rows have the same value in the specified column(s).

2. Primary Key Constraint: This constraint declares a column as the primary key of the table. It is similar to Unique constraint except that the unique
constraint can occur multiple times in a table, but primary key constraint can only be applied just once in a table.

3. Default Constraint: A default value can be specified for a column using the DEFAULT clause. When a user does not enter a value for the column (having default value), automatically the defined default value is inserted in the field.

4. Check Constraint: This constraint limits values that can be inserted into a Column of a table.

Ex:

```
CREATE TABLE employee
( ecode integer NOT NULL PRIMARY KEY,
  ename  char(20) NOT NULL,
  sex char(1)  NOT NULL,
  grade char(2) DEFAULT 'E1',
  gross decimal CHECK (gross>2000) );
```

5. Foreign Key Constraint: Whenever two tables are related by a common column (or set of columns), then the related column(s) in the parent table (or primary table) should be either declared a PRIMARY KEY or UNIQUE KEY and the related column(s) in the child table (or related table) should have FOREIGN KEY constraint.

Ex: Tow Tables…
Items (Itemno, Description, Price, QOH)
Orders (Orderno, Orderdate, Itemno, Qty)

Both the tables are related through common column Itemno. The column Itemno is primary key in parent table Items and it should be declared foreign key in child table Orders to enforce referential integrity i.e., both the tables should be created as follows.

```
CREATE TABLE Items ( Itemno char(5) NOT NULL PRIMARY KEY, ……..);
CREATE TABLE Orders (Orderno float NOT NULL PRIMARY KEY, ……
   Itemno char(5) REFERENCES Items (Itemno)  );
```

Notice that the related columns Itemno in child table Orders has been declared foreign key through REFERENCES clause.

CREATING TABLE from Existing Table:

Sno	Name	Marks
1	Mohan	30
2	Pavan	95
3	Lakshmi	75
4	Sunitha	90

Table : Student

```
CREATE TABLE PASSSTUDENT AS (SELECT NAME,MARKS FROM Student WHERE Marks>=40);
```

Sno	Name	Marks
2	Pavan	95
3	Lakshmi	75
4	Sunitha	90

Table: PASSSTUDENT

(2) Viewing a Table Structure:

This command is used to describe the structure of the table.

Syntax: DESC/DESCRIBE <table name>;

Ex: DESC STUDENT;

```
mysql> DESC STUDENT;
+-------+-------------+------+-----+---------+-------+
| Field | Type        | Null | Key | Default | Extra |
+-------+-------------+------+-----+---------+-------+
| Rno   | int(11)     | YES  |     | NULL    |       |
| name  | varchar(30) | YES  |     | NULL    |       |
| class | varchar(5)  | YES  |     | NULL    |       |
| DOB   | date        | YES  |     | NULL    |       |
| marks | float       | YES  |     | NULL    |       |
+-------+-------------+------+-----+---------+-------+
```

(3) SHOW TABLES: This commands is used to show the table names in current database.

Ex: SHOW TABLES;

```
mysql> SHOW TABLES;
+----------------+
| Tables_in_test |
+----------------+
| employee       |
| student        |
+----------------+
```

(4) INSERTING VALUES INTO TABLES:

Syntax: insert into table name values (value1,value2, value3, ….);

Ex:

```
insert into student
values(1,'Nani',6,'2011-03-15',75);
    insert into student
values(2,'Mohan',6,'2011-11-23',90),
(3,'Lakshmi',6,'2010-10-28',90);
    insert into student
values(4,'Sunitha',7,'2009-12-15',82),
(5,'Naveen',7,'2010-03-20',70);
```

Note: While entering data quotes should be given for char, varchar & date datatypes.

Inserting Data From Another Table:

Sno	Name	Marks
1	Mohan	30
2	Pavan	95
3	Lakshmi	75
4	Sunitha	90

Table : **Student**

INSERT INTO FAILSTUDENT SELECT NAME,MARKS FROM Student WHERE Marks<40;

Sno	Name	Marks
1	Mohan	30

Table : **FAILSTUDENT**

(5) SELECT Command: Is used to display the results.

Selecting Particular Columns:

Syntax: Select Att1,Att2,….. (or * to select all data) from tablename;

Ex:

```
mysql> SELECT NAME,MARKS,DOB FROM STUDENT;
+---------+-------+------------+
| NAME    | MARKS | DOB        |
+---------+-------+------------+
| Nani    |    75 | 2011-03-15 |
| Mohan   |    90 | 2011-11-23 |
| Lakshmi |    90 | 2010-10-28 |
| Sunitha |    82 | 2009-12-15 |
| Naveen  |    70 | 2010-03-20 |
+---------+-------+------------+
```

Selecting All Columns:

Syntax: Select * from tablename;

Ex: Select * from student;

```
mysql> SELECT * FROM STUDENT;
+------+---------+-------+------------+-------+
| Rno  | name    | class | DOB        | marks |
+------+---------+-------+------------+-------+
|    1 | Nani    | 6     | 2011-03-15 |    75 |
|    2 | Mohan   | 6     | 2011-11-23 |    90 |
|    3 | Lakshmi | 6     | 2010-10-28 |    90 |
|    4 | Sunitha | 7     | 2009-12-15 |    82 |
|    5 | Naveen  | 7     | 2010-03-20 |    70 |
+------+---------+-------+------------+-------+
```

Performing calculations in output:

```
mysql> SELECT NAME,MARKS*2 FROM STUDENT;
+---------+---------+
| NAME    | MARKS*2 |
+---------+---------+
| Nani    |     150 |
| Mohan   |     180 |
| Lakshmi |     180 |
| Sunitha |     164 |
| Naveen  |     140 |
+---------+---------+
```

Reordering columns in Query Results:

Ex: SELECT CLASS,NAME FROM STUDENT;

(6) DISTINCT:

Eliminating Redundant Data (DISTINCT):

By default, data is selected from all the rows of the table. The distinct keyword eliminates duplicate rows from a result of a select statement. DISTINCT keyword is used to return only distinct (different) values.

SNo	City
1	Bvrm
2	Akd
3	Eluru
4	Hyd
5	Bvrm

Table : **CITIES**

Ex: SELECT DISTINCT CITY FROM CITIES;

CITY

Bvrm
Akd
Eluru
Hyd

ALL: The keyword ALL gives the results with duplicate values.

Ex: SELECT ALL CITY FROM CITIES;

CITY

Bvrm
Akd
Eluru
Hyd
Bvrm

(7) Performing Simple Calculations:

SQL provides dummy table "dual" to do simple calculations.

Ex: SELECT 4*3 FROM DUAL
SELECT 4+3

(8) To get system date:

Example : SELECT CURDATE( )

(9) Scalar Expressions with Selected Fields:

Ex: SELECT salesman_name, comm*100 FROM salesman;

(10) Using Column Aliases:

Ex: SELECT date,type as "Event Type" FROM Event;

(11) Handling Nulls:

The NULL value in a column can be searched for in a table using IS NULL in the WHERE clause.

Ex: SELECT Name,Marks,Address FROM Student WHERE Address **IS NULL**;

(12) Putting Text in the Query Output:

Ex: SELECT Salesman_name,comm*100,'%' FROM Salesman;

(13) WHERE Clause – Selecting Specific Rows

The WHERE clause is used to filter records.
It is used to extract only those records that fulfill a specified condition.

Syntax: SELECT column1, column2,...
FROM table_name WHERE condition;

Ex:

```
mysql> SELECT * FROM STUDENT WHERE CLASS=7;
+------+---------+-------+------------+-------+
| Rno  | name    | class | DOB        | marks |
+------+---------+-------+------------+-------+
|    4 | Sunitha | 7     | 2009-12-15 |    82 |
|    5 | Naveen  | 7     | 2010-03-20 |    70 |
+------+---------+-------+------------+-------+
```

```
mysql> SELECT * FROM STUDENT WHERE MARKS>=90;
+------+---------+-------+------------+-------+
| Rno  | name    | class | DOB        | marks |
+------+---------+-------+------------+-------+
|    2 | Mohan   | 6     | 2011-11-23 |    90 |
|    3 | Lakshmi | 6     | 2010-10-28 |    90 |
+------+---------+-------+------------+-------+
```

(14) Relational Operators:

To compare two values, a relational operator is used. The result of the comparison is true or false. They are:
=,< >(not equal to), <,<=,>,>=, !=

Ex:
SELECT CNAME FROM CITIES WHERE CNAME< >'HYDERABAD';

(15) Logical Operators:

The logical operators OR(||), AND (&&) and NOT(!) are used to connect search conditions in the WHERE clause.

Ex:
SELECT * FROM EMPLOYEE WHERE DESIGNATION='CLERK' OR DESIGNATION='MANAGER';

(16) Condition Based on a Range (Between):

Between Keyword is used to select rows which match criteria between column values. (Both values are including)

SNo	City
1	Bvrm
2	Akd
3	Eluru
4	Hyd
5	Bvrm

Table: **Cities**

Ex:
SELECT * FROM CITIES WHERE SNO BETWEEN 3 AND 5;

Sno	City
3	Eluru
4	Hyd
5	Bvrm

NOT BETWEEN – reverse of BETWEEN

(17) Conditions Based on a List (IN, NOT IN):

SNo	City
1	Bvrm
2	Akd
3	Eluru
4	Hyd
5	Bvrm

Table: **Cities**

Ex: SELECT * FROM CITIES WHERE City in ("Bvrm","Eluru");

Output:

Sno	City
1	Bvrm
3	Eluru
5	Bvrm

SELECT * FROM CITIES WHERE City Not In ("Bvrm","Eluru");

SNo	City
2	Akd
4	Hyd

(18) Condition Based on Pattern Matching:

String matching operator 'LIKE' is for comparison on character strings using patterns.

% matches any substring.

_ (underscore) matches one character.

Ex:

RNo	Name
1	Markandeyulu
2	Karun
3	Munna
4	Kalyan
5	Venkat

Table : Student

(A) SELECT * FROM STUDENT WHERE Name LIKE 'M%';

Output:

Rno	Name
1	Markandeyulu
3	Munna

(B) SELECT * FROM STUDENT WHERE Name LIKE '%y%';

Output:

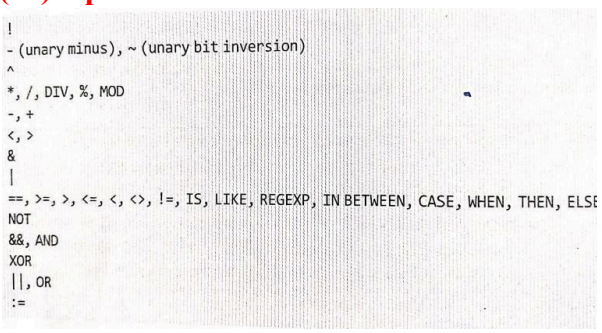
Rno	Name
1	Markandeyulu
4	Kalyan

(C) SELECT * FROM STUDENT WHERE Name LIKE '_a%';

Output:

Rno	Name
1	Markandeyulu
2	Karun
4	Kalyan

(19) Operator Precedence:



(20) Sorting Results – ORDER BY Clause:

The ORDER BY keyword is used to sort the result-set in ascending or descending order.

The ORDER BY keyword sorts the records in ascending order by default.

Keyword to Sort data in Ascending Order - ASC

Keyword to Sort data in Descending Order - DESC

```
mysql> SELECT NAME,CLASS FROM STUDENT ORDER BY CLASS;
+---------+-------+
| NAME    | CLASS |
+---------+-------+
| Nani    | 6     |
| Mohan   | 6     |
| Lakshmi | 6     |
| Sunitha | 7     |
| Naveen  | 7     |
+---------+-------+
```

```
mysql> SELECT NAME,MARKS FROM STUDENT ORDER BY MARKS DESC;
+---------+-------+
| NAME    | MARKS |
+---------+-------+
| Mohan   |    90 |
| Lakshmi |    90 |
| Sunitha |    82 |
| Nani    |    75 |
| Naveen  |    70 |
+---------+-------+
```

(21) UPDATE & SET : Used to modify data in a table.

Syntax: UPDATE <tablename> SET <columnname=newvalue> [WHERE <predicate>];

Ex: UPDATE STUDENT SET CLASS=8 WHERE NAME='Lakshmi';

UPDATE STUDENT SET MARKS=60 WHERE MARKS=75;

```
mysql> SELECT * FROM STUDENT;
+------+---------+-------+------------+-------+
| Rno  | name    | class | DOB        | marks |
+------+---------+-------+------------+-------+
|    1 | Nani    | 6     | 2011-03-15 |    60 |
|    2 | Mohan   | 6     | 2011-11-23 |    90 |
|    3 | Lakshmi | 8     | 2010-10-28 |    90 |
|    4 | Sunitha | 7     | 2009-12-15 |    82 |
|    5 | Naveen  | 7     | 2010-03-20 |    70 |
+------+---------+-------+------------+-------+
```

Updating Multiple Columns:

UPDATE Student SET Name='RajeshBabu', Marks=90 WHERE Name='Rajesh;

Using Expressions in Update:

UPDATE Student SET Marks=Marks+5;

UPDATE Employee SET gross=gross*2 WHERE (grade='E1' OR grade='E2');

Updating to NULL Values:

UPDATE Employee SET Grade=NULL WHERE grade='E4';

(22) DELETE FROM: To delete some data from a table.

Syntax: DELETE FROM <tablename> [WHERE <predicate>];

Ex:

DELETE FROM STUDENT;

(Will delete all records)

DELETE FROM STUDENT WHERE NAME='Naveen'

(Will delete Naveen's Record only)

(23) DROP TABLE: To drop a table from the database.

Syntax: DROP TABLE <tablename>;

Ex: DROP TABLE STUDENT;

(24) ALTER TABLE:

The ALTER TABLE statement is used to add, delete, or modify columns in an existing table. The ALTER TABLE statement is also used to add and drop various constraints on an existing table.

Ex:

create table student(admno int primary key, name varchar(20),marks int);

```
mysql> SELECT * FROM STUDENT;
+-------+---------+-------+
| admno | name    | marks |
+-------+---------+-------+
|     1 | Naresh  |    90 |
|     2 | Mohan   |    85 |
|     3 | Lakshmi |    95 |
+-------+---------+-------+
```

(A) ALTER TABLE - ADD Column :

To add a column in a table

syntax:

ALTER TABLE *table_name*
ADD *column_name datatype*;

Ex 1: Adding Extra attribute "Gender".

ALTER TABLE STUDENT
ADD GENDER VARCHAR(6);

```
mysql> DESC STUDENT;
+--------+-------------+------+-----+---------+-------+
| Field  | Type        | Null | Key | Default | Extra |
+--------+-------------+------+-----+---------+-------+
| admno  | int(11)     | NO   | PRI | NULL    |       |
| name   | varchar(20) | YES  |     | NULL    |       |
| marks  | int(11)     | YES  |     | NULL    |       |
| GENDER | varchar(6)  | YES  |     | NULL    |       |
+--------+-------------+------+-----+---------+-------+
```

Ex 2: Adding Extra attribute "Email".

ALTER TABLE STUDENT
ADD Email Varchar(30);

```
mysql> DESC STUDENT;
+--------+-------------+------+-----+---------+-------+
| Field  | Type        | Null | Key | Default | Extra |
+--------+-------------+------+-----+---------+-------+
| admno  | int(11)     | NO   | PRI | NULL    |       |
| name   | varchar(20) | YES  |     | NULL    |       |
| marks  | int(11)     | YES  |     | NULL    |       |
| GENDER | varchar(6)  | YES  |     | NULL    |       |
| Email  | varchar(30) | YES  |     | NULL    |       |
+--------+-------------+------+-----+---------+-------+
```

(B) ALTER TABLE - DROP COLUMN

To delete a column in a table.

Syntax:

ALTER TABLE *table_name*
DROP COLUMN *column_name*;

The following SQL deletes the "Email" column from the "Customers" table:

Example: Deleting attribute "Email".

ALTER TABLE STUDENT
DROP COLUMN Email;

```
mysql> DESC STUDENT;
+--------+-------------+------+-----+---------+-------+
| Field  | Type        | Null | Key | Default | Extra |
+--------+-------------+------+-----+---------+-------+
| admno  | int(11)     | NO   | PRI | NULL    |       |
| name   | varchar(20) | YES  |     | NULL    |       |
| marks  | int(11)     | YES  |     | NULL    |       |
| GENDER | varchar(6)  | YES  |     | NULL    |       |
+--------+-------------+------+-----+---------+-------+
```

(C) ALTER TABLE - MODIFY COLUMN:

To change the data type of a column

Syntax:

ALTER TABLE *table_name*
MODIFY COLUMN *column_name datatype*;

Example:

ALTER TABLE STUDENT
MODIFY COLUMN MARKS FLOAT;

```
mysql> DESC STUDENT;
+--------+-------------+------+-----+---------+-------+
| Field  | Type        | Null | Key | Default | Extra |
+--------+-------------+------+-----+---------+-------+
| admno  | int(11)     | NO   | PRI | NULL    |       |
| name   | varchar(20) | YES  |     | NULL    |       |
| MARKS  | float       | YES  |     | NULL    |       |
| GENDER | varchar(6)  | YES  |     | NULL    |       |
+--------+-------------+------+-----+---------+-------+
```

ADD CONSTRAINT

(D) Unique Key Constraint:

Syntax:

ALTER TABLE table_name
ADD CONSTRAINT constraint_name
UNIQUE(column_list);

Ex:

ALTER TABLE STUDENT
ADD CONSTRAINT SplConstraint
UNIQUE(Name);

(E) Adding a Primary Key in MySQL:

Ex:

ALTER TABLE STUDENT
ADD PRIMARY KEY(ADMNO);

```
mysql> DESC STUDENT;
+--------+-------------+------+-----+---------+-------+
| Field  | Type        | Null | Key | Default | Extra |
+--------+-------------+------+-----+---------+-------+
| admno  | int(11)     | NO   | PRI | NULL    |       |
| name   | varchar(20) | YES  | UNI | NULL    |       |
| MARKS  | float       | YES  |     | NULL    |       |
| GENDER | varchar(6)  | YES  |     | NULL    |       |
+--------+-------------+------+-----+---------+-------+
```

(F) Adding Check Constraint:

Other Example:

ALTER TABLE employees
ADD CONSTRAINT check_last_name
CHECK (last_name IN ('Smith', 'Anderson', 'Jones'));

(G) Adding Foreign Key Constraint:

Syntax:

ALTER TABLE table_name
ADD FOREIGN KEY (column_name)
REFERENCES table_name(Referencing column_name in table_name);

Other Example:

ALTER TABLE exam
ADD FOREIGN KEY(student_id)
REFERENCES student(student_id);

DROP CONSTRAINT

The DROP CONSTRAINT command is used to delete a UNIQUE, PRIMARY KEY, FOREIGN KEY, or CHECK constraint.

(H) DROP a UNIQUE Constraint :

To drop a UNIQUE constraint, use the following SQL:

Ex:

ALTER TABLE Student
DROP CONSTRAINT SplConstrint;

(I)DROP a PRIMARY KEY Constraint:

To drop a PRIMARY KEY constraint, use the following SQL:

Ex:

ALTER TABLE Student
DROP PRIMARY KEY;

(J)DROP a FOREIGN KEY Constraint:

To drop a FOREIGN KEY constraint, use the following SQL:

Other Ex:

ALTER TABLE Orders
DROP FOREIGN KEY FK_PersonOrder;

(K)DROP a CHECK Constraint:

To drop a CHECK constraint.

Other Ex:

ALTER TABLE Persons
DROP CHECK CHK_PersonAge;

GROUP BY IN SQL :

At times we need to fetch a group of rows on the basis of common values in a column. This can be done using a group by clause. It groups the rows together that contain the same values in a specified column. We can use the aggregate functions (COUNT, MAX, MIN, AVG and SUM) to work on the grouped values. HAVING Clause in SQL is used to specify conditions on the rows with Group By clause.

Consider the SALE table from the CARSHOWROOM database:

mysql> SELECT * FROM SALE;

InvoiceNo	CarId	CustId	SaleDate	PaymentMode	EmpID	SalePrice	Commission
I00001	D001	C0001	2019-01-24	Credit Card	E004	613247.00	73589.64
I00002	S001	C0002	2018-12-12	Online	E001	590321.00	70838.52
I00003	S002	C0004	2019-01-25	Cheque	E010	604000.00	72480.00
I00004	D002	C0001	2018-10-15	Bank Finance	E007	659982.00	79197.84
I00005	E001	C0003	2018-12-20	Credit Card	E002	369310.00	44317.20
I00006	S002	C0002	2019-01-30	Bank Finance	E007	620214.00	74425.68

CarID, CustID, SaleDate, PaymentMode, EmpID, SalePrice are the columns that can have rows with the same values in it. So, Group By clause can be used in these columns to find the number of records of a particular type (column), or to calculate the sum of the price of each car type.

Example 1.6

a) Display the number of cars purchased by each customer from the SALE table.

mysql> SELECT CustID, COUNT(*) "Number of Cars" FROM SALE GROUP BY CustID;

CustID	Number of Cars
C0001	2
C0002	2
C0003	1
C0004	1

4 rows in set (0.00 sec)

b) Display the customer Id and number of cars purchased if the customer purchased more than 1 car from SALE table.

mysql> SELECT CustID, COUNT(*) FROM SALE GROUP BY CustID HAVING Count(*)>1;

CustID	COUNT(*)
C0001	2
C0002	2

c) Display the number of people in each category of payment mode from the table SALE.

mysql>SELECT PaymentMode, COUNT (PaymentMode) FROM SALE GROUP BY Paymentmode ORDER BY Paymentmode;

PaymentMode	Count(PaymentMode)
Bank Finance	2
Cheque	1
Credit Card	2
Online	1

d) Display the PaymentMode and number of payments made using that mode more than once.

mysql>SELECT PaymentMode, Count(PaymentMode) FROM SALE GROUP BY Paymentmode HAVING COUNT(*)>1 ORDER BY Paymentmode;

PaymentMode	Count(PaymentMode)
Bank Finance	2
Credit Card	2

Activity : 1.6

a) List the total number of cars sold by each employee.
b) List the maximum sale made by each employee.

CBSE QUESTIONS – MCQs

1. The purpose of WHERE clause in a SQL statement is to:
(A) Create a table
(B) Filter rows based on a specific condition
(C) Specify the columns to be displayed
(D) Sort the result based on a column
A) (B) Filter rows based on a specific condition

2. Identify the SQL command used to delete a relation (table) from a relational database.
(A) DROP TABLE (B) REMOVE TABLE
(C) DELETE TABLE (D) ERASE TABLE
A) (A) DROP TABLE

3. State whether the following statement is True or False:
In SQL, the HAVING clause is used to apply filter on groups formed by the GROUP BY clause.
A) True

4. Fill in the Blank
The COUNT(*) function provides the total number of _____ within a relation (table) in a relational database.
(A) Columns (B) Unique values
(C) Not-null values (D) Rows
A) (D) Rows

Q-20 and Q-21 are **Assertion (A) and Reason (R)** Type questions. Choose the correct option as:
(A) Both Assertion (A) and Reason (R) are true, and Reason (R) is the correct explanation of Assertion (A)
(B) Both Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation of Assertion (A)
(C) Assertion (A) is True, but Reason (R) is False
(D) Assertion (A) is False, but Reason (R) is True

5. **Assertion (A):** In SQL, INSERT INTO is a Data Definition Language (DDL) Command.
Reason (R): DDL commands are used to create, modify, or remove database structures, such as tables.
A) (D). Assertion (A) is False, but Reason (R) is True

6. Which MySQL command helps to add a primary key constraint to any table that has already been created ?
(i) UPDATE (ii) INSERT INTO
(iii) ALTER TABLE (iv) ORDER BY

7. Which of the following clause cannot work with SELECT statement in MYSQL ?

(i) FROM **(ii) INSERT INTO**
(iii) WHERE (iv) GROUP BY

8. Which of the following SQL queries is used to retrieve rows from the " customers" table where the "email" column contains NULL values?
a. SELECT FROM customers WHERE email NULL;
b. SELECT FROM customers WHERE email IS NOT NULL;
c. SELECT FROM customers WHERE IS NULL(email);
d. SELECT FROM customers WHERE email IS NULL;
Ans. d

9. With reference to SQL, identify the **invalid data type.**
i. Date ii. Integer iii. Year **iv. Month**
(Should know all datatype names)

10. Which type of values will not be considered by
SQL while executing the following statement?
SELECT COUNT(column name) FROM inventory;
i. Numeric value ii. text value
iii. Null value iv. Date value

11. Which SQL command is used to modify the existing structure of a table?
A) ALTER TABLE

12. Write the names of any two DML commands of SQL.
A) INSERT INTO, UPDATE SET, DELETE FROM

13. Write the command to delete a table STUDENT.
A) DROP TABLE STUDENT

14. The _____command can be used to makes changes in the rows of a table in SQL.
A) Update

CBSE QUESTIONS – QUESTIONS

1.(a) Write an SQL statement to create a table named STUDENTS, with the following specifications:

Column Name	Data Type	Key
StudentID	Numeric	Primary Key
FirstName	Varchar(20)	
LastName	Varchar(10)	
DateOfBirth	Date	
Percentage	Float(10,2)	

A) CREATE TABLE STUDENTS (StudentID NUMERIC PRIMARY KEY, FirstName VARCHAR(20), LastName VARCHAR(10), DateOfBirth DATE, Percentage FLOAT(10,2));

(b). Write SQL Query to insert the following data in the Students Table
1, Supriya, Singh, 2010-08-18, 75.5
A) INSERT INTO STUDENTS (StudentID, FirstName, LastName, DateOfBirth, Percentage) VALUES (1, 'Supriya', 'Singh', '2010-08-18', 75.5);

2. Consider the following table:
PAYROLL which stores Employee ID (EMP_ID), Department (DEPARTMENT), Designation (DESIGNATION), and Salary (SALARY) for various employees.

Table: PAYROLL

EMP_ID	DEPARTMENT	DESIGNATION	SALARY
1	SALES	MANAGER	75000
2	SALES	ASSOCIATE	50000
3	ENGINEERING	MANAGER	95000
4	ENGINEERING	ENGINEER	70000
5	MARKETING	MANAGER	65000

Write appropriate SQL query to List all designations in the decreasing order of Salary.
A) SELECT DESIGNATION FROM PAYROLL **ORDER BY** SALARY **DESC**;

3. Rahul, who works as a database designer, has developed a database for a bookshop. This database includes a table BOOK whose column (attribute) names are mentioned below:
BCODE: Shows the unique code for each book.
TITLE: Indicates the book's title.
AUTHOR: Specifies the author's name.
PRICE: Lists the cost of the book.

Table: BOOK

BCODE	TITLE	AUTHOR	PRICE
B001	MIDNIGHT'S CHILDREN	SALMAN RUSHDIE	500
B002	THE GOD OF SMALL THINGS	ARUNDHATI ROY	450
B003	A SUITABLE BOY	VIKRAM SETH	600
B004	THE WHITE TIGER	ARAVIND ADIGA	399
B005	TRAIN TO PAKISTAN	KHUSHWANT SINGH	350

Write SQL query to display the Book Code and Price sorted by Price in descending order.
A) SELECT BCODE, PRICE FROM BOOK **ORDER BY** PRICE **DESC**;

4. Dr. Kavita has created a database for a hospital's pharmacy. The database includes a table named MEDICINE whose column (attribute) names are mentioned below:
MID: Shows the unique code for each medicine.
MED_NAME: Specifies the medicine name
SUPP_CITY: Specifies the city where the supplier is located.
STOCK: Indicates the quantity of medicine available.

DEL_DATE: Specifies the date when the medicine was delivered.

Table: MEDICINE

MID	MED_NAME	SUPP_CITY	STOCK	DEL_DATE
M01	PARACETAMOL	MUMBAI	200	2023-06-15
M02	AMOXICILLIN	KOLKATA	50	2023-03-21
M03	COUGH SYRUP	BENGALURU	120	2023-02-10
M04	INSULIN	CHENNAI	135	2023-01-25
M05	IBUPROFEN	AHMEDABAD	30	2023-04-05

Write the output of the following SQL Query.

Select MED_NAME from MEDICINE where STOCK between 120 and 200;

A)

MED_NAME
PARACETAMOL
COUGH SYRUP
INSULIN

5. Write any two differences between DELETE and DROP TABLE command of MySQL.

A)

DELETE	DROP TABLE
It removes some or all rows from a table.	It removes the complete table.
It doesn't remove the table structure.	It removes the table structure.
It is a DML command.	It is a DDL command.
It can be used with 'WHERE' clause	It cannot be used with 'WHERE' clause

6. Consider the table BIKES given below :

Table : **BIKES**

Bid	Bikename	Brandname	Biketype	Cost
1001	Dream Racer	Speedo	Super	1980000
1002	Splendid	Indiana	NULL	50000
1003	Silver Wing	Indiana	Touring	2300000
1004	ZZZZ	WMV	Sports	1500000
1005	CH2H	Speedo	Super	470000
1006	Astor	Victory	Normal	1700000
1007	CHANDRA	WMV	Adventure	3000000
1008	SWISS	WMV	Touring	4200000
1009	SWIFT	ROADY	Super	1900000
1010	CLOUD9	GEM	Normal	1700000

(a) Write SQL commands for the following :

(i) Display Bikenames and their corresponding Brandnames in descending order of cost.

A) SELECT Bikename, Brandname FROM BIKES ORDER BY Cost DESC;

(ii) Display Brandnames of bikes whose Biketype is not known.

A) SELECT Brandname FROM BIKES WHERE Biketype IS NULL;

(iii) Consider the following query :

SELECT*FROM BIKES WHERE Cost BETWEEN 200000 AND 3000000;

Write another query, using relational and logical operators which will produce the same output.

A) SELECT * FROM BIKES WHERE Cost >= 200000 AND Cost<=3000000;

7. Answer the following questions based on the table Sales given below :

Table : **Sales**

id	Name	City	Commission
E001	Naman Batra	Chandigarh	20
E002	Rupesh Mann	Delhi	15
E005	Ravi Gautam	Mumbai	25
E006	Mukul Singh	Delhi	30
E007	Ruby Rai	Mumbai	19
E003	Raman Roy	Kolkata	16

(ii) Write the SQL command to insert the following data in the table Sales :

id □E009

Name □ Sukumar

City □Nagpur

Commission □10

A)

INSERT INTO Sales VALUES('E009','Sukumar','Nagpur',10)

OR

INSERT INTO Sales VALUE('E009','Sukumar','Nagpur',10)

OR

INSERT INTO Sales(id, Name, City, Commision) VALUES('E009','Sukumar','Nagpur',10)

OR

INSERT INTO Sales(id, Name, City, Commision) VALUE('E009','Sukumar','Nagpur',10)

(iii) Is the command used in part (ii) a DDL or a DML command ?

A) DML

8. Ms. Sridevi is a placement head in a reputed engineering institute and has created the following table to store the records of students getting placement in various companies :

Table : **Placement**

Compid	Company Name	Vacancies	Appeared	Department	DoJ	City
CP01	Rising Star	20	300	Networking	2020-07-02	Bengaluru
CP02	Smoke Ring	30	350	Web Development	2019-07-12	Chennai
CP03	Pilot	15	421	Cloud	2020-08-12	Bengaluru
CP04	Jingle	10	145	Servers	2019-01-23	Hyderabad
CP05	Neel Zone	17	568	Data Analytics	2018-09-02	Bengaluru
CP06	Hard Talk	12	276	Marketing	2020-07-02	Hyderabad

Based on the given table, help Ms. Sridevi to write SQL queries for performing the following tasks :

(i) To list names of those companies where department is either Marketing or Networking.

A) SELECT CompanyName FROM Placement WHERE Department = 'Marketing' OR Department = 'Networking';

OR

SELECT CompanyName FROM Placement WHERE Department IN ('Marketing', 'Networking');

(iv) SELECT CompanyName FROM Placement WHERE Vacancies < 20 AND Appeared >300;

A)

CompanyName
Pilot
Neel Zone

8. Consider the tables Faculty and Batch given below :

Table : Faculty

F_Id	FacName	DoJ	Qualification	Salary
Emp01	Neeta Khanna	2013-07-01	MCA	85000
Emp02	Sonia Chawla	2023-05-05	MA	35000
Emp03	Sheetal	2015-06-28	MSc	90000
Emp04	Bindu	2016-03-30	M.Com	80000
Emp05	Sunidhi	2002-06-28	BA	100000
Emp06	Ashish	1999-07-01	B.Com	120000

Table : Batch

Batchid	BatchName	F_Id	Daysperweek	Subjects
B01	TXAlpha	Emp01	3	English
B02	TXBeta	Emp05	5	Chemistry
B03	TXGama	Emp02	4	Physics
B04	Super30	Emp03	3	Mathematics
B05	G-20	EMp04	2	Economics
B06	LXAlpha	Emp01	4	Accountancy

Write SQL queries for the following :

(i) Display name and salary of all faculties in alphabetical order of their names.

A) SELECT FacName,Salary FROM Faculty ORDER BY FacName;

OR

SELECT FacName,Salary FROM Faculty ORDER BY FacName ASC;

(ii) Display the details of all faculties whose salary is more than 60000 and have joined before the year 2007.

A) SELECT * FROM Faculty WHERE Salary>60000 AND YEAR(DoJ)<2007;

OR

SELECT * FROM Faculty WHERE Salary>60000 AND DoJ<"2007-01-01";

(iii) Increase the salary by 25% of those employees whose qualification is MCA.

A) UPDATE Faculty SET Salary = Salary+(25/100)*Salary WHERE Qualification = "MCA";

OR

UPDATE Faculty SET Salary = Salary*1.25 WHERE Qualification = "MCA";

(iv) Delete the records of batches whose subject is English.

A) DELETE FROM Batch WHERE Subject = "English";

9. Write any two differences between UPDATE and ALTER TABLE commands of MySQL.

UPDATE	ALTER TABLE
UPDATE command is used to modify value(s) stored in row(s) in a relation. It is a DML (Data Manipulation Language) command / UPDATE command performs action on data in a table. **Example** **UPDATE Student SET Marks=30 WHERE RollNo = 1;**	●ALTER TABLE command is used to add, delete, modify, rename attribute(s) in a relation ● It is a DDL(Data Definition Language) command / ALTER TABLE command performs action on the structure of the table. ●Example ALTER TABLE Student ADD Email varchar(255);

10. Answer the following question based on the table Salesman given below :

Table: Salesman

salesman_id	name	city	commission
5001	Neil Bhatt	Delhi	0.15
5002	Rohan Malik	Mumbai	0.13
5005	Ravi Mohan	Delhi	0.11
5006	Mehak Rai	Delhi	0.14
5007	Paul Lal	Bangalore	0.13
5003	Raman Sen	Kolkata	0.12

Write the MySQL query to display all the records in descending order of commission.

A) SELECT * FROM Salesman order by commission desc;

11. Rupam created a MySQL table to store the details of Nobel prize winners. Help her to write the following MySQL queries :

Table: NOBEL

Winner_id	YEAR	SUBJECT	WINNER	COUNTRY	CATEGORY
1001	1970	Physics	Hannes Alfven	Sweden	Scientist
1002	1970	Physiology	Bernard Katz	NULL	Scientist
1003	1970	Literature	Aleksandr Solzhenitsyn	Russia	Linguist
1004	1971	Chemistry	Gerhard Herzberg	Germany	Scientist
1005	1978	Peace	Menachem Begin	Israel	Prime Minister
1006	1987	Economics	Robert Solow	USA	Economist
1007	1994	Literature	Kenzaburo Oe	Japan	Linguist

(i) Display the names of Nobel Prize winner in 'Literature' for the year 1970.

A) SELECT WINNER FROM NOBEL WHERE SUBJECT="Literature" AND YEAR = 1970;

(ii) Display the subject and category of winners whose country is not known.

A) SELECT SUBJECT,CATEGORY FROM NOBEL WHERE COUNTRY IS NULL;

(iii) Display the details of all Nobel Prize winners who were Scientists.
A) SELECT * FROM NOBEL WHERE CATEGORY="Scientist";
(iv) Count total number of winners whose subject is Literature.
A) SELECT COUNT(*) FROM NOBEL WHERE SUBJECT="Literature";

12. Consider the following table Employee

Employee_id	First_name	Last_name	Salary	Joining_date	Department
E101	Monika	Das	100000	2019-01-20	Finance
E102	Mehek	Verma	600000	2019-01-15	IT
E103	Manan	Pant	890000	2019-02-05	Banking
E104	Shivam	Agarwal	200000	2019-02-25	Insurance
E105	Alisha	Singh	220000	2019-02-28	Finance
E106	Poonam	Sharma	400000	2019-05-10	IT
E107	Anshuman	Mishra	123000	2019-06-20	Banking

Write suitable SQL queries to perform the following task :
(i) Change the Department of Shivam to IT in the table Employee.
A) **UPDATE Employee SET Department="IT" WHERE First_name="Shivam";**
(ii) Remove the record of **Alisha** from the table **Employee**.
A) **DELETE FROM Employee WHERE First_name="Alisha";**

13. Consider the table Reward.

Employee_id	Date_reward	Amount
E101	2019-05-11	1000
E102	2019-02-15	5000
E103	2019-04-22	2000
E106	2019-06-20	8000

Write a query to remove the table **Reward**.
A) **DROP TABLE Reward;**

14. Consider the following records in Cars table and answer the given questions:

CarID	Make	Model	Year	Color	Price
101	Toyota	Camry	2022	Blue	25000.00
102	Honda	Civic	2021	Black	22000.00
103	Ford	Mustang	2023	Brown	35000.00
104	Chevrolet	Equinox	2022	White	28000.00
105	BMW	X5	2023	Blue	45000.00
106	Volkswagen	Golf	2021	Black	20000.00

Write command for the following To change the color of Model with code as 103 to Green
Ans. UPDATE Cars SET Color = 'Green' WHERE
CarID = 103;
Write the outputs for the following queries:

a. SELECT Make, Model FROM Cars WHERE Price 30000.00;
Ans. Make Model

Ford Mustang
BMW X5
---

b. SELECT COUNT(*) AS TotalCars FROM Cars
WHERE Year 2022;
Ans. TotalCars

2
---

c. SELECT CarID, Make, Model FROM Cars where price<22000;
Ans. CarID Make Model
---
106 Volkswagon Golf
---

15. Imagine you are assigned a task to manage the inventory of an online store. The store uses an SQL database to track product information in a table named 'Products.' The 'Products' table has columns for 'ProductID'(PrimaryKey), 'ProductName', 'Category', 'QuantityInStock,' and 'PricePerUnit.'

The following scenarios represent different inventory management tasks:

i) Restocking: Due to a recent sale, the 'QuantityInStock' of a product with 'ProductID' 101, named "Laptop," needs to be increased by 10 units.
Ans: UPDATE Products SET QuantityInStock = QuantityInStock + 10 WHERE ProductID = 101;
ii)Product Availability Check: You need to check the availability of a product named "WirelessMouse" in the 'Electronics' category.
Ans: SELECT * FROM Products WHERE ProductName = 'Wireless Mouse' AND Category = 'Electronics';
iii)ProductUpdate: The price of all products in the 'Electronics' category should be increased by 5% to account for market changes.
Ans: UPDATE Products SET PricePerUnit = PricePerUnit * 1.05 WHERE Category = 'Electronics';
iv)Out of Stock: Identify and list the products that are currently out of stock (QuantityInStock is 0).
Ans: SELECT ProductName FROM Products WHERE QuantityInStock = 0;
For each scenario, provide the SQL statements to perform the necessary action.

16. Based on the SQL table CAR_SALES, write suitable query for the following:

NUMBER	SEGMENT	FUEL	QT1	QT2
1	Compact HatchBack	Petrol	56000	70000
2	Compact HatchBack	Diesel	34000	40000
3	MUV	Petrol	33000	35000
4	MUV	Diesel	14000	15000
5	SUV	Petrol	27000	54000
6	SUV	Diesel	18000	30000
7	Sedan	Petrol	8000	10000
8	Sedan	Diesel	1000	5000

Display the records in the descending order of sales in the second quarter.

A) SELECT * FROM CAR_SALES **ORDER BY** QT2 DESC;

Predict the output of the following queries based on the table CAR_SALES given above:

SELECT (QT2-QT1)/2 "AVG SALE" FROM CAR_SALES WHERE SEGMENT= "SUV";

A) **AVG SALE**
13500.0000
6000.0000

17. Write MySQL statements for the following:

i. To create a database named FOOD.

ii. To create a table named Nutrients based on the following specification:

Column Name	Data Type	Constraints
Food_Item	Varchar(20)	Primary Key
Calorie	Integer	

A) **i.** CREATE DATABASE FOOD;

ii. CREATE TABLE NUTRIENTS (NAME VARCHAR(20) PRIMARY KEY,CALORIES INTEGER);

17. Kabir has created following table named exam:

RegNo	Name	Subject	Marks
1	Sanya	Computer Science	98
2	Sanchay	IP	100
3	Vinesh	CS	90
4	Sneha	IP	99
5	Akshita	IP	100

Help him in writing SQL queries to the perform the following task:

i. Insert a new record in the table having following values: [6,'Khushi','CS',85]

ii. To change the value "IP" to "Informatics Practices" in subject column.

iii. To remove the records of those students whose marks are less than 30 .

iv. To add a new column Grade of suitable datatype.

v. To display records of "Informatics Practices" subject.

Ans: i. INSERT INTO EXAM VALUES(6,'Khushi','CS',85);

ii. UPDATE EXAM SET subject= "Informatics Practices" where subject = "IP";

iii. DELETE FROM EXAM WHERE marks<30;

iv. ALTER TABLE EXAM ADD COLUMN grade varchar(2);

v. Select * from exam where subject="Informatics Practices";

18. Consider the following Table : ITEM :

Table : ITEM

ID	INAME	PRICE	QTY
P1001	Sketch Pen	20.50	5
P1002	Roller Ball Pen	55.00	1
P1003	Gel Pen	25.10	3
P1004	Notebook	75.80	1

Find the output of the following SQL queries :

(a) SELECT 10+ QTY FROM ITEM WHERE ID = "P1003";

(b) SELECT PRICE*QTY FROM ITEM WHERE QTY < 2;

A) **(a)** 13
(b) 55.00
75.80

19. Consider the Table FURNITURE and write SQL query

To Display all the records in alphabetical order of Item.

S.No.	Item	Type	Price	Stockdate
1	Hammock	Bedroom	35500.58	2020-04-21
2	Divan	Living	31000	2019-03-18
3	Bookshelf	Study	38000.657	2019-01-10
4	Writing Desk	Living	61357.425	2020-10-18
5	Nightstand	Bedroom	NULL	2021-07-23

A) SELECT * FROM FURNITURE **ORDER BY** ITEM ;

20. Consider the table HOTEL given below and write any four SQL commands : **Table : HOTEL**

Hotel_Id	H_Name	Location	Room_type	Price	Star
H001	The Palace	Delhi	Deluxe	4500	5
H002	The Resort	Mumbai	Deluxe	8000	7
H003	Adobe Resort	Dubai	Villa	2750	7
H004	Victoria Hill	London	Duplex	10000	3
H005	The Bee	London	Villa	30000	7

(i) Display the details of all the Hotels situated in London.

(ii) Display the details of all 'Deluxe' rooms with price more than 6000 in ascending order of Price.
(iii) Display the Hotel names that end with "e".
(iv) Count different types of rooms available in the Hotels.
(v) Display the Hotel names in descending order.

A) **i)** SELECT * FROM HOTEL WHERE Location = 'London';
(ii) SELECT * FROM HOTEL WHERE Room_type = 'Deluxe' AND Price > 6000 ORDER BY Price;

OR

SELECT * FROM HOTEL WHERE Room_type = 'Deluxe' && Price > 6000 ORDER BY Price;
(iii) SELECT H_Name FROM HOTEL WHERE H_Name LIKE '%e';

OR

SELECT * FROM HOTEL WHERE H_Name LIKE '%e';
(iv) SELECT COUNT(DISTINCT Room_type) FROM HOTEL ;
(v) SELECT H_Name FROM HOTEL ORDER BY H_Name DESC ;

OR

SELECT * FROM HOTEL ORDER BY H_Name DESC ;

21) Raunak wanted to display the list of employees who did not get commission. Therefore, he wrote the following query in SQL :

SELECT emp_name from emp where comm=NULL;

He did not get the correct answer. Identify the error and write the correct SQL statement.

A) SELECT emp_name FROM emp WHERE comm IS NULL;

22) Write the output (i and ii) for the following SQL commands : **Table: F_INDIA**

F_ID	Product	Price	Qty
F01	Sun Cream	678	10
F02	Beauty Cream	5400	15
F03	Face Glow Foundation	1704	20
F04	Gel Wax	520	10
F05	Hair Shampoo	800	25
F06	Beauty Cream	1200	32

(i) SELECT COUNT (Distinct product) FROM F_INDIA;
(ii) SELECT Product, Price FROM F_INDIA WHERE Product LIKE '%m';

A)

(i) COUNT (Distinct product)
5

(ii)

Product	Price
Sun Cream	678
Beauty Cream	5400

23. Consider the table STUDENT given below:

RollNo	Name	Class	DOB	Gender	City	Marks
1	Anand	XI	6/6/97	M	Agra	430
2	Chetan	XII	7/5/94	M	Mumbai	460
3	Geet	XI	6/5/97	F	Agra	470
4	Preeti	XII	8/8/95	F	Mumbai	492
5	Saniyal	XII	8/10/95	M	Delhi	360
6	Maakhiy	XI	12/12/94	F	Dubai	256
7	Neha	X	8/12/95	F	Moscow	324
8	Nishant	X	12/6/95	M	Moscow	429

State the command that will give the output as :

Name
Anand
Chetan
Geet
Preeti

(i). select name from student where class='XI' and class='XII';
ii. select name from student where not class='XI' and class='XII';
iii. select name from student where city="Agra" OR city="Mumbai";
iv. select name from student where city IN("Agra", "Mumbai");

Choose the correct option:

a. Both (i) and (ii).
b. Both (iii) and (iv).
c. Any of the options (i), (ii) and (iv)
d. Only (iii)

A)

(i) b. Both (iii) and (iv)
select name from student where city="Agra" or city="Mumbai";

OR

select name from student where city IN ("Agra", "Mumbai");

d. Only (iii)

iii. select name from student where city="Agra" or city="Mumbai";

(ii) What will be the output of the following command?

SELECT * FROM STUDENT WHERE GENDER ="F" ORDER BY MARKS;

a.

Rollno	Name	Class	DOB	Gender	City	Marks
4	Preeti	XII	8/8/95	F	Mumbai	492
3	Geet	XI	6/5/97	F	Agra	470
7	Neha	X	8/12/95	F	Moscow	324
6	Maakhiy	XI	12/12/94	F	Dubai	256

b.

Rollno	Name	Class	DOB	Gender	City	Marks
6	Maakhiy	XI	12/12/94	F	Dubai	256
7	Neha	X	8/12/95	F	Moscow	324
3	Geet	XI	6/5/97	F	Agra	470
4	Preeti	XII	8/8/95	F	Mumbai	492

c.

Gender	Marks
F	256
F	324
F	470
F	492

d.

Gender	Marks
F	492
F	470
F	324
F	256

A)

(ii)b.

Rollno	Name	Class	DOB	Gender	City	Marks
6	Maakhiy	XI	12/12/94	F	Dubai	256
7	Neha	X	8/12/95	F	Moscow	324
3	Geet	XI	6/5/97	F	Agra	470
4	Preeti	XII	8/8/95	F	Mumbai	492

24. Write SQL queries for (i) to (iii) and the outputs for (iv) and (v), which are based on the following table PARTICIPANTS

Table: PARTICIPANTS

PNO	EVENT	SNAME	CLASS	DOB
P1	DEBATE	SANYAM	12	2001-12-25
P2	DEBATE	SHRUTI	10	2003-11-10
P3	DEBATE	MEHER	12	2001-11-10
P4	QUIZ	SAKSHI	11	2002-10-12
P5	QUIZ	RITESH	12	2001-10-12
P6	QUIZ	RAHUL	10	2003-10-12
P7	CROSSWORD	AMEER	11	2002-05-09
P8	CROSSWORD	MINAKSHI	12	2001-05-09

(i) To display details of all PARTICIPANTS of CLASS 10 and 12

A) SELECT * FROM PARTICIPANTS WHERE CLASS IN(10,12);

OR

SELECT * FROM PARTICIPANTS WHERE CLASS =10 OR CLASS=12;

(ii) To display the SNAME and CLASS of all PARTICIPANTS in ascending order of their SNAME.

A) SELECT SNAME, CLASS FROM PARTICIPANTS ORDER BY SNAME;

(iii) SELECT DISTINCT EVENT FROM PARTICIPANTS;

A) DISTINCT EVENT

CROSSWORD

DEBATE

QUIZ

25. Shewani has recently started working in MySQL. Help her in understanding the difference between the following :

(i) Where and having clause

(ii) Count(column_name) and count(*)

A) (i)**Where clause** is used to show data set for a table based on a condition and having clause is used to put condition on the result set that comes after using Group by clause.

(ii)**COUNT(*)** returns the number of items in a group, including NULL values and duplicates. COUNT(expression) evaluates expression for each row in a group and returns the number of non null values.

Candidate Key – A Candidate Key can be any column or a combination of columns that can qualify as unique key in database. There can be multiple Candidate Keys in one table. Each Candidate Key can qualify as Primary Key.

Primary Key – A Primary Key is a column or a combination of columns that uniquely identify a record. Only one Candidate Key can be Primary Key.

A table can have multiple Candidate Keys that are unique as single column or combined multiple columns to the table. They are all candidates for Primary Key.

3. On the basis of following table answer the given questions: **Table: CUSTOMER_DETAILS**

CUST_ID	CUST_NAME	ACCT_TYPE	ACCUMLT_AMT	DOJ	GENDER
CNR_001	Manoj	Saving	101250	1992-02-19	M
CNR_002	Rahul	Current	132250	1998-01-11	M
CNR_004	Steve	Saving	18200	1998-02-21	M
CNR_005	Manpreet	Current	NULL	1994-02-19	M

(i) Write the sql query to delete the record of customerManpreet.

(iii) Write the sql query to delete the row from the table where customer has no accumulated amount.

A) **(i)** DELETE FROM CUSTOMER_DETAILS WHERE CUST_NAME='Manpreet';

(iii) Delete from Customer_Details where Accumlt_Amt is NULL;

26. Write commands in SQL for (i) to (iii) and output for (iv) and (v). **Table : Store**

StoreId	Name	Location	City	NoOfEmp	DateOpen	SalesAmt
S101	Planet Fashion	Bandra	Mumbai	7	2015-10-16	40000
S102	Vogue	Karol Bagh	Delhi	8	2015-07-14	120000
S103	Trends	Powai	Mumbai	10	2015-06-24	30000
S104	Super Fashion	Thane	Mumbai	11	2015-02-06	45000
S105	Annabelle	South Extn.	Delhi	8	2015-04-09	60000
S106	Rage	Defence Colony	Delhi	5	2015-03-01	20000

(i) To display names of stores along with Sales Amount of those stores that are located in Mumbai.

A) **(i)** SELECT NAME,SALESAMT FROM STORE WHERE CITY='MUMBAI';

(ii) To display the details of store in alphabetical order of name.

A) (ii) SELECT * FROM STORE ORDER BY NAME;

27. Consider the table FANS and answer the following. **FANS**

FAN_ID	FAN_NAME	FAN_CITY	FAN_DOB	FAN_MODE
F001	SUSHANT	MUMBAI	1998-10-02	MAIL
F002	RIYA	MUMBAI	1997-12-12	LETTER
F003	ANIKA	DELHI	2001-06-30	BLOG
F004	RUDRA	AJMER	2005-08-22	MAIL
F006	MIARA	KOLKATTA	1998-11-01	BLOG

Write MySQL queries for the following:

i. To display the details of fans in decending order of their DOB

A) **i.** SELECT * FROM FANS ORDER BY FAN_DOB DESC;

ii. To display the details of FANS who does not belong to AJMER

A) **ii.** SELECT * FROM FANS WHERE FAN_CITY < >'AJMER';

28. In CHAR(10) and VARCHAR(10) , what does the number 10 indicate?

A) It indicates the maximum number of characters that can be stored .

It indicates the Size of the column.

29. 'Employee' table has a column named 'CITY' that stores city in which each employee resides. Write SQL query to display details of all rows except those rows that have CITY as 'DELHI' or 'MUMBAI' or 'CHANDIGARH'.

A) SELECT * FROM Employee
WHERE CITY NOT IN
('DELHI','MUMBAI','CHANDIGARH');

OR

SELECT * FROM Employee WHERE CITY <>
'DELHI' AND CITY <> 'MUMBAI'
AND CITY <> 'CHANDIGARH' ;

OR

SELECT * FROM Employee
WHERE NOT CITY IN
('DELHI','MUMBAI','CHANDIGARH');

30. Consider the following table : **Table : RESULTS**

STUDENTID	NAME	EXAMID	SCORE
10	Leena	1	20
10	Leena	2	25
11	Samarth	1	30
11	Samarth	2	35
12	Jai	1	14
12	Jai	2	15
14	Shoaib	1	30
14	Shoaib	2	12

Abhay wants to know the number of students who took the test. He writes the following SQL statement to count STUDENTID without duplicates. However the statement is not correct. Rewrite the correct statement.

SELECT DISTINCT (COUNT STUDENTID) FROM RESULTS;

A) SELECT COUNT (DISTINCT STUDENTID) FROM RESULTS;

31. Consider the following table 'Transporter' that stores the order details about items to be transported. Write SQL commands for the statements (i) to (viii) and write output for SQL queries (ix) and (x)

Table : TRANSPORTER

ORDERNO	DRIVERNAME	DRIVERGRADE	ITEM	TRAVELDATE	DESTINATION
10012	RAM YADAV	A	TELEVISION	2019-04-19	MUMBAI
10014	SOMNATH SINGH		FURNITURE	2019-01-12	PUNE
10016	MOHAN VERMA	B	WASHING MACHINE	2019-06-06	LUCKNOW
10018	RISHI SINGH	A	REFRIGERATOR	2019-04-07	MUMBAI
10019	RADHE MOHAN		TELEVISION	2019-05-30	UDAIPUR
10020	BISHEN PRATAP	B	REFRIGERATOR	2019-05-02	MUMBAI
10021	RAM		TELEVISION	2019-05-03	PUNE

(i) To display names of drivers and destination city where TELEVISION is being transported.

(ii) To display driver names and destinations where destination is not MUMBAI.

(iii) To display the names of destination cities where items are being transported. There should be no duplicate values.

(iv) To display details of rows that have some value in DRIVERGRADE column.

(v) To display names of drivers, names of items and travel dates for those items that are being transported on or before 1st April 2019.
(vi) To display the number of drivers who have 'MOHAN' anywhere in their names.
(vii) To display the names of drivers, item names and travel dates in alphabetic(ascending) order of driver names.
(viii) To display names of drivers whose names are three characters long

A)
(i) SELECT DRIVERNAME, DESTINATION FROM TRANSPORTER WHERE ITEM="TELEVISION";
(ii) SELECT DRIVERNAME, DESTINATION FROM TRANSPORTER WHERE DESTINATION <> "MUMBAI";
OR
SELECT DRIVERNAME, DESTINATION FROM TRANSPORTER WHERE DESTINATION != "MUMBAI";
OR
SELECT DRIVERNAME, DESTINATION FROM TRANSPORTER WHERE DESTINATION NOT IN ("MUMBAI");
OR
SELECT DRIVERNAME, DESTINATION FROM TRANSPORTER WHERE NOT DESTINATION = "MUMBAI";
(iii) SELECT DISTINCT(DESTINATION) FROM TRANSPORTER;
(iv) SELECT * FROM TRANSPORTER WHERE DRIVERGRADE IS NOT NULL;
(v) SELECT DRIVERNAME, ITEM, TRAVELDATE FROM TRANSPORTER WHERE TRAVELDATE <= "2019-04-01";
(vi) SELECT COUNT(DRIVERNAME) FROM TRANSPORTER WHERE DRIVERNAME LIKE "%MOHAN%" ;
(vii) SELECT DRIVERNAME, ITEM, TRAVELDATE FROM TRANSPORTER ORDER BY DRIVERNAME;
[OR ORDER BY DRIVERNAME ASC;]
(viii) SELECT DRIVERNAME FROM TRANSPORTER WHERE DRIVERNAME LIKE "_ _ _";
OR
SELECT DRIVERNAME
FROM TRANSPORTER
WHERE LENGTH(DRIVERNAME) = 3 ;

32. Mr. Sen has to create a table named 'Employee' with Columns to store EmpID, Name, Designation, Age and Salary.EmpID is the Primary Key and Name cannot be NULL. **Some of the rows that will be inserted are shown below.**

101 Smita Kumar Secretary 28 39500.00
102 Mani Scott Programmer 32 45300.00
103 Firdaus Ali Programmer II 45 67500.00

Write SQL query to create the above table with appropriate data types and sizes of columns

A)
```
CREATE TABLE Employee
 (EmpID INTEGER PRIMARY KEY,
  Name VARCHAR(20) NOT NULL ,
  Designation VARCHAR(20),
  Age INTEGER ,
  Salary DECIMAL(8,2) );
```

33. Ms.Rajshri is the class teacher of class XII. She wants to create a table named 'Student' to store marks in different subjects of her class. Identify any 4 columns for the table along with their suitable data types .

A)

Admno	INT/CHAR / VARCHAR
Name	CHAR / VARCHAR
Mark1	DECIMAL / FLOAT / INT / INTEGER
Mark2	DECIMAL / FLOAT / INT / INTEGER

34. Ajay has applied a Constraint on a column(field) such that Ajay will certainly have to insert a value in this field, when he inserts a new row in the table. Which constraint has Ajay used?
A) NOT NULL constraint

35. 'STUDENT' table has a column named 'REMARK' that stores Remarks. The values stored in REMARK are "PASS" or "NOT PASS" or "COMPTT" etc.
Write SQL query to display details of all rows except those that have REMARK as "PASS" .

A)
SELECT * FROM student WHERE Remark NOT IN ('PASS'); **OR**
SELECT * FROM student WHERE NOT Remark IN ('PASS'); **OR**
SELECT * FROM student WHERE Remark <> 'PASS'; **OR**
SELECT * FROM student WHERE Remark !='PASS'; **OR**
SELECT * FROM student WHERE Remark IN

(‘NOT PASS’,’COMPTT’) ;

36. Consider the table: ITEM. Write SQL statement to delete the last row.

PRODUCTID	PRODUCTCODE	QTY	PRICE
101	PEN	500	20.00
102	PEN	800	10.00
103	PEN	1000	20.00
104	PENCIL	700	10.00
105	PENCIL	800	20.00

A) DELETE FROM ITEM WHERE PRODUCTID=105;

37. While creating a table,when a column is declared with data type and size as : DECIMAL(20,6) , how many maximum number of digits may be present to the right of the decimal point? Which command in SQL is used to see the structure of the table?

A) 6

DESC / DESCRIBE / SHOW FIELDS FROM <TABLE NAME>;

38. Consider the following table ‘Activity’. Write SQL commands for the statements (i) to(viii) and write output for SQL queries (ix) and (x).

Table : Activity

PID	PARTICIPANT	GRADE	EVENT	POINTS	EVENTDATE	HOUSE
101	Amit Dubey	A	Running	200	2018-12-19	Gandhi
102	Shivraj Singh		Hopping bag	300	2019-01-12	Bose
103	Raj Arora	B	Skipping	200	2018-12-19	Gandhi
104	Kapil Raj	A	Bean bag	250	2018-12-19	Bhagat
105	Deepshikha Sen	A	Obstacle	350	2018-03-31	Bose
106	Saloni Raj		Egg & Spoon	200	2018-12-20	Bose

(i) To display names of Participants and points in descending order of points.

(ii) To display names and points of participants who have scored points in the range 200 and 300 (both values included).

(iv) To display the names and EVENTDATE of participants who took part in the event anytime in the month of December of 2018.

(v) To display names of events that have ‘bag’ anywhere in the event names.

(vi) To change the name of Event “Egg&Spoon” to “Lemon&Spoon” everywhere in the table “Activity”

(vii) To display the average POINTS of all the Participants who have got some grade.

(x) SELECT COUNT(DISTINCT POINTS) FROM ACTIVITY;

A) **(i)** SELECT PARTICIPANT,POINTS FROM Activity ORDER BY POINTS DESC;

(ii) SELECT PARTICIPANT,POINTS FROM Activity WHERE POINTS BETWEEN 200 AND 300;

OR

SELECT PARTICIPANT,POINTS FROM Activity WHERE POINTS>=200 AND POINTS<=300;

(iv) SELECT PARTICIPANT,EVENTDATE FROM Activity WHERE EVENTDATE BETWEEN ‘ 2018-12-01 ‘ AND ‘ 2018-12-31 ‘ ;

OR

SELECT PARTICIPANT,EVENTDATE FROM Activity WHERE EVENTDATE>= ‘ 2018-12-01 ‘ AND EVENTDATE<= ‘ 2018-12-31 ‘ ;

(v) SELECT EVENT FROM Activity WHERE EVENT LIKE ‘ %bag% ‘ ;

(vi) UPDATE Activity SET EVENT = ‘Lemon&Spoon’ WHERE EVENT = ‘Egg&Spoon’;

(vii) SELECT AVG(points) FROM Activity WHERE GRADE IS NOT NULL;

(x) COUNT(DISTINCT POINTS)

4

39. Write SQL query to create a table ‘Transporter’ with the following structure:

Field	Type	Constraint
OrderlId	Integer	Primary key
DriverName	Varchar(50)	NOT NULL
ItemTransported	Varchar(50)	
TravelDate	Date	
DestinationCity	Varchar(50)	

A)

```
CREATE TABLE Transporter
  ( OrderlId INTEGER PRIMARY KEY,
    DriverName VARCHAR(50)NOT NULL,
    ItemTransported VARCHAR(50),
    TravelDate DATE,
    DestinationCity VARCHAR(50) );
```

ALTER TABLE

1. Consider the Table: Employee

Employee_ id	First_ name	Last_ name	Salary	Joining_date	Department
E101	Monika	Das	100000	2019-01-20	Finance
E102	Mehek	Verma	600000	2019-01-15	IT
E103	Manan	Pant	890000	2019-02-05	Banking
E104	Shivam	Agarwal	200000	2019-02-25	Insurance
E105	Alisha	Singh	220000	2019-02-28	Finance
E106	Poonam	Sharma	400000	2019-05-10	IT
E107	Anshuman	Mishra	123000	2019-06-20	Banking

Write suitable SQL query to perform the following task :

(iii) Add a new column **Experience** of integer type in the table **Employee**.

A) ALTER TABLE Employee ADD Experience int;

OR

ALTER TABLE Employee ADD COLUMN Experience int;

2. Suppose you already have " table in the " database, as described below:

Table Name: Nutrients

Column Name: Food_Item (VARCHAR)

Column Name: Calorie (INT)

Write SQL statements to perform the following tasks:

i. Add a new column named "Plan_Start_Date"(Date) to the "Nutrients" table.

Ans. ALTER TABLE Nutrients ADD Plan_Start_Date DATE;

ii. Modify the "Calorie" column to change its data type to Float.

Ans. ALTER TABLE Nutrients MODIFY Calorie FLOAT;

3. Write SQL command to add a column "COUNTRY" with data type and size as VARCHAR(70) to the existing table named "PLAYER". Is it a DDL or DML or TCL command?

A) ALTER TABLE PLAYER ADD COUNTRY VARCHAR(70); It is a DDL command

GROUP BY

1. Consider the following table:

PAYROLL which stores Employee ID (EMP_ID), Department (DEPARTMENT), Designation (DESIGNATION), and Salary (SALARY) for various employees.

Table: PAYROLL

EMP_ID	DEPARTMENT	DESIGNATION	SALARY
1	SALES	MANAGER	75000
2	SALES	ASSOCIATE	50000
3	ENGINEERING	MANAGER	95000
4	ENGINEERING	ENGINEER	70000
5	MARKETING	MANAGER	65000

Write appropriate SQL query for the following:

Display department-wise average Salary.

A) SELECT DEPARTMENT, **AVG**(SALARY) FROM PAYROLL **GROUP BY** DEPARTMENT;

2. Consider the following table:

MEDALS, which stores AthleteID, Sport, and Medals. The table displays the number of medals won by each athlete in their respective sports.

Table: MEDALS

AthleteID	Sport	Medals
101	Swimming	8
102	Track	3
103	Gymnastics	5
104	Swimming	2
105	Track	6

Write appropriate SQL query for the following:

Display the sports-wise total number of medals won.

A) SELECT SPORT,SUM(Medals) FROM MEDALS GROUP BY SPORT;

3. Consider the table BIKES given below :

Table : **BIKES**

Bid	Bikename	Brandname	Biketype	Cost
1001	Dream Racer	Speedo	Super	1980000
1002	Splendid	Indiana	NULL	50000
1003	Silver Wing	Indiana	Touring	2300000
1004	ZZZZ	WMV	Sports	1500000
1005	CH2H	Speedo	Super	470000
1006	Astor	Victory	Normal	1700000
1007	CHANDRA	WMV	Adventure	3000000
1008	SWISS	WMV	Touring	4200000
1009	SWIFT	ROADY	Super	1900000
1010	CLOUD9	GEM	Normal	1700000

Predict the output of the following queries based on the table BIKES given above :

SELECT SUM(Cost), Brandname FROM BIKES GROUP BY Brandname Having Brandname = "WMV" OR Brandname = "Indiana";

A)

SUM(Cost)	Brandname
2350000	Indiana
8700000	WMV

33. Consider the table Batch:

Table : Batch

Batchid	BatchName	F_Id	Daysperweek	Subjects
B01	TXAlpha	Emp01	3	English
B02	TXBeta	Emp05	5	Chemistry
B03	TXGama	Emp02	4	Physics
B04	Super30	Emp03	3	Mathematics
B05	G-20	EMp04	2	Economics
B06	LXAlpha	Emp01	4	Accountancy

Write a query to display maximum days per week for each F_Id from the table Batch.

A) SELECT F_Id, MAX(Daysperweek)FROM Batch GROUP BY F_Id;

34. Excellent Consultancy Pvt. Ltd. maintains two tables for all its employees.

Table: Employee

Employee_ id	First_ name	Last_ name	Salary	Joining_date	Department
E101	Monika	Das	100000	2019-01-20	Finance
E102	Mehek	Verma	600000	2019-01-15	IT
E103	Manan	Pant	890000	2019-02-05	Banking
E104	Shivam	Agarwal	200000	2019-02-25	Insurance
E105	Alisha	Singh	220000	2019-02-28	Finance
E106	Poonam	Sharma	400000	2019-05-10	IT
E107	Anshuman	Mishra	123000	2019-06-20	Banking

Write suitable SQL query for the following task:

Display each department name and its corresponding average salary.

A) SELECT Department, AVG(Salary) FROM Employee GROUP BY Department;

12. You have a table called "employees" with columns "department" and "salary." You want to find the highest salary in each department and

display the results in descending order of salary. Which SQL clauses should you use for this query?

a. GROUP BY, HAVING, ORDER BY
b. GROUP BY, ORDER BY
c. HAVING, ORDER BY
d. HAVING GROUP BY

Ans. b

25. Clarify the role of the HAVING clause highlighting its distinctions from the WHERE clause in SQL.

Ans. HAVING clause in SQL is used to filter the results of a GROUP BY query based on aggregated values.

Distinction of having clause from where clause:

The WHERE clause is applied to individual rows in the original dataset before any grouping is performed. It filters rows based on specific column conditions.

While HAVING clause is applied to grouped results after the GROUP BY operation. It filters groups based on aggregated values, such as SUM, COUNT, AVG, etc.

8. Raj, a Database Administrator, needs to display the average pay of workers from those departments which have more than five employees. He is experiencing a problem while running the following query:

SELECT DEPT, AVG(SAL) FROM EMP WHERE COUNT(*) > 5 GROUP BY DEPT;

Which of the following is a **correct query** to perform the given task?

i. SELECT DEPT, AVG(SAL) FROM EMP WHERE COUNT(*) > 5 GROUP BY DEPT;
ii. SELECT DEPT, AVG(SAL) FROM EMP HAVING COUNT(*) > 5 GROUP BY DEPT;
iii. SELECT DEPT, AVG(SAL) FROM EMP GROUP BY DEPT WHERE COUNT(*) > 5;
iv. SELECT DEPT, AVG(SAL) FROM EMP GROUP BY DEPT HAVING COUNT(*) > 5;

26. Based on the SQL table CAR_SALES, write suitable queries for the following:

NUMBER	SEGMENT	FUEL	QT1	QT2
1	Compact HatchBack	Petrol	56000	70000
2	Compact HatchBack	Diesel	34000	40000
3	MUV	Petrol	33000	35000
4	MUV	Diesel	14000	15000
5	SUV	Petrol	27000	54000
6	SUV	Diesel	18000	30000
7	Sedan	Petrol	8000	10000
8	Sedan	Diesel	1000	5000

i. Display fuel wise average sales in the first quarter.

ii. Display segment wise highest sales in the second quarter.

A) i. SELECT FUEL, AVG(QT1) FROM CAR_SALES GROUP BY FUEL;
ii. SELECT SEGMENT, MAX(QT2) FROM CAR_SALES GROUP BY SEGMENT;

(34) Consider the following table **Schooldata** :

Table: Schooldata

Admno	Name	Grade	Club	Marks	Gender
20150001	Sargam Singh	12	STEM	86	Male
20140212	Alok Kumar	10	SPACE	75	Male
20090234	Mohit Gaur	11	SPACE	84	Male
20130216	Romil Malik	10	READER	91	Male
20190227	Tanvi Batra	11	STEM	70	Female
20120200	Nomita Ranjan	12	STEM	64	Female

Write SQL queries for the following:

(i) Display the average Marks secured by each Gender.

(ii) Display the minimum Marks secured by the students of Grade 10.

(iii) Display the total number of students in each Club where number of students are more than 1.

(OR) (Option for Part (iii) only)

(iii) Display the maximum and minimum marks secured by each gender.

A)

(34) (i) SELECT Gender, AVG(marks) FROM Schooldata GROUP BY Gender;

(ii) SELECT MIN(Marks) FROM Schooldata
WHERE Class=10; **OR**
SELECT MIN(Marks) FROM Schooldata
WHERE Class='10';

(iii) SELECT Club, COUNT(*) FROM Schooldata
GROUP BY Club HAVING COUNT(*)>1;

(OR)

(iii) SELECT MAX(Marks),MIN(Marks), Gender
FROM Schooldata GROUP BY Gender;

9. _____ helps to fetch a group of rows based on common values in a column.

(a) ORDER BY (b) FILTER
(c) GROUP BY (d) SELECT BY

20. Arpit wants to find the total commission earned by those departments where the number of employees in the department is more than 2 and writes the following query :

Select department, count(commission) from TECHNO having count(*)>2 group by department;

But he got an error. Identify the error(s) and rewrite the query by underlining the correction(s) done.

A)

20. Error 1 : SUM(commission) in place of count(commission)
Error 2 : having should be after group by

Corrected Query:

SELECT department, SUM(commission) FROM TECHNO GROUP BY department HAVING count(*)>2 ;

21. Consider the following table Student :

Table: STUDENT

Admn	Name	Class	Optional	Marks
1001	Tony	10	AI	90
1002	Ivana	11	IP	95
1003	Nick	10	IT	85
1004	Sandy	11	IP	80
1005	Kavya	11	IP	92

Write SQL queries for the following:

a) Display the Total Marks secured by students of each class.

b) Display the Average Marks secured by the students of IP optional subject

c) Display the total number of students in each Class where the number of students are more than 2.

(OR)

Display the maximum and minimum marks secured in 7each optional subject.

A) SELECT Class, SUM(Marks)
FROM STUDENT GROUP BY Class;
OR
SELECT Class, SUM(Marks) "Total Marks"
FROM STUDENT GROUP BY Class;
OR
SELECT SUM(Marks)
FROM STUDENT GROUP BY Class;

b) SELECT AVG(Marks) FROM STUDENT WHERE Optional="IP";

c) SELECT Class, COUNT(*) FROM STUDENT GROUP BY Class HAVING COUNT(*)>2;
OR
SELECT COUNT(*) FROM STUDENT
GROUP BY Class HAVING COUNT(*)>2;
(OR) for c
SELECT Optional, MAX(Marks), MIN(Marks) FROM STUDENT GROUP BY Optional;
OR
SELECT MAX(Marks), MIN(Marks) FROM STUDENT GROUP BY Optional;

(22) Keshav has written the following query to find out the sum of bonus earned by the employees of WEST zone :

SELECT zone, TOTAL (bonus) FROM employee HAVING zone = 'WEST';

But he got an error. **Identify the errors and rewrite the query by underlining the correction(s) done**.

A) SELECT zone, SUM(bonus) FROM employee
WHERE Zone = 'WEST';
OR
SELECT SUM(bonus) FROM employee WHERE Zone = 'WEST';
OR
SELECT zone, SUM(bonus) FROM employee
GROUP BY zone HAVING Zone = 'WEST' ;

20. Rashmi, a database administrator needs to display house wise total number of records of 'Red' and 'Yellow' house. She is encountering an error while executing the following query:

SELECT HOUSE, COUNT (*) FROM STUDENT GROUP BY HOUSE WHERE HOUSE='RED' OR HOUSE= 'YELLOW';

Help her in identifying the reason of the error and write the correct query by suggesting the possible correction (s).

A)

The problem with the given SQL query is that WHERE clause should not be used with Group By clause.
To correct the error, HAVING clause should be used instead of WHERE.

Corrected Query:

SELECT HOUSE, COUNT(*) FROM STUDENT GROUP BY HOUSE HAVING HOUSE= 'RED' OR HOUSE='YELLOW';

30. Based on table STUDENT given here, write suitable SQL queries for the following:

Roll No	Name	Class	Gender	City	Marks
1	Abhishek	XI	M	Agra	430
2	Prateek	XII	M	Mumbai	440
3	Sneha	XI	F	Agra	470
4	Nancy	XII	F	Mumbai	492
5	Himnashu	XII	M	Delhi	360
6	Anchal	XI	F	Dubai	256
7	Mehar	X	F	Moscow	324
8	Nishant	X	M	Moscow	429

i. Display gender wise highest marks.
ii. Display city wise lowest marks.
iii. Display total number of male and female students.

A) **i.** select max(marks) from student group by gender;
ii. select min(marks) from student group by city;
iii. select gender,count(gender) from student group by gender;

OR

Discuss the significance of Group by clause in detail with the help of suitable example.

A) **GROUP BY** clause is used in a SELECT statement in combination with aggregate functions to group the result based on distinct values in a column.

For example:

To display total number of male and female students from the table STUDENT, we need to first group records based on the gender then we should count records with the help of count() function.

Considering the following table STUDENT:

RollNo	Name	Class	Gender	City	Marks
1	Abhishek	XI	M	Agra	430
2	Prateek	XII	M	Mumbai	440
3	Sneha	XI	F	Agra	470
4	Nancy	XII	F	Mumbai	492
5	Himnashu	XII	M	Delhi	360
6	Anchal	XI	F	Dubai	256
7	Mehar	X	F	Moscow	324
8	Nishant	X	M	Moscow	429

SQL query for the above-mentioned task is as follows: select gender, count(gender) from student group by gender;

Output:

Gender	Count(Gender)
M	4
F	4

34. Shreya, a database administrator has designed a database for a clothing shop. Help her by writing answers of the following questions based on the given table: **TABLE: CLOTH**

CCODE	CNAME	SIZE	COLOR	PRICE	DOP
C001	JEANS	XL	BLUE	990	2022-01-21
C002	T SHIRT	M	RED	599	2021-12-12
C003	TROUSER	M	GREY	399	2021-11-10
C004	SAREE	FREE	GREEN	1299	2019-11-12
C005	KURTI	L	WHITE	399	2021-12-07

iii. Write a query to count total number of cloths purchased of medium size.

OR (Option for part iii only)

Write a query to count year wise total number of cloths purchased.

A)

34.

iii. SELECT COUNT(*) FROM CLOTH GROUP BY SIZE HAVING SIZE='M'; **OR** SELECT YEAR(DOP),COUNT(*) FROM CLOTH GROUP BY YEAR(DOP);

6. Harjat has created the table EMP in his database.

Table : EMP

E_Id	Name	Dept	Comm
E001	Ditya	Admin	35000
E002	Uzair	Production	42500
E003	Rajnikant	Admin	21000
E004	Moushami	Sales	23575
E005	Samantha	Sales	37000
E006	Sunder	Admin	43000

Now he wants to find the sum of commission earned by each department. He has executed the following query : **SELECT dept,sum(comm) GROUP BY dept FROM EMP;**

But, he got an error. Rewrite the correct query after identifying the error(s).

A) SELECT dept,sum(comm) FROM EMP GROUP BY dept ;

11. Consider the Table FURNITURE with the following data : Table : FURNITURE

S.No.	Item	Type	Price	Stockdate
1	Hammock	Bedroom	35500.58	2020-04-21
2	Divan	Living	31000	2019-03-18
3	Bookshelf	Study	38000.657	2019-01-10
4	Writing Desk	Living	61357.425	2020-10-18
5	Nightstand	Bedroom	NULL	2021-07-23

Write SQL queries for the following :

(b) Display the Type and total number of items of each Type.

A) **(b)** SELECT TYPE, COUNT(ITEM) FROM FURNITURE GROUP BY TYPE;

6. Srikanth created the following table STUDENT in his database. **(2)**

Table : Student

RollNo	Name	Class	Marks
1	Ritika	12	40
2	Angad	12	35
3	Kaveri	11	42
4	Lalitha	12	21
5	Daniel	11	44
6	Rabindra	11	39
7	Rabia	11	28

He now wants to count number of students in each class where the number of students is more than 3. He has executed the following query.

SELECT MAX(Marks) FROM STUDENT
WHERE COUNT(*)>3 GROUP BY Class;

But he got an error. **Identify the error(s) and rewrite the query. Also underline the correction(s)** done.

A)

A) SELECT Class, COUNT(*) FROM STUDENT GROUP BY Class having Count(*)>3;

OR

Table : SALESMAN

Scode	Sname	Area	Qtysold	Dateofjoin
S001	Ravi	North	120	2015-10-01
S002	Sandeep	South	105	2012-08-01
S003	Sunil	NULL	68	2018-02-01
S004	Subh	West	280	2010-04-01
S005	Ankit	East	90	2018-10-01
S006	Raman	North	NULL	2019-12-01

Based on the given table SALESMAN write SQL queries to perform the following operations:

(ii) Display the maximum qtysold from each area.

(iii) Display the average qtysold from each area where number of salesman is more than 1.

A)

(ii) SELECT Area, MAX(Qtysold) FROM SALESMAN GROUP BY Area;

(iii) SELECT Area,AVG(qtysold) FROM SALESMAN GROUP BY AREA HAVING COUNT(*)>1;

6. Aryan, a database administrator, has grouped records of a table with the help of **group by** clause.

He needs to further filter groups of records generated through group by clause.

Suggest suitable clause for it and **properly explain its usage** with the help of an example.

A) **Having** clause is used to further filter those groups of records which will be generated through group by clause.

For example:

Select max(marks) from student group by classes having classes in (10,12);

Above given query will arrange records in groups according to the classes. Further filtering on these groups will happen through having clause, which will finally display the highest marks from classes 10 and 12.

b) Can we use Where clause after Group By clause ? Name the clause which is used to restrict the number of records returned by the Group By clause.

A) No

HAVING

37) Consider the following table School :

Table : School

Admno	Name	Class	House	Percentage	Gender
20150001	Abhishek Kumar	10	Green	86	Male
20140212	Mohit Bhardwaj	11	Red	75	Male
20090234	Ramandeep Kaur	10	Yellow	84	Female
20130216	Mukesh Sharma	9	Red	91	Male
20190227	Rahil Arora	10	Blue	70	Male
20120200	Swapnil Bhatt	11	Red	64	Female

Write SQL queries for the following :

(a) Display the total number of students in each House where number of students are more than 2.

(b) Display the average Percentage of girls and boys.

A)

37) (a) SELECT COUNT(*), House FROM School GROUP BY House HAVING COUNT(*)>2 ;

(b) SELECT AVG(Percentage), Gender FROM School GROUP BY Gender ;

What is the difference between the order by and group by clause when used along with the **select** statement. Explain with an example.

A)

The **order by** clause is used to show the contents of a table/relation in a sorted manner with respect to the column mentioned after the order by clause. The contents of the column can be arranged in ascending or descending order.

The **group by** clause is used to group rows in a given column and then **group by** apply an aggregate function eg max(), min() etc on the entire group.

37. A relation Vehicles is given below : (3)

V_no	Type	Company	Price	Qty
AW125	Wagon	Maruti	250000	25
J0083	Jeep	Mahindra	4000000	15
S9090	SUV	Mitsubishi	2500000	18
M0892	Mini van	Datsun	1500000	26
W9760	SUV	Maruti	2500000	18
R2409	Mini van	Mahindra	350000	15

Write SQL commands to:

a. Display the average price of each type of vehicle having quantity more than 20.

b. Count the type of vehicles manufactured by each company.

c. Display the total price of all the types of vehicles.

A)

a. select Type, avg(Price) from Vehicle group by Type having Qty>20;

b. select Company, count(distinct Type) from Vehicle group by Company;

c. Select Type, sum(Price* Qty) from Vehicle group by Type;

4h) Write SQL queries for (i) to (iii) and the outputs for (iv) and (v), which are based on the following table **PARTICIPANTS**

Table: PARTICIPANTS				
PNO	EVENT	SNAME	CLASS	DOB
P1	DEBATE	SANYAM	12	2001-12-25
P2	DEBATE	SHRUTI	10	2003-11-10
P3	DEBATE	MEHER	12	2001-11-10
P4	QUIZ	SAKSHI	11	2002-10-12
P5	QUIZ	RITESH	12	2001-10-12
P6	QUIZ	RAHUL	10	2003-10-12
P7	CROSSWORD	AMEER	11	2002-05-09
P8	CROSSWORD	MINAKSHI	12	2001-05-09

(iii) To display the number of PARTICIPANTS along with their respective CLASS, of every CLASS.

A)

SELECT COUNT(*), CLASS FROM PARTICIPANTS GROUP BY CLASS;

(v) SELECT MAX(DOB), PNO FROM PARTICIPANTS GROUP BY PNO HAVING COUNT(*)>1;

A)

MAX(DOB)

2003-11-10

4h) Write commands in SQL for (i) to (iii) and output for (iv) and (v). **Table : Store**

StoreId	Name	Location	City	NoOfEmp	DateOpen	SalesAmt
S101	Planet Fashion	Bandra	Mumbai	7	2015-10-16	40000
S102	Vogue	Karol Bagh	Delhi	8	2015-07-14	120000
S103	Trends	Powai	Mumbai	10	2015-06-24	30000
S104	Super Fashion	Thane	Mumbai	11	2015-02-06	45000
S105	Annabelle	South Extn.	Delhi	8	2015-04-09	60000
S106	Rage	Defence Colony	Delhi	5	2015-03-01	20000

(iii) To display the City and the number of stores located in that City, only if number of stores is more than 2.

A) (iii)SELECT CITY, COUNT(*) FROM STORE

GROUP BY STORE HAVING COUNT(*)>2;

(v) SELECT COUNT(STOREID), NOOFEMP FROM STORE GROUP BY NOOFEMP HAVING MAX(SALESAMT)<60000;

A)

```
+----------------+---------+
| Count(StoreId) | NoOfEmp |
+----------------+---------+
| 1              |    10   |
| 1              |    11   |
| 1              |     5   |
| 1              |     7   |
+----------------+---------+
```

(i) Consider the table FANS and answer the following. **FANS**

FAN_ID	FAN_NAME	FAN_CITY	FAN_DOB	FAN_MODE
F001	SUSHANT	MUMBAI	1998-10-02	MAIL
F002	RIYA	MUMBAI	1997-12-12	LETTER
F003	ANIKA	DELHI	2001-06-30	BLOG
F004	RUDRA	AJMER	2005-08-22	MAIL
F006	MIARA	KOLKATTA	1998-11-01	BLOG

iii. To count the total number of fans of each fan mode

A) **iii.** SELECT FAN_MODE, COUNT(*) FROM FANS GROUP BY FAN_MODE;

d) Aman has used the following SQL command to create a table 'stu':

```
CREATE TABLE stu
  ( id INTEGER,
    name VARCHAR(100)
   );
```

Then,Aman enters the following SQL statements to enter 4 rows: INSERT INTO stu VALUES(1,"abc");

```
INSERT INTO stu VALUES(2,"abc");
INSERT INTO stu VALUES(3,"bcd");
```

Write the output that will be produced by the following SQL statement :

SELECT name, Count(*) FROM stu GROUP BY name;

A)

NAME	COUNT(*)
abc	2
bcd	1

5. Consider the following table 'Transporter' that stores the order details about items to be transported. Write SQL commands for the statements (i) to (viii) and write output for SQL queries (ix) and (x)

Table : TRANSPORTER

ORDERNO	DRIVERNAME	DRIVERGRADE	ITEM	TRAVELDATE	DESTINATION
10012	RAM YADAV	A	TELEVISION	2019-04-19	MUMBAI
10014	SOMNATH SINGH		FURNITURE	2019-01-12	PUNE
10016	MOHAN VERMA	B	WASHING MACHINE	2019-06-06	LUCKNOW
10018	RISHI SINGH	A	REFRIGERATOR	2019-04-07	MUMBAI
10019	RADHE MOHAN		TELEVISION	2019-05-30	UDAIPUR
10020	BISHEN PRATAP	B	REFRIGERATOR	2019-05-02	MUMBAI
10021	RAM		TELEVISION	2019-05-03	PUNE

(ix) SELECT ITEM,COUNT(*) FROM TRANSPORTER GROUP BY ITEM HAVING COUNT(*) > 1;

A)

(ix)

ITEM	COUNT(*)
TELEVISION	3
REFRIGERATOR	2

(b) Consider the following tables PARTICIPANT and ACTIVITY and answer the questions that follow:

Table: PARTICIPANT

ADMNO	NAME	HOUSE	ACTIVITYCODE
6473	Kapil Shah	Gandhi	A105
7134	Joy Mathew	Bose	A101
8786	Saba Arora	Gandhi	A102
6477	Kapil Shah	Bose	A101
7658	Faizal Ahmed	Bhagat	A104

Table: ACTIVITY

ACTIVITYCODE	ACTIVITYNAME	POINTS
A101	Running	200
A102	Hopping bag	300
A103	Skipping	200
A104	Bean bag	250
A105	Obstacle	350

(c) With reference to the above given tables (in Q6 b), write commands in SQL for (i) to (iii)

(i) To display Activity Code along with number of participants participating in each activity (Activity Code wise) from the table Participant.

(OR)

How many rows will be there in the cartesian product of the two tables in consideration here ?

A)

)(i) SELECT ACTIVITYCODE,COUNT(*)
FROM PARTICIPANT
GROUP BY ACTIVITYCODE;

OR

SELECT CONCAT(ACTIVITYCODE,COUNT(*)) FROM PARTICIPANT GROUP BY ACTIVITYCODE;

(OR)

Number of Rows:25

5. Consider the following table 'Activity'. Write SQL commands for the statements (i) to(viii) and write output for SQL queries (ix) and (x).

Table : Activity

PID	PARTICIPANT	GRADE	EVENT	POINTS	EVENTDATE	HOUSE
101	Amit Dubey	A	Running	200	2018-12-19	Gandhi
102	Shivraj Singh		Hopping bag	300	2019-01-12	Bose
103	Raj Arora	B	Skipping	200	2018-12-19	Gandhi
104	Kapil Raj	A	Bean bag	250	2018-12-19	Bhagat
105	Deepshikha Sen	A	Obstacle	350	2018-03-31	Bose
106	Saloni Raj		Egg & Spoon	200	2018-12-20	Bose

(iii) To display House wise total points scored along
with House name (i.e. display the HOUSE and total points scored by each HOUSE)

A) SELECT HOUSE,SUM(POINTS) FROM Activity GROUP BY HOUSE;

b) Consider the following tables SUPPLIER and ITEM and answer the questions that follow:

Table: SUPPLIER

SNo	SName	Area	Email
S01	Quant Computers	East	abc@gmail.com
S02	Superb Media	West	sss@hotmail.com
S03	Media Store	North	
S04	Avon Hardware	North	xyz@gmail.com
S05	AV Tech	South	tmt@hotmail.com

Table : ITEM

INo	IName	Price	SNo
N01	Mother Board	15000	S01
N02	Hard Disk	4000	S01
N03	Keyboard	800	S02
N04	Mouse	300	S01
N05	Mother Board	13000	S02
N06	Key Board	400	S03
N07	Hard Disk	4500	S03

(iii) To display Item Name wise, Minimum and Maximum Price of each item from the table Item.
i.e. display IName ,minimum price and maximum price for each IName.

(OR)

What will be the number of rows in the Cartesian product of the above two tables?

A) SELECT IName, MIN(Price),MAX(Price) FROM Item GROUP BY IName;

(OR)

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WORKING ON EMPLOYEE TABLE
(All types of Queries and Outputs)

Topic 3

Math functions: POWER (), ROUND (), MOD ().

Text functions: UCASE()/UPPER(), LCASE()/ LOWER(),MID()/SUBSTRING()/SUBSTR (), LENGTH(), LEFT (), RIGHT (),INSTR(), LTRIM(), RTRIM (), TRIM ().

Date Functions: NOW (), DATE (), MONTH (), MONTHNAME (), YEAR(), DAY(), DAYNAME ().

Aggregate Functions: MAX(), MIN(), AVG (), SUM(), COUNT (); using COUNT (*).

Let us create a database called CARSHOWROOM, having the schema as shown in Figure 1.1.

It has the following four relations:

• **INVENTORY:** Stores name, price, model, year of manufacturing, and fuel type for each car in inventory of the showroom,

• **CUSTOMER:** Stores customer Id, name, address, phone number and email for each customer,

• **SALE:** Stores the invoice number, car Id, customer id, sale date, mode of payment, sales person's employee Id, and selling price of the car sold,

• **EMPLOYEE:** Stores employee Id, name, date of birth, date of joining, designation, and salary of each employee in the showroom.

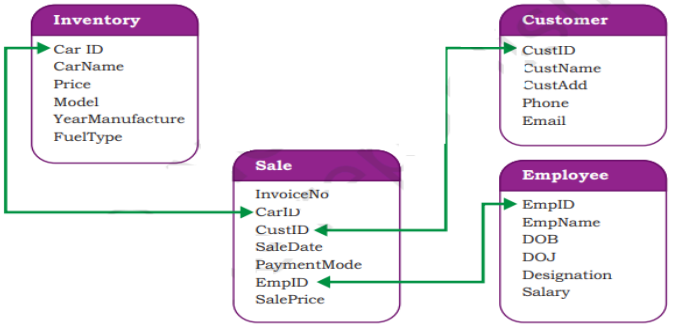


Figure 1.1: Schema diagram of database CARSHOWROOM

The records of the four relations are shown in Tables 1.1, 1.2, 1.3, and 1.4 respectively.

Table 1.1 INVENTORY

mysql> SELECT * FROM INVENTORY;

CarId	CarName	Price	Model	YearManufacture	Fueltype
D001	Car1	582613.00	LXI	2017	Petrol
D002	Car1	673112.00	VXI	2018	Petrol
B001	Car2	567031.00	Sigma1.2	2019	Petrol
B002	Car2	647858.00	Delta1.2	2018	Petrol
E001	Car3	355205.00	5 STR STD	2017	CNG
E002	Car3	654914.00	CARE	2018	CNG
S001	Car4	514000.00	LXI	2017	Petrol
S002	Car4	614000.00	VXI	2018	Petrol

Table 1.3 SALE

mysql> SELECT * FROM SALE;

InvoiceNo	CarId	CustId	SaleDate	PaymentMode	EmpID	SalePrice
I00001	D001	C0001	2019-01-24	Credit Card	E004	613247.00
I00002	S001	C0002	2018-12-12	Online	E001	590321.00
I00003	S002	C0004	2019-01-25	Cheque	E010	604000.00
I00004	D002	C0001	2018-10-15	Bank Finance	E007	659982.00
I00005	E001	C0003	2018-12-20	Credit Card	E002	369310.00
I00006	S002	C0002	2019-01-30	Bank Finance	E007	620214.00

Table 1.4 EMPLOYEE

mysql> SELECT * FROM EMPLOYEE;

EmpID	EmpName	DOB	DOJ	Designation	Salary
E001	Rushil	1994-07-10	2017-12-12	Salesman	25550
E002	Sanjay	1990-03-12	2016-06-05	Salesman	33100
E003	Zohar	1975-08-30	1999-01-08	Peon	20000
E004	Arpit	1989-06-06	2010-12-02	Salesman	39100
E006	Sanjucta	1985-11-03	2012-07-01	Receptionist	27350
E007	Mayank	1993-04-03	2017-01-01	Salesman	27352
E010	Rajkumar	1987-02-26	2013-10-23	Salesman	31111

FUNCTIONS IN SQL

A function is used to perform some particular task and it returns zero or more values as a result.

Functions are useful while writing SQL queries also. Functions can be applied to work on single or multiple records (rows) of a table.

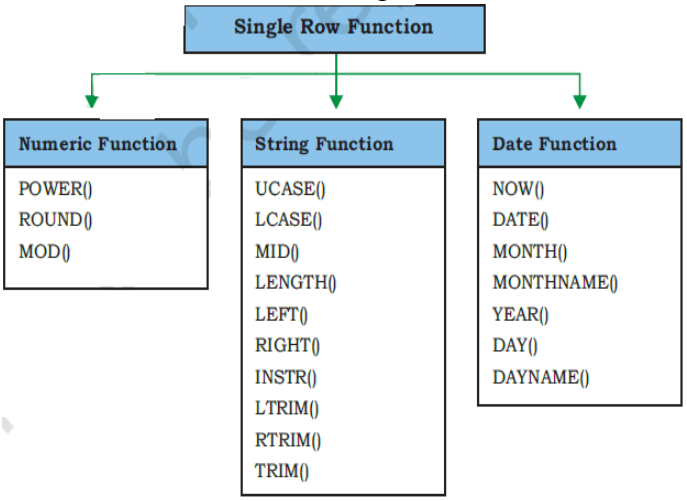
Depending on their application in one or multiple rows, SQL functions are categorised as Single row functions and Aggregate functions.

Single Row Functions (Scalar functions):

Single row functions are applied on a single value and return a single value.

Figure 1.2 lists different single row functions under three categories — Numeric (Math), String, Date and Time.

Math functions accept numeric value as input, and return a numeric value as a result. **String functions** accept character value as input, and return either character or numeric values as output. **Date and time functions** accept date and time values as input, and return numeric or string, or date and time values as output.



(A) NUMERIC FUNCTIONS

Three commonly used numeric functions are POWER(), ROUND() and MOD(). Their usage along with syntax is given in Table 1.5.

Table 1.5 Math Functions

Function	Description	Example with output
POWER(X,Y) can also be written as POW(X,Y)	Calculates X to the power Y.	mysql> SELECT POWER(2,3); Output: 8
ROUND(N,D)	Rounds off number N to D number of decimal places. Note: If D=0, then it rounds off the number to the nearest integer.	mysql>SELECT ROUND(2912.564, 1); Output: 2912.6 mysql>SELECT ROUND(283.2); Output: 283
MOD(A, B)	Returns the remainder after dividing number A by number B.	mysql>SELECT MOD(21, 2); Output: 1

Example 1.1 :

In order to increase sales, suppose the car dealer decides to offer his customers to pay the total amount in 10 easy EMIs (equal monthly installments). Assume that EMIs are required to be in multiples of 10,000. For that, the dealer wants to list the CarID and Price along with the following data from the Inventory table:

a) Calculate GST as 12% of Price and display the result after rounding it off to one decimal place.

```
mysql> SELECT ROUND(12/100*Price,1) "GST"
       FROM INVENTORY;
```

GST

69913.6
80773.4
68043.7
77743.0
42624.6
78589.7
61680.0
73680.0

b) Add a new column FinalPrice to the table inventory, which will have the value as sum of Price and 12% of the GST.

```
mysql> ALTER TABLE INVENTORY ADD FinalPrice Numeric(10,1);

Query OK, 8 rows affected (0.03 sec)
Records: 8 Duplicates: 0 Warnings: 0

mysql> UPDATE INVENTORY SET
       FinalPrice=Price+Round(Price*12/100,1);

Query OK, 8 rows affected (0.01 sec)
Rows matched: 8 Changed: 8 Warnings: 0

mysql> SELECT * FROM INVENTORY;
```

CarId	CarName	Price	Model	YearManufacture	FuelType	FinalPric
D001	Car1	582613.00	LXI	2017	Petrol	652526.6
D002	Car1	673112.00	VXI	2018	Petrol	753885.4
B001	Car2	567031.00	Sigma1.2	2019	Petrol	635074.7
B002	Car2	647858.00	Delta1.2	2018	Petrol	725601.0
E001	Car3	355205.00	SSTR STD	2017	CNG	397829.6
E002	Car3	654914.00	CARE	2018	CNG	733503.7
S001	Car4	514000.00	LXI	2017	Petrol	575680.0
S002	Car4	614000.00	VXI	2018	Petrol	687680.0

c) Calculate and display the amount to be paid each month (in multiples of 1000) which is to be calculated after dividing the FinalPrice of the car into 10 instalments.

d) After dividing the amount into EMIs, find out the remaining amount to be paid immediately, by performing modular division.

Following SQL query can be used to solve the above mentioned problems:

```
mysql> select CarId, FinalPrice, ROUND((FinalPrice-
MOD(FinalPrice,10000))/10,0)"EMI",
MOD(FinalPrice,10000) "Remaining Amount"
FROM INVENTORY;
```

CarId	FinalPrice	EMI	Remaining Amount
D001	652526.6	65000	2526.6
D002	753885.4	75000	3885.4
B001	635074.7	63000	5074.7
B002	725601.0	72000	5601.0
E001	397829.6	39000	7829.6
E002	733503.7	73000	3503.7
S001	575680.0	57000	5680.0
S002	687680.0	68000	7680.0

Example 1.2:

a) Let us now add a new column Commission to the SALE table. The column Commission should have a total length of 7 in which 2 decimal places to be there.

```
mysql> ALTER TABLE SALE ADD(Commission
Numeric(7,2));
Query OK, 6 rows affected (0.34 sec)
Records: 6 Duplicates: 0 Warnings: 0
```

b) Let us now calculate commission for sales agents as 12 per cent of the SalePrice, insert the values to the newly added column Commission and then display records of the table SALE where commission> 73000.

```
mysql> UPDATE SALE SET
Commission=12/100*SalePrice;
Query OK, 6 rows affected (0.06 sec)
Rows matched: 6 Changed: 6 Warnings: 0
mysql> SELECT * FROM SALE WHERE
Commission > 73000;
```

invoiceno	carid	custid	saledate	paymentmode	empid	saleprice	Commissio
I00001	D001	C0001	2019-01-24	Credit Card	E004	613247.00	73589.64
I0000	D002	C0001	2018-10-15	Bank Finance	E007	659982.00	79197.84
I00006	S002	C0002	2019-01-30	Bank Finance	E007	620214.00	74425.68

c) Display InvoiceNo, SalePrice and Commission such that commission value is rounded off to 0.

```
mysql> SELECT InvoiceNo, SalePrice,
Round(Commission,0) FROM SALE;
```

InvoiceNo	SalePrice	Round(Commission,0)
I00001	613247.00	73590
I00002	590321.00	70839
I00003	604000.00	72480
I00004	659982.00	79198
I00005	369310.00	44317
I00006	620214.00	74426

NUMERIC FUNCTIONS

(1) SELECT MOD(11,3);

```
mysql> SELECT MOD(11,3);
+-----------+
| MOD(11,3) |
+-----------+
|         2 |
+-----------+
```

(2) SELECT 11%3;

```
mysql> SELECT 11%3;
+------+
| 11%3 |
+------+
|    2 |
+------+
```

(3) SELECT 11 MOD 3;

```
mysql> SELECT 11 MOD 3;
+----------+
| 11 MOD 3 |
+----------+
|        2 |
+----------+
```

(4) SELECT POWER(4,3);

```
mysql> SELECT POWER(4,3);
+------------+
| POWER(4,3) |
+------------+
|         64 |
+------------+
```

(5) SELECT POW(SNO,3) FROM Peripherals;

```
mysql> SELECT POW(SNO,3)
    -> FROM Peripherals;
+------------+
| POW(SNO,3) |
+------------+
|          1 |
|          8 |
|         27 |
|         64 |
+------------+
```

(6) SELECT POWER(3.1,2.2);

```
mysql> SELECT POWER(3.1,2.2);
+--------------------+
| POWER(3.1,2.2)     |
+--------------------+
| 12.050240825798763 |
+--------------------+
```

(7) SELECT ROUND(876.2345,-2);

```
mysql> SELECT ROUND(876.2345,-2);
+--------------------+
| ROUND(876.2345,-2) |
+--------------------+
|                900 |
+--------------------+
```

(8) SELECT ROUND(876.2345,2);

```
mysql> SELECT ROUND(876.2345,2);
+-------------------+
| ROUND(876.2345,2) |
+-------------------+
|            876.23 |
+-------------------+
```

(9) SELECT ROUND(234,0);

```
mysql> SELECT ROUND(234,0);
+--------------+
| ROUND(234,0) |
+--------------+
|          234 |
+--------------+
```

(10) SELECT ROUND(234.76767,0);

```
mysql> SELECT ROUND(234.76767,0);
+--------------------+
| ROUND(234.76767,0) |
+--------------------+
|                235 |
+--------------------+
```

(11) SELECT TRUNCATE(7373212.12854,2);

```
mysql> SELECT TRUNCATE(7373212.12854,2);
+---------------------------+
| TRUNCATE(7373212.12854,2) |
+---------------------------+
|                7373212.12 |
+---------------------------+
```

(12) SELECT TRUNCATE(7373212.12854,-2);

```
mysql> SELECT TRUNCATE(7373212.12854,-2);
+----------------------------+
| TRUNCATE(7373212.12854,-2) |
+----------------------------+
|                 7373200 |
+----------------------------+
```

(B) STRING FUNCTIONS

String functions can perform various operations on alphanumeric data which are stored in a table. They can be used to change the case (uppercase to lowercase or vice-versa), extract a substring, calculate the length of a string and so on. String functions and their usage are shown in Table 1.6.

Table 1.6 String Functions

Function	Description	Example with output
UCASE(string) OR **UPPER**(string)	Converts string into uppercase.	mysql> SELECT UCASE("Informatics Practices"); Output: INFORMATICS PRACTICES
LOWER(string) OR **LCASE**(string)	Converts string into lowercase.	mysql> SELECT LOWER("Informatics Practices"); Output: informatics practices
MID (string, pos, n) OR **SUBSTRING**(string,pos, n) OR **SUBSTR**(string, pos, n)	Returns a substring of size n starting from the specified position (pos) of the string. If n is not specified, it returns the substring from the position pos till end of the string.	mysql> SELECT MID("Informatics", 3, 4); Output: form mysql> SELECT MID('Informatics',7); Output: atics
LENGTH(string)	Return the number of characters in the specified string.	mysql> SELECT LENGTH("Informatics"); Output: 11
LEFT(string, N)	Returns N number of characters from the left side of the string.	mysql> SELECT LEFT("Computer", 4); Output: Comp
RIGHT(string, N)	Returns N number of characters from the right side of the string.	mysql> SELECT RIGHT("SCIENCE", 3); Output: NCE
INSTR(string, substring)	Returns the position of the first occurrence of the substring in the given string. Returns 0, if the substring is not present in the string.	mysql> SELECT INSTR("Informatics", "ma"); Output: 6
LTRIM(string)	Returns the given string after removing leading white space characters.	mysql> SELECT LENGTH(" DELHI"), LENGTH(LTRIM(" DELHI")); Output: +--------+ | 7 | 5 | +--------+ 1 row in set (0.00 sec)

RTRIM(string)	Returns the given string after removing trailing white space characters.	mysql>SELECT LENGTH("PEN ") LENGTH(RTRIM("PEN ")); Output: +--------+ | 5 | 3 | +--------+ 1 row in set (0.00 sec)
TRIM(string)	Returns the given string after removing both leading and trailing white space characters.	mysql> SELECT LENGTH(" MADAM "),LENGTH(TRIM(" MADAM ")); Output: +--------+ | 9 | 5 | +--------+ 1 row in set (0.00 sec)

Example 1.3

Let us use CUSTOMER relation shown in Table 1.2 to understand the working of string functions.

a) Display customer name in lower case and customer email in upper case from table CUSTOMER.

mysql> SELECT LOWER(CustName), UPPER(Email) FROM CUSTOMER;

LOWER (CustName)	UPPER(Email)
amitsaha	AMITSAHA2@GMAIL.COM
rehnuma	REHNUMA@HOTMAIL.COM
charvinayyar	CHARVI123@YAHOO.COM
gurpreet	GUR_SINGH@YAHOO.COM

4 rows in set (0.00 sec)

b) Display the length of the email and part of the email from the email ID before the character '@'. Note – Do not print '@'.

mysql> SELECT LENGTH(Email), LEFT(Email, INSTR(Email, "@")-1) FROM CUSTOMER;

LENGTH(Email)	LEFT(Email, INSTR(Email, "@")-1)
19	amitsaha2
19	rehnuma
19	charvi123
19	gur_singh

4 rows in set (0.03 sec)

The function INSTR will return the position of "@" in the email address. So to print email id without "@" we have to use position -1.

Activity 1.1: Using the table SALE of CARSHOWROOM database, write SQL queries for the following:

a) Display the InvoiceNo and commission value rounded off to zero decimal places.

b) Display the details of SALE where payment mode is credit card.

Activity 1.2 : Using the table INVENTORY from CARSHOWROOM database, write sql queries for the following:

a) Convert the CarMake to uppercase if its value starts with the letter 'B'.

b) If the length of the car's model is greater than 4 then fetch the substring starting from position 3 till the end from attribute Model.

c) Let us assume that four digit area code is reflected in the mobile number starting from position number3. For example, 2630 is the area code of mobile number 4726309212. Now, write the SQL query to display the area code of the customer living in Rohini.

mysql> SELECT MID(Phone,3,4) FROM CUSTOMER WHERE CustAdd like '%Rohini%';

MID(Phone,3,4)
1163
1 row in set (0.00 sec)

d) Display emails after removing the domain name extension ".com" from emails of the customers.

mysql> SELECT TRIM(".com" from Email) FROM CUSTOMER;

TRIM(".com" FROM Email)
amitsaha2@gmail
rehnuma@hotmail
charvi123@yahoo
gur_singh@yahoo
rows in set (0.00 sec)

e) Display details of all the customers having yahoo emails only.

mysql> SELECT * FROM CUSTOMER WHERE Email LIKE "%yahoo%";

CustID	CustName	CustAdd	Phone	Email
C0003	CharviNayyar	10/9, FF, Rohini	6811635425	charvi123@yahoo.com
C0004	Gurpreet	A-10/2,SF, MayurVihar	3511056125	gur_singh@yahoo.com

2 rows in set (0.00 sec)t

SQL FUNCTIONS :: PRACTICE BITS

Sample Table: **Peripherals**

SNo	PName	Cost
1	Keyboard	730
2	Mouse	325
3	Projector	45000
4	Monitor	5600

Write the output

A.TEXT/STRING FUNCTIONS

(1) SELECT LOWER("My Name is ");

```
mysql> SELECT LOWER("My Name is ");
+----------------------+
| LOWER("My Name is ") |
+----------------------+
| my name is           |
+----------------------+
```

(2) SELECT LCASE(PName) from Peripherals;

```
mysql> SELECT LCASE(PName) from Peripherals;
+--------------+
| LCASE(PName) |
+--------------+
| keyboard     |
| mouse        |
| projector    |
| monitor      |
+--------------+
```

(3) SELECT UPPER("Welcome Dude");

```
mysql> SELECT UPPER("Welcome Dude");
+------------------------+
| UPPER("Welcome Dude") |
+------------------------+
| WELCOME DUDE           |
+------------------------+
```

(4) SELECT UCASE(PName) from Peripherals;

```
mysql> SELECT UCASE(PName) from Peripherals;
+--------------+
| UCASE(PName) |
+--------------+
| KEYBOARD     |
| MOUSE        |
| PROJECTOR    |
| MONITOR      |
+--------------+
```

(5) SELECT SUBSTR('BHIMAVARAM',2,5);

```
mysql> SELECT SUBSTR('BHIMAVARAM',2,5);
+---------------------------+
| SUBSTR('BHIMAVARAM',2,5) |
+---------------------------+
| HIMAV                     |
+---------------------------+
1 row in set (0.00 sec)
```

(6) SELECT SUBSTR('HYDERABAD',-7,4);

```
mysql> SELECT SUBSTR('HYDERABAD',-7,4);
+---------------------------+
| SUBSTR('HYDERABAD',-7,4) |
+---------------------------+
| DERA                      |
+---------------------------+
```

(7) SELECT SUBSTR(PNAME,2,3) FROM Peripherals WHERE SNo>=2;

```
mysql> SELECT SUBSTR(PNAME,2,3)
    -> FROM Peripherals WHERE SNo>=2;
+--------------------+
| SUBSTR(PNAME,2,3) |
+--------------------+
| ous                |
| roj                |
| oni                |
+--------------------+
```

(8) SELECT LTRIM(‘ Bhimavaram ‘);

```
mysql> SELECT LTRIM('    Bhimavaram    ');
+-----------------------------+
| LTRIM('    Bhimavaram    ') |
+-----------------------------+
| Bhimavaram                  |
+-----------------------------+
```

(9) SELECT RTRIM(‘ Bhimavaram ‘);

```
mysql> SELECT RTRIM('    Bhimavaram    ');
+-----------------------------+
| RTRIM('    Bhimavaram    ') |
+-----------------------------+
|     Bhimavaram              |
+-----------------------------+
```

(10) SELECT TRIM(‘ Bhimavaram ‘);

```
mysql> SELECT TRIM('    Bhimavaram    ');
+-----------------------------+
| TRIM('    Bhimavaram    ') |
+-----------------------------+
| Bhimavaram                  |
+-----------------------------+
```

(11) SELECT TRIM(LEADING ‘ ‘ FROM ‘ Bhimavaram ‘);

```
mysql> SELECT TRIM(LEADING  ' ' FROM '    Bhimavaram    ');
+-----------------------------------------------+
| TRIM(LEADING  ' ' FROM '    Bhimavaram    ') |
+-----------------------------------------------+
| Bhimavaram                                    |
+-----------------------------------------------+
```

(12) SELECT TRIM(TRAILING ‘ ‘ FROM ‘ Bhimavaram ‘);

```
mysql> SELECT TRIM(TRAILING  ' ' FROM '    Bhimavaram    ');
+-----------------------------------------------+
| TRIM(TRAILING  ' ' FROM '    Bhimavaram    ') |
+-----------------------------------------------+
|     Bhimavaram                                |
+-----------------------------------------------+
```

(13) SELECT TRIM(BOTH ‘M’ FROM ‘MMMMMAMARAVATHIMMMMMM’) AS “TRIM”;

```
+-----------+
| LTRIM     |
+-----------+
| AMARAVATHI |
+-----------+
```

(14) SELECT TRIM(LEADING ‘M’ FROM ‘MMMMMAMARAVATHIMMMMMM’) AS “LTRIM”;

```
+------------------+
| LTRIM            |
+------------------+
| AMARAVATHIMMMMM |
+------------------+
```

(15) SELECT TRIM(TRAILING ‘M’ FROM ‘MMMMMAMARAVATHIMMMMMM’) AS “RTRIM”;

```
+-----------------+
| LTRIM           |
+-----------------+
| MMMMMAMARAVATHI |
+-----------------+
```

(16) SELECT INSTR('AUTOMATIC TELLER MACHINE','MA') AS "ATM";

```
+-----+
| ATM |
+-----+
|   5 |
+-----+
```

(17) SELECT PName,INSTR(Pname,'Mo') AS "Test Instr" FROM Peripherals;

```
mysql> SELECT PName,INSTR(Pname,'Mo') AS
    -> "Test Instr" FROM Peripherals;
+-----------+------------+
| PName     | Test Instr |
+-----------+------------+
| Keyboard  |          0 |
| Mouse     |          1 |
| Projector |          0 |
| Monitor   |          1 |
+-----------+------------+
```

(18) SELECT LENGTH('Bhimavaram');

```
mysql> SELECT LENGTH('Bhimavaram');
+----------------------+
| LENGTH('Bhimavaram') |
+----------------------+
|                   10 |
+----------------------+
```

(19) SELECT LENGTH(Akiveedu);

```
mysql> SELECT LENGTH('Akiveedu');
+--------------------+
| LENGTH('Akiveedu') |
+--------------------+
|                  8 |
+--------------------+
```

(20) SELECT LENGTH(86954);

```
mysql> SELECT LENGTH(86954);
+---------------+
| LENGTH(86954) |
+---------------+
|             5 |
+---------------+
```

(21) SELECT LENGTH(7894.11123);

```
mysql> SELECT LENGTH(7894.11123);
+--------------------+
| LENGTH(7894.11123) |
+--------------------+
|                 10 |
+--------------------+
```

(22) SELECT PName, LENGTH(Pname) FROM Peripherals;

```
mysql> SELECT PName, LENGTH(Pname)
    -> FROM Peripherals;
+-----------+---------------+
| PName     | LENGTH(Pname) |
+-----------+---------------+
| Keyboard  |             8 |
| Mouse     |             5 |
| Projector |             9 |
| Monitor   |             7 |
+-----------+---------------+
```

(23) SELECT LEFT ("Hiroshima",4);

```
mysql> SELECT LEFT('Hiroshima',4);
+--------------------+
| LEFT('Hiroshima',4) |
+--------------------+
| Hiro               |
+--------------------+
```

(24) SELECT RIGHT("Hiroshima",3);

```
mysql> SELECT RIGHT('Hiroshima',3);
+---------------------+
| RIGHT('Hiroshima',3) |
+---------------------+
| ima                 |
+---------------------+
```

(29) SELECT MID("Hiroshima",2,5);

```
mysql> SELECT MID('Hiroshima',2,5);
+---------------------+
| MID('Hiroshima',2,5) |
+---------------------+
| irosh               |
+---------------------+
```

(C) DATE AND TIME FUNCTIONS

There are various functions that are used to perform operations on date and time data. Some of the operations include displaying the current date, extracting each element of a date (day, month and year), displaying day of the week and so on. Table 1.7 explains various date and time functions.

Table 1.7 Date Functions

Function	Description	Example with output
NOW()	It returns the current system date and time.	mysql> SELECT NOW(); **Output:** 2019-07-11 19:41:17
DATE()	It returns the date part from the given date/ time expression.	mysql> SELECT DATE(NOW()); **Output:** 2019-07-11
MONTH(date)	It returns the month in numeric form from the date.	mysql> SELECT MONTH(NOW()); **Output:** 7
MONTHNAME (date)	It returns the month name from the specified date.	mysql> SELECT MONTHNAME("2003-11-28"); **Output:** November
YEAR(date)	It returns the year from the date.	mysql> SELECT YEAR("2003-10-03"); **Output:** 2003
DAY(date)	It returns the day part from the date.	mysql> SELECT DAY("2003-03-24"); **Output:** 24
DAYNAME(date)	It returns the name of the day from the date.	mysql> SELECT DAYNAME("2019-07-11"); **Output:**

		Thursday

Example 1.4

Let us use the EMPLOYEE table of CARSHOWROOM database to illustrate the working of some of the date and time functions.

a) Select the day, month number and year of joining of all employees.

mysql> SELECT DAY(DOJ), MONTH(DOJ), YEAR(DOJ) FROM EMPLOYEE;

```
+----------+-----------+----------+
| DAY(DOJ) | MONTH(DOJ) | YEAR(DOJ) |
+----------+-----------+----------+
|       12 |         12 |      2017 |
|        5 |          6 |      2016 |
|        8 |          1 |      1999 |
|        2 |         12 |      2010 |
|        1 |          7 |      2012 |
|        1 |          1 |      2017 |
|       23 |         10 |      2013 |
+----------+-----------+----------+
```

b) If the date of joining is not a Sunday, then display it in the following format "Wednesday, 26, November, 1979."

mysql> SELECT DAYNAME(DOJ), DAY(DOJ), MONTHNAME(DOJ), YEAR(DOJ) FROM EMPLOYEE WHERE DAYNAME(DOJ)!='Sunday';

```
+------------+---------+---------------+---------+
|DAYNAME(DOJ)| DAY(DOJ)|MONTHNAME(DOJ) |YEAR(DOJ)|
+------------+---------+---------------+---------+
|Tuesday     |      12 | December      |    2017 |
|Friday      |       8 | January       |    1999 |
|Thursday    |       2 | December      |    2010 |
|Wednesday   |      23 | October       |    2013 |
+------------+---------+---------------+---------+
```

4 rows in set (0.00 sec)

C.DATE/TIME FUNCTIONS

(1) SELECT NOW();

```
mysql> SELECT NOW();
+---------------------+
| NOW()               |
+---------------------+
| 2022-09-13 13:41:25 |
+---------------------+
```

(2) SELECT DATE('2022-12-25 1:12:23');

```
mysql> SELECT DATE('2022-12-25 1:12:23');
+----------------------------+
| DATE('2022-12-25 1:12:23') |
+----------------------------+
| 2022-12-25                 |
+----------------------------+
```

(3) SELECT DATE('TEST 2022-12-25');

```
mysql> SELECT DATE('TEST 2022-12-25');
+--------------------------+
| DATE('TEST 2022-12-25') |
+--------------------------+
| NULL                     |
+--------------------------+
```

(4) SELECT DATE('2022-12-25 TEST');

```
mysql> SELECT DATE('2022-12-25 TEST');
+--------------------------+
| DATE('2022-12-25 TEST') |
+--------------------------+
| 2022-12-25               |
+--------------------------+
```

(5) SELECT MONTH('2020-05-22');

```
mysql> SELECT MONTH('2020-05-22');
+---------------------+
| MONTH('2020-05-22') |
+---------------------+
|                   5 |
+---------------------+
```

(6) SELECT MONTH('2022-14-22');

```
mysql> SELECT MONTH('2022-14-22');
+---------------------+
| MONTH('2022-14-22') |
+---------------------+
|                NULL |
+---------------------+
```

(7) SELECT MONTH('2022-05-22 TESTING');

```
mysql> SELECT MONTH('2022-05-22 TESTING');
+-----------------------------+
| MONTH('2022-05-22 TESTING') |
+-----------------------------+
|                           5 |
+-----------------------------+
```

(8) SELECT MONTH('TESTING 2022-05-22');

```
mysql> SELECT MONTH('TESTING 2022-05-22');
+-----------------------------+
| MONTH('TESTING 2022-05-22') |
+-----------------------------+
|                        NULL |
+-----------------------------+
```

(9) SELECT MONTHNAME('1981-04-02');

```
mysql> SELECT MONTHNAME('1981-04-02');
+-------------------------+
| MONTHNAME('1981-04-02') |
+-------------------------+
| April                   |
+-------------------------+
```

(10) SELECT MONTHNAME('1981-4-02');

```
mysql> SELECT MONTHNAME('1981-4-02');
+-------------------------+
| MONTHNAME('1981-4-02') |
+-------------------------+
| April                   |
+-------------------------+
```

(11)SELECT MONTHNAME('WBB 1981-04-02');

```
mysql> SELECT MONTHNAME('WBB 1981-04-02');
+-----------------------------+
| MONTHNAME('WBB 1981-04-02') |
+-----------------------------+
| NULL                        |
+-----------------------------+
```

(12) SELECT MONTHNAME('1981-04-02 WBB');

```
mysql> SELECT MONTHNAME('1981-04-02 WBB');
+----------------------------+
| MONTHNAME('1981-04-02 WBB') |
+----------------------------+
| April                      |
+----------------------------+
```

(13) SELECT YEAR('2012-05-25');

```
mysql> SELECT YEAR('2012-05-25');
+--------------------+
| YEAR('2012-05-25') |
+--------------------+
|               2012 |
+--------------------+
```

(14) SELECT YEAR('-3002-03-24');

```
mysql> SELECT YEAR('-3002-03-24');
+---------------------+
| YEAR('-3002-03-24') |
+---------------------+
|                NULL |
+---------------------+
```

(15) SELECT DAY('2015-06-26');

```
mysql> SELECT DAY('2015-06-26');
+-------------------+
| DAY('2015-06-26') |
+-------------------+
|                26 |
+-------------------+
```

(16) SELECT DAY('2015-06-36');

```
mysql> SELECT DAY('2015-06-36');
+-------------------+
| DAY('2015-06-36') |
+-------------------+
|              NULL |
+-------------------+
```

(17) SELECT DAY('WBB 2015-06-15');

```
mysql> SELECT DAY('WBB 2015-06-15');
+-----------------------+
| DAY('WBB 2015-06-15') |
+-----------------------+
|                  NULL |
+-----------------------+
```

(18) SELECT DAY('2015-06-15 WBB');

```
mysql> SELECT DAY('2015-06-15 WBB');
+-----------------------+
| DAY('2015-06-15 WBB') |
+-----------------------+
|                    15 |
+-----------------------+
```

(19) SELECT DAYNAME('2022-09-13');

```
mysql> SELECT DAYNAME('2022-09-13');
+-------------------------+
| DAYNAME('2022-09-13') |
+-------------------------+
| Tuesday                 |
+-------------------------+
```

(20) Write a query to display the date after 25 days of current date on your system.

```
mysql> SELECT CURDATE()+25;
+--------------+
| CURDATE()+25 |
+--------------+
|     20220938 |
+--------------+
```

(21) SELECT CURDATE() + 15;

```
mysql> SELECT CURDATE() + 15;
+----------------+
| CURDATE() + 15 |
+----------------+
|       20220928 |
+----------------+
```

Activity 1.4: Using the table EMPLOYEE of CARSHOWROOM database, list the day of birth for all employees whose salary is more than 25000.

Think and Reflect : Can we use arithmetic operators (+, -. *, or /) on date functions?

1.2.2 Aggregate Functions:

Aggregate functions are also called multiple row functions.

These functions work on a set of records as a whole, and return a single value for each column of the records on which the function is applied. Table 1.8 shows the differences between single row functions and multiple row functions. Table 1.9 describes some of the aggregate functions along with their usage. Note that column must be of numeric type.

Table 1.8 Differences between Single row and Multiple row Functions

Single row Functions	Multiple row functions
1. It operates on a single row at a time.	1. It operates on groups of rows.
2. It returns one result per row.	2. It returns one result for a group of rows.
3. It can be used in Select, Where, and Order by clause.	3. It can be used in the select clause only.
4. Math, String and Date functions are examples of single row functions.	4. Max(), Min(), Avg(), Sum(), Count() and Count(*) are examples of multiple row functions.

Table 1.9 Aggregate Functions in SQL

Function	Description	Example with output
MAX (column)	Returns the largest value from the specified column.	mysql> SELECT MAX(Price) FROM INVENTORY; Output: 673112.00

MIN (column)	Returns the smallest value from the specified column.	mysql> SELECT MIN(Price) FROM INVENTORY; Output: 355205.00
AVG (column)	Returns the average of the values in the specified column.	mysql> SELECT AVG(Price) FROM INVENTORY; Output: 576091.625000
SUM (column)	Returns the sum of the values for the specified column.	mysql> SELECT SUM(Price) FROM INVENTORY; Output: 4608733.00
COUNT (column)	Returns the number of values in the specified column ignoring the NULL values. Note: In this example, let us consider a MANAGER table having two attributes and four records.	mysql> SELECT * from MANAGER; Output: +------+---------+ | MNO | MEMNAME | +------+---------+ | 1 | AMIT | | 2 | KAVREET | | 3 | KAVITA | | 4 | NULL | +------+---------+ rows in set (0.00 sec) mysql> SELECT COUNT(MEMNAME) FROM MANAGER; Output: +----------------+ | COUNT(MEMNAME) | +----------------+ | 3 | +----------------+ 1 row in set (0.01 sec)
COUNT(*)	Returns the number of records in a table. Note: In order to display the number of records that matches a particular criteria in the table, we have to use COUNT(*) with WHERE clause.	mysql> SELECT COUNT(*) from MANAGER; Output: +----------+ | count(*) | +----------+ | 4 | +----------+ 1 row in set (0.00 sec)

Example 1.5

a) Display the total number of records from table INVENTORY having a model as VXI.

mysql> SELECT COUNT(*) FROM INVENTORY WHERE Model="VXI";

```
+----------+
| COUNT(*) |
+----------+
|        2 |
+----------+
```

b) Display the total number of different types of Models available from table INVENTORY.

mysql> SELECT COUNT(DISTINCT Model) FROM INVENTORY;

```
+----------------------+
| COUNT(DISTINCT MODEL) |
+----------------------+
|                    6 |
+----------------------+
```

c) Display the average price of all the cars with Model LXI from table INVENTORY.

mysql> SELECT AVG(Price) FROM INVENTORY WHERE Model="LXI";

```
+---------------+
| AVG(Price)    |
+---------------+
| 548306.500000 |
+---------------+
```

Sample Table: **Peripherals**

SNo	PName	Cost
1	Keyboard	730
2	Mouse	325
3	Projector	45000
4	Monitor	5600

```
mysql> SELECT MAX(COST) FROM PERIPHERALS;
+-----------+
| MAX(COST) |
+-----------+
|     45000 |
+-----------+
```

```
mysql> SELECT MIN(COST) FROM PERIPHERALS;
+-----------+
| MIN(COST) |
+-----------+
|       325 |
+-----------+
```

```
mysql> select Avg(Cost) from Peripherals;
+------------+
| Avg(Cost)  |
+------------+
| 12913.7500 |
+------------+
```

```
mysql> SELECT SUM(COST) FROM PERIPHERALS;
+-----------+
| SUM(COST) |
+-----------+
|     51655 |
+-----------+
```

```
mysql> SELECT COUNT(PNAME) FROM PERIPHERALS;
+--------------+
| COUNT(PNAME) |
+--------------+
|            4 |
+--------------+
```

Assume, one more record is added to the peripherals table: ie 5, **NULL**, 2000

```
mysql> SELECT * FROM PERIPHERALS;
+------+-----------+-------+
| SNO  | PNAME     | COST  |
+------+-----------+-------+
|    1 | Keyboard  |   730 |
|    2 | Mouse     |   325 |
|    3 | Projector | 45000 |
|    4 | Monitor   |  5600 |
|    5 | NULL      |  2000 |
+------+-----------+-------+
```

Count : Returns the number of values in the specified column ignoring the NULL values.
So Count(PNAME) will produce 4
Count(SNo) will product 5.

```
mysql> SELECT COUNT(PNAME) FROM PERIPHERALS;
+--------------+
| COUNT(PNAME) |
+--------------+
|            4 |
+--------------+
```

```
mysql> SELECT COUNT(SNO) FROM PERIPHERALS;
+------------+
| COUNT(SNO) |
+------------+
|          5 |
+------------+
```

```
mysql> SELECT COUNT(*) FROM PERIPHERALS;
+----------+
| COUNT(*) |
+----------+
|        5 |
+----------+
```

Count(*) : Returns the number of records in a table.

CBSE QUESTIONS – MCQs

CBSE QUESTIONS – QUESTIONS

5. Match the following SQL functions/clauses with their descriptions:

SQL Function		Description	
P.	MAX()	1.	Find the position of a substring in a string.
Q.	SUBSTRING()	2.	Returns the maximum value in a column.
R.	INSTR()	3.	Sorts the data based on a column.
S.	ORDER BY	4.	Extracts a portion of a string.

(A) P-2, Q-4, R-3, S-1
(B) P-2, Q-4, R-1, S-3
(C) P-4, Q-3, R-2, S-1
(D) P-4, Q-2, R-1, S-3

A) (B). P-2, Q-4, R-1, S-3

24. Consider the string: "Database Management System". Write suitable SQL queries for the following:
I. To extract and display "Manage" from the string.
II. Display the position of the first occurrence of "base" in the given string.
A) I. SELECT SUBSTRING('Database Management System', 10, 6);
II. SELECT INSTR('Database Management System', 'base');

32. B) Consider the following table:
ATHLETE, which stores AthleteID, Name, Country. The table displays basic information of the athletes
Table: ATHLETE

AthleteID	Name	COUNTRY
101	Arjun	INDIA
102	Priya	INDIA
103	Asif	UAE
104	Rozy	USA
105	David	DENMARK

A) Write appropriate SQL queries for the following:
II. Display the names of all the Indian athletes in uppercase.
A)
II. SELECT UPPER(Name) FROM ATHLETE WHERE COUNTRY = 'INDIA';

34.A) Rahul, who works as a database designer, has developed a database for a bookshop. This database includes a table BOOK whose column (attribute) names are mentioned below:
BCODE: Shows the unique code for each book.
TITLE: Indicates the book's title.
AUTHOR: Specifies the author's name.
PRICE: Lists the cost of the book.
Table: BOOK

BCODE	TITLE	AUTHOR	PRICE
B001	MIDNIGHT'S CHILDREN	SALMAN RUSHDIE	500
B002	THE GOD OF SMALL THINGS	ARUNDHATI ROY	450
B003	A SUITABLE BOY	VIKRAM SETH	600
B004	THE WHITE TIGER	ARAVIND ADIGA	399
B005	TRAIN TO PAKISTAN	KHUSHWANT SINGH	350

I. Write SQL query to display book titles in lowercase.
II. Write SQL query to display the highest price among the books.
III. Write SQL query to display the number of characters in each book title.
A) I. SELECT LOWER(TITLE) FROM BOOK;
II. SELECT MAX(PRICE) FROM BOOK;
III. SELECT LENGTH(TITLE) FROM BOOK;

34.B) Dr. Kavita has created a database for a hospital's pharmacy. The database includes a table named MEDICINE whose column (attribute) names are mentioned below:
MID: Shows the unique code for each medicine.
MED_NAME: Specifies the medicine name
SUPP_CITY: Specifies the city where the supplier is located.
STOCK: Indicates the quantity of medicine available.
DEL_DATE: Specifies the date when the medicine was delivered.
Table: MEDICINE

MID	MED_NAME	SUPP_CITY	STOCK	DEL_DATE
M01	PARACETAMOL	MUMBAI	200	2023-06-15
M02	AMOXICILLIN	KOLKATA	50	2023-03-21
M03	COUGH SYRUP	BENGALURU	120	2023-02-10
M04	INSULIN	CHENNAI	135	2023-01-25
M05	IBUPROFEN	AHMEDABAD	30	2023-04-05

Write the output of the following SQL Queries.
I. Select LENGTH(MED_NAME) from MEDICINE where STOCK > 100;
II. Select MED_NAME from MEDICINE where month(DEL_DATE) = 4;
IV. Select max(DEL_DATE) from MEDICINE;
A) i.

LENGTH(MED_NAME)
11
11
7

ii.

MED_NAME
IBUPROFEN

iv.

max(DEL_DATE)
2023-06-15

37.A)
Write suitable SQL query for the following:
I. To display the average score from the test_results column (attribute) in the Exams table
II. To display the last three characters of the registration_number column (attribute) in the Vehicles table. (Note: The registration numbers are stored in the format DL-01-AV-1234)
III. To display the data from the column (attribute) username in the Users table, after eliminating any leading and trailing spaces.
IV. To display the maximum value in the salary column (attribute) of the Employees table.
V. To determine the count of rows in the Suppliers table.
A)
I. SELECT AVG(test_results) FROM Exams;
II. SELECT RIGHT(registration_number, 3) FROM Vehicles;
III. SELECT TRIM(username) FROM Users;
IV. SELECT MAX(salary) FROM Employees;
V. SELECT COUNT(*) FROM Suppliers;

37.B) Write suitable SQL query for the following:
I. Round the value of pi (3.14159) to two decimal places.
II. Calculate the remainder when 125 is divided by 8.
III. Display the number of characters in the word 'NewDelhi'.
IV. Display the first 5 characters from the word 'Informatics Practices'.
V. Display details from 'email' column (attribute), in the 'Students' table, after removing any leading and trailing spaces.

A) I. SELECT ROUND(3.14159, 2);
II. SELECT MOD(125, 8);
III. SELECT LENGTH('NewDelhi');
IV. SELECT LEFT('Informatics Practices', 5);
V. SELECT TRIM(email) FROM Students;

4. What will be the output of the following query ?

SELECT MOD (5, 15);

(A) 10 (B) 3 (C) 0 **(D) 5**

5. Which of the following aggregate function returns the average of values in a specified column of a MySQL table ?
(A) AVG(Column) (B) AVERAGE(Column)
(C) MEAN(Column) (D) TOTAL(Column)

8. Now() in MySQL returns _____.
(A) Today's date
(B) Today's date and current time
(C) System's date and time
(D) Name of active database

9. What will be the output of the following query ?

SELECT SUBSTR("Swachh Survekshan",2,4)

(A) wac **(B) wach** (C) shan (D) achh

14. What is the output of the following SQL Query ?

SELECT INSTR("KNOWLEDGE","E");

(A) 7 (B) 5 **(C) 6** (D) – 6

21. Consider the string 'PAINTING'. Write the SQL commands to display the following output :
(i) ING (ii) INT
A) **(i)** SELECT RIGHT('PAINTING',3);
OR
SELECT SUBSTR('PAINTING',6,3);
OR
SELECT SUBSTRING('PAINTING',6,3);
OR
SELECT MID('PAINTING',6,3);
(ii) SELECT SUBSTR('PAINTING',3,3);
OR
SELECT SUBSTRING('PAINTING',3,3);
OR

SELECT MID('PAINTING',3,3);

Consider the table BIKES given below :
Table : **BIKES**

Bid	Bikename	Brandname	Biketype	Cost
1001	Dream Racer	Speedo	Super	1980000
1002	Splendid	Indiana	NULL	50000
1003	Silver Wing	Indiana	Touring	2300000
1004	ZZZZ	WMV	Sports	1500000
1005	CH2H	Speedo	Super	470000
1006	Astor	Victory	Normal	1700000
1007	CHANDRA	WMV	Adventure	3000000
1008	SWISS	WMV	Touring	4200000
1009	SWIFT	ROADY	Super	1900000
1010	CLOUD9	GEM	Normal	1700000

(b) Predict the output of the following queries based on the table BIKES given above :
(i) SELECT UCASE(TRIM(Brandname)) FROM BIKES WHERE Bid = 1003;
(ii) SELECT COUNT(Biketype) FROM BIKES;
A)
(i) INDIANA
(ii) 9

31. Ms. Sridevi is a placement head in a reputed engineering institute and has created the following table to store the records of students getting placement in various companies :
Table : **Placement**

Compid	Company Name	Vacancies	Appeared	Department	DoJ	City
CP01	Rising Star	20	300	Networking	2020-07-02	Bengaluru
CP02	Smoke Ring	30	350	Web Development	2019-07-12	Chennai
CP03	Pilot	15	421	Cloud	2020-08-12	Bengaluru
CP04	Jingle	10	145	Servers	2019-01-23	Hyderabad
CP05	Neel Zone	17	568	Data Analytics	2018-09-02	Bengaluru
CP06	Hard Talk	12	276	Marketing	2020-07-02	Hyderabad

Based on the given table, help Ms. Sridevi to write SQL queries for performing the following tasks :

(ii) To display the joining month name for Rising Star company.
Ms. Sridevi has written following queries. Write the output of each query :
A)
SELECT MONTHNAME(DoJ) FROM Placement
WHERE CompanyName = 'Rising Star';

(iii) SELECT LEFT (CompanyName, INSTR(CompanyName,"R")) FROM Placement where vacancies >=20;
A)

LEFT (CompanyName, INSTR(CompanyName,"R"))
R
Smoke R

33. Consider the tables Faculty and Batch given below :
Table : Faculty

F_Id	FacName	DoJ	Qualification	Salary
Emp01	Neeta Khanna	2013-07-01	MCA	85000
Emp02	Sonia Chawla	2023-05-05	MA	35000
Emp03	Sheetal	2015-06-28	MSc	90000
Emp04	Bindu	2016-03-30	M.Com	80000
Emp05	Sunidhi	2002-06-28	BA	100000
Emp06	Ashish	1999-07-01	B.Com	120000

Table : Batch

Batchid	BatchName	F_Id	Daysperweek	Subjects
B01	TXAlpha	Emp01	3	English
B02	TXBeta	Emp05	5	Chemistry
B03	TXGama	Emp02	4	Physics
B04	Super30	Emp03	3	Mathematics
B05	G-20	EMp04	2	Economics
B06	LXAlpha	Emp01	4	Accountancy

Write SQL queries for the following :
(a) (ii) Display details of faculties who joined on Monday.
A) SELECT * FROM Faculty WHERE DAYNAME(DoJ)='Monday';
OR
SELECT * FROM Faculty WHERE DAYOFWEEK(DoJ)=2;

(iv) Display the details of all faculties whose salary is more than 60000 and have joined before the year 2007.
A) SELECT * FROM Faculty
WHERE Salary>60000 AND YEAR(DoJ)<2007;
OR
SELECT * FROM Faculty WHERE Salary>60000 AND DoJ<"2007-01-01";

33. Consider the tables Faculty and Batch given below :
Table : Faculty

F_Id	FacName	DoJ	Qualification	Salary
Emp01	Neeta Khanna	2013-07-01	MCA	85000
Emp02	Sonia Chawla	2023-05-05	MA	35000
Emp03	Sheetal	2015-06-28	MSc	90000
Emp04	Bindu	2016-03-30	M.Com	80000
Emp05	Sunidhi	2002-06-28	BA	100000
Emp06	Ashish	1999-07-01	B.Com	120000

Table : Batch

Batchid	BatchName	F_Id	Daysperweek	Subjects
B01	TXAlpha	Emp01	3	English
B02	TXBeta	Emp05	5	Chemistry
B03	TXGama	Emp02	4	Physics
B04	Super30	Emp03	3	Mathematics
B05	G-20	EMp04	2	Economics
B06	LXAlpha	Emp01	4	Accountancy

(b) (ii) Display names of faculties after removing leading and trailing spaces.
A) SELECT TRIM(FacName) FROM Faculty;

(iii) Display total number of records in the table Faculty.
A) SELECT COUNT(*) FROM Faculty;
OR
SELECT COUNT(FID) FROM Faculty;

4. What will be the output of the following query ?
SELECT POWER(2,MOD(17,3));
(i) 8 (ii) 1 (iii) 0 **(iv) 4**
5. Which of the following is not an aggregate function in MYSQL ?
(i) AVG( ) (ii) MAX( )
(iii) LCASE( ) (iv) MIN( )
9. What will be the output of the following query ?
SELECT SUBSTR("G20 2023 INDIA", 5, 4);
(i) G20 2 **(ii) 2023** (iii) INDI (iv) 023
14. Which MySQL string function is used to extract a substring from a given string based on a specified starting position and length ?
(i) SUBSTRING_INDEX()
(ii) LENGTH( )
(iii) MID( )
(IV) TRIM( )

22. What will be the output of the following SQL queries :
(i) SELECT RIGHT ("CHANDRAYAN3",4);
(ii) SELECT ROUND(76345.456,2);
Ans)
(i) YAN3
(ii) 76345.46

26.a) Consider the given table and write the following queries in MySQL :
Table: Sports

Sid	SName	Fees	DateofPlay	CoachId
1	Karate	1200	2024-08-24	S1
2	Football	1800	2024-09-13	S2
3	Cricket	1500	2024-06-14	S3
4	Lawn Tennis	2500	2024-09-25	S4
5	Badminton	1800	2024-10-20	S5

(i) To display Sid and name of those sports which are to be played in the month of September.
A) SELECT Sid, SName FROM Sports WHERE Monthname(DateofPlay)= "September";
OR
SELECT Sid, SName FROM Sports WHERE Month(DateofPlay)= 9;
OR
SELECT Sid, SName FROM Sports WHERE Month(DateofPlay)= '9';
OR
SELECT Sid, SName FROM Sports WHERE DateofPlay LIKE "%-09-%";
OR
SELECT Sid, SName FROM Sports WHERE DateofPlay>='2024-09-01' AND DateofPlay<='2024-09-30';
OR
SELECT Sid, SName FROM Sports WHERE DateofPlay BETWEEN '2024-09-01' AND '2024-09-30';

(ii) To display all Sports names in lower case.
A) SELECT LCASE(SName) FROM Sports; OR
SELECT LOWER(SName) FROM Sports;

(iii) To display last two characters of all sports names whose fees is less than 1500.
A) SELECT RIGHT(SName, 2) FROM Sports WHERE Fees<1500;
OR
SELECT MID(SName,LENGTH(SName)-1,2) FROM Sports WHERE Fees<1500;
OR
SELECT SUBSTR(SName,-2) FROM Sports WHERE Fees<1500;
OR
SELECT SUBSTR(SName,LENGTH(SName)-1,2) FROM Sports WHERE Fees<1500;
OR
SELECT SUBSTRING(SName,LENGTH(SName)-1,2) FROM Sports WHERE Fees<1500;

b) Predict the output of the following queries based on the **table Sports** given above :
(i) SELECT UCASE(TRIM(SName)) FROM Sports WHERE Sid=5 ;
A) BADMINTON
(ii) SELECT LEFT (SName,3) FROM Sports WHERE
DateofPlay>"2024-09-13";
A) Law
Bad

(iii) SELECT SUBSTR (CoachId,1) FROM Sports WHERE SName="Cricket" or Fees>=2000;
A) S3
S4

Excellent Consultancy Pvt. Ltd. maintains two tables for all its employees.

Table: Employee

Employee_ id	First_ name	Last_ name	Salary	Joining_date	Department
E101	Monika	Das	100000	2019-01-20	Finance
E102	Mehek	Verma	600000	2019-01-15	IT
E103	Manan	Pant	890000	2019-02-05	Banking
E104	Shivam	Agarwal	200000	2019-02-25	Insurance
E105	Alisha	Singh	220000	2019-02-28	Finance
E106	Poonam	Sharma	400000	2019-05-10	IT
E107	Anshuman	Mishra	123000	2019-06-20	Banking

Write suitable SQL queries for the following task:
(i) Display the year of joining of all the employees from the table Employee.
A) SELECT YEAR(Joining_date) FROM Employee;

4. You have a table called "sales" that contains sales data for a retail store. Which SQL aggregate function can be used to calculate the total number of rows or records in the "sales" table?
a. MAX() b. MIN() c. AVG() **d. COUNT()**

14. Which SQL function can be used to convert a text string to uppercase?
a. UCASE() b. LENGTH() c. MID() d. LTRIM()
Ans. a

16. You are working with a database that stores employee information. You need to retrieve the current date and time. Which SQL function would you use for this purpose?
a. DATE() b. MONTH() c. DAY() d. NOW()

Ans. d
17. Predict the output of the following query:
SELECT ROUND(15.789, 2);
a. 15.79 b. 15.789 c. 16 d. 15.8
Ans. a

21. Consider the given SQL QUERIES:
i. To retrieve the length of the given string "CBSE BOARD SQP 2023!", which SQL function should you use?
a. LCASE() b. MID()
c. LENGTH() d. TRIM()
Ans. c
ii. To find out if symbol is present in the values of email id column or not, which function out of the following should be used?
a. Find( ) b. Instr( )
c. FindStr( ) d. OnStr( )
Ans. b

26. Consider the following records in Cars table and answer the given questions:

CarID	Make	Model	Year	Color	Price
101	Toyota	Camry	2022	Blue	25000.00
102	Honda	Civic	2021	Black	22000.00
103	Ford	Mustang	2023	Brown	35000.00
104	Chevrolet	Equinox	2022	White	28000.00
105	BMW	X5	2023	Blue	45000.00
106	Volkswagen	Golf	2021	Black	20000.00

a. Write SQL query that will give the output as
Blu
Bla
Bro
Blu
Ans. SELECT LEFT(COLOR, 3) FROM Cars WHERE COLOR='Blue' OR COLOR='Black' OR COLOR='Brown';

33. Attempt the following questions:
(i) Write a SQL query to calculate the remainder when 15 is divided by 4.
Ans. SELECT MOD(15, 4) AS Remainder;
(ii) Write a SQL query to retrieve the current year.
Ans. SELECT YEAR(NOW()) AS CurrentYear;
(iii) Write a SQL query to extract the first three characters from the string 'Hello,World!'.
Ans. SELECT LEFT('Hello, World!', 3) AS ExtractedString;
(iv) Write a SQL query to convert the text in the 'description' column of the 'product' table to uppercase.
Ans. SELECT UPPER(description) AS UppercaseDescription FROM product;
(v) Write a SQL query to display the position of'-' in values of ACC_NO column of table Bank.
Ans. SELECT INSTR(acc_no, '-') FROM bank;

Observe the given tables carefully and attempt the following questions:

Table : Bank

ACC_NO	BRANCH_NAME	AMOUNT
B-70	Downtown	5000
B-230	Redwood	6000
B-260	Perryridge	3700

(iii) Write a SQL query to find the total amount of money across all branches.

Ans. SELECT SUM(AMOUNT) AS TOTAL_AMOUNT FROM BANK;

(v) Write a SQL query to find the minimum amount in a bank.

Ans. SELECT MIN(AMOUNT) from BANK;

Observe the given tables carefully and attempt the following questions:

Table : Customer

CUSTOMER_NAME	ACC_NO
Jones	B-170
Smith	B-230
Hayes	B-155

(iv) Write a SQL query to count the total records in CUSTOMER table.

Ans. SELECT COUNT(*) from CUSTOMER;

4. Predict the output of the following query:

SELECT MOD (9,0);

i. 0 **ii. NULL** iii. NaN iv. 9

5. Which of the following SQL functions does not belong to the Math functions category?

i. POWER() ii. ROUND()

iii. **LENGTH()** iv. MOD()

9. Predict the **output** of the following query:

SELECT LCASE (MONTHNAME ('2023-03-05'));

i. May ii. March iii. may **iv. march**

14. In SQL, the **equivalent of UCASE()** is:

i. UPPERCASE () ii. CAPITALCASE()

iii. UPPER() iv. TITLE ()

21. Consider the given SQL string:

"12#All the Best!"

Write suitable SQL queries for the following:

i. Returns the position of the first occurrence of the substring "the" in the given string.

ii. To extract last five characters from the string.

A) i. SELECT INSTR("12#All the Best!","the");

ii. SELECT RIGHT("12#All the Best!",5);

25. What are aggregate functions in SQL? Name any two.

26. Based on the SQL table CAR_SALES,

NUMBER	SEGMENT	FUEL	QT1	QT2
1	Compact HatchBack	Petrol	56000	70000
2	Compact HatchBack	Diesel	34000	40000
3	MUV	Petrol	33000	35000
4	MUV	Diesel	14000	15000
5	SUV	Petrol	27000	54000
6	SUV	Diesel	18000	30000
7	Sedan	Petrol	8000	10000
8	Sedan	Diesel	1000	5000

Predict the output of the following queries based on the table CAR_SALES given above:

i. SELECT LEFT(SEGMENT,2) FROM CAR_SALES WHERE FUEL= "PETROL";

iii. SELECT SUM(QT1) "TOT SALE" FROM CAR_SALES WHERE FUEL= "DIESEL";

A)

i.

LEFT(SEGMENT,2)
Co
MU
SU
Se

iii.

TOT SALE
67000

31. Preeti manages database in a blockchain start-up. For business purposes, she created a table named BLOCKCHAIN. Assist her by writing the following queries:

TABLE: BLOCKCHAIN

id	user	value	hash	transaction_date
1	Steve	900	ERTYU	2020-09-19
2	Meesha	145	@345r	2021-03-23
3	Nimisha	567	#wert5	2020-05-06
4	Pihu	678	%rtyu	2022-07-13
5	Kopal	768	rrt4%	2021-05-15
7	Palakshi	534	wer@3	2022-11-29

i. Write a query to display the year of oldest transaction.

ii. Write a query to display the month of most recent transaction.

iii. Write a query to display all the transactions done in the month of May.

iv. Write a query to count total number of transactions in the year 2022.

A) **i.** SELECT YEAR(MIN(TRANSACTION_DATE)) FROM BLOCKCHAIN;

ii. SELECT MONTH(MAX(TRANSACTION_DATE))

FROM BLOCKCHAIN;
iii. SELECT * FROM BLOCKCHAIN WHERE MONTHNAME (TRANSACTION_DATE)='MAY';
iv. SELECT COUNT(ID) FROM BLOCKCHAIN WHERE YEAR(TRANSACTION_DATE)=2022;

33. Write suitable SQL queries for the following:
i. To calculate the exponent for 3 raised to the power of 4.
ii. To display current date and time.
iii. To round off the value -34.4567 to 2 decimal place.
iv. To remove all the probable leading and trailing spaces from the column userid of the table named user.
v. To display the length of the string 'FIFA World Cup'.

A) **i.** SELECT POWER(3,4);
ii. SELECT NOW();
iii. SELECT ROUND(-34.4567,2);
iv. SELECT TRIM(USERID) FROM USER;
v. SELECT LENGTH("FIFA World Cup");

4. Write the output of the following SQL query :
SELECT LCASE(SUBSTR("Project Management",9,6));
(a) Manag (b) Manage
(c) MANAGE **(d) manage**

5. Write the output of the following SQL command :
select pow(2,2*2);
(a) 16 (b) 2
(c) 4 (d) 8

7. In SQL, returns the month name from the specified date.
(a) MONTH() (b) DATE()
(c) MONTHNAME() (d) NOW()

8. Which of the following SQL function returns the number of values in the specified column ignoring the NULL values ?
(a) COUNT(*) **(b) COUNT(columnname)**
(c) LENGTH(*) (d) LENGTH(columnname)

14. Find the output of the following SQL queries :
Select INSTR("Data Science","ie");
(a) 8 (b) -5 (c) True (d) False

21. Ananya, a database executive, needs to display a system's current date and time. Suggest to her a suitable SQL function name. Also write the query for the same.
A) NOW()
SELECT NOW();

26. Consider the table Customer given below and write SQL commands : TABLE : **Customer**

CustID	Name	Country	Emailid	Orderdate
C1001	Rajat	India	rajat@gmail.com	2022-12-22
C1002	Michael	Denmark	mic@yahoo.com	2023-11-15
C1003	Riyo	Thailand	Ri@gmail.com	2022-05-06
C1004	Jennifer	S.Korea	Jen@gmail.com	2022-08-07
C1005	Sudha	India	Sud@abc.com	2023-01-01
C1006	Vivek	Nepal	viv@xyz.com	2023-04-14

i) Display the details of all customers who have placed the order in the year 2023.
ii) Count the total number of customers from India.
iii) Display the last 9 characters of the email id of all customers of Denmark.

A) **26.i)**
SELECT * FROM Customer WHERE YEAR(Orderdate)=2023;
OR
SELECT * FROM Customer WHERE YEAR(Orderdate) IN ('2023');
OR
SELECT * FROM Customer WHERE YEAR(Orderdate) IN (2023);
OR
SELECT * FROM Customer WHERE YEAR(Orderdate) LIKE '2023';
OR
SELECT * FROM Customer WHERE YEAR(Orderdate) LIKE 2023;

ii) SELECT COUNT(*) FROM Customer WHERE Country= 'India';
OR
SELECT COUNT(Country) FROM Customer WHERE Country ='India';

iii) SELECT RIGHT(Emailid,9) FROM Customer WHERE Country= 'Denmark';
OR
SELECT RIGHT(Emailid,9) FROM Customer WHERE Country IN('Denmark');
OR
SELECT RIGHT(Emailid,9) FROM Customer WHERE Country LIKE 'Denmark;

30. Write the output (i-iii) for the following SQL commands :
Table : CLUB

SNo	Activity	Fee	Days
1	Swimming	10000	M, W
2	Singing	8000	Th, S
3	Dance	12000	M, W
4	Drawing	7000	T, Th
5	Craft	8000	F, S
6	Cooking	9000	T, F

i) SELECT COUNT(*) FROM CLUB;
ii) SELECT SUM(Fee) FROM CLUB;
iii) SELECT LEFT(Activity,2) FROM CLUB
WHERE Days='M,W';

A)
30.i) 6
ii) 54000
iii) Sw
Da

(OR)
b)Find the output of the following SQL queries :
i) SELECT MID("Exam",1,2);
ii) SELECT MONTHNAME("2023-05-30");
iii) SELECT MONTH("2023-03-05");
A) **b.i)** Ex
ii) May
iii) 3

31a) Write the SQL queries which will perform the following operations :
i) To display the day part from your date of admission, which is '2023-12-13'
ii) To convert your father's email id 'xyz@abc.com' to uppercase.
iii) To count the number of characters in the string 'India'
iv) To display today's day name i.e., Sunday or Monday …
v) To display your height 5.41 after rounding off to 1 decimal place.
A) **31a) i)** SELECT DAY('2023-12-13');
ii) SELECT UCASE('xyz@abc.com');
OR
SELECT UPPER('xyz@abc.com');
iii) SELECT LENGTH('India');
iv) SELECT DAYNAME(NOW());
OR
SELECT DAYNAME(SYSDATE());
OR
SELECT DAYNAME(CURDATE());
v) SELECT ROUND(5.41,1);

b) Explain the following SQL functions using suitable examples :
i) LTRIM() ii) RTRIM() iii) INSTR( )
iv) MOD( ) v) TRIM( )

A) **b.i) LTRIM()** function is used to remove any leading spaces (whitespace characters) from a string.
Example: SELECT LTRIM(' HELLO') ;
Output: HELLO
ii) **RTRIM()** function is used to remove any trailing spaces (whitespace characters) from a string.
Example: SELECT RTRIM('HELLO ') ;
Output: HELLO
iii) The INSTR() function is used to find the starting position of a substring within a larger string.
Example: SELECT INSTR("SCIENCE","IE");
Output: 3
iv) MOD() function is used to calculate the remainder of a division operation between two numbers.
Example: SELECT MOD(10,4) ;
Output: 2
v) TRIM() function is used to remove leading and trailing spaces (whitespace characters) from a string.
Example: SELECT TRIM(' HELLO ') ;
Output: HELLO

4. Which of the following is the correct **output** of the following SQL command?
SELECT ROUND (7876.4568, 2);
(i) 7876.46 (ii) 7876.45
(iii) 7900 (iv) 7900.456

5. Aggregate functions are also known as:
(i) Scalar Functions (ii) Single Row Functions
(iii) Multiple Row Functions (iv) Hybrid Functions

7. Ravisha has stored the records of all students of her class in a MYSQL table. Suggest a suitable SQL clause that she should use to display the names of students in **alphabetical order**.
(i) SORT BY (ii) ALIGN BY
(iii) GROUP BY **(iv) ORDER BY**

8. To **remove the leading and trailing space** from data values in a column of MySql Table, we use
(i) Left( ) (ii) Right( )
(iii) Trim( ) (iv) Ltrim( )

9. If the substring is not present in a string, the **INSTR( )** returns:
(i) – 1 (ii) 1 (iii) NULL **(iv) 0**

(14) Which of the following is **not a valid aggregate function** in MYSQL ?

(i) COUNT( ) (ii) SUM( ) (iii) MAX( ) **(iv) LEN( )**

(21) Differentiate between **COUNT( )** and **COUNT(*)** functions in **MYSQL**.
Give **suitable examples** to support your answer.
A) **(21)**

COUNT(Column_Name)	COUNT(*)
It returns the number of non-null values in the column used in COUNT()	It returns the number of rows in the table

Example:

SCode	Sname	Commission
S001	Amit	2500
S002	Jones	
S003	Ahmed	2600

SELECT COUNT(Commission) FROM Sales;
will return 2
SELECT COUNT(*) FROM Sales;
will return 3

(26) Consider the table Patient given below and **write SQL commands**.
Table: Patient

Patientid	Name	City	Phone	Dateofadm	Department
1000001	Ritvik Garg	Delhi	68476213	2021-12-10	Surgery
1000002	Rahil Arora	Mumbai	36546321	2022-01-08	Medicine
1000003	Mehak Bhatt	Delhi	68421879	2022-02-02	Cardiology
1000004	Soumik Rao	Delhi	26543266	2022-01-11	Medicine
1000005	Suresh Sood	Bangalore	65432442	2021-03-09	Surgery

(i) Display the details of all patients who were admitted in January
(ii) Count the total number of patients from Delhi.
(iii) Display the last 2 digits of the Patientid of all patients from Surgery Department.
A)
(26)(i) SELECT * FROM Patient WHERE MONTHNAME(Dateofadm)=”January”;
(ii) SELECT city, count(city) FROM Patient WHERE City=’Delhi’;
OR
SELECT count(city) FROM Patient WHERE City=’Delhi’;
OR
SELECT count(*) FROM Patient WHERE City=’Delhi’;
OR
SELECT count(3) FROM Patient WHERE City=’Delhi’;
(iii) SELECT RIGHT(Patientid,2) FROM Patient;
OR
SELECT SUBSTR(Patientid,length(Patientid)-1,2) FROM Patient;

(30) Write the output (i-iii) for the following SQL commands. **Table: FASHION**

ID	Product	Price	Qty
F01	Kajal	970	10
F02	Foundation	2100	15
F03	Night Cream	1700	20
F04	Day Cream	1400	10
F05	Shampoo	1200	25
F06	Lipstick	850	32

(i) SELECT COUNT(Product) FROM FASHION;
(ii) SELECT SUM (Price*Qty) FROM FASHION WHERE Product="Night Cream";
(iii) SELECT LEFT (Product, 4) FROM FASHION
WHERE Price>1500;
A) **) (i)** 6
(ii) 34000
(iii) Foun
Nigh

Find the output of the following SQL queries :
(i) SELECT SUBSTR("CLIMATE CHANGE",4,4);
(ii) SELECT UCASE(RIGHT("Pollution",3));
(iii) SELECT LENGTH("HAPPY")+3;
A) (i) MATE
(ii) ION
(iii) 8

(31) Write the SQL queries which will perform the following operations:
(i) To display the year from your Date of Admission which is '2023-05-15'.
(ii) To convert your email id 'ABC@XYZ.com' to lowercase.
(iii) To remove leading spaces from a string ‘ my country’.
(iv) To display current date.
(v) To display the value of 10^6

A)
(31) (i) SELECT YEAR(‘2023-05-15’);
OR
SELECT YEAR(DOA) FROM XYZ;

(ii) SELECT LOWER('ABC@XYZ.com'); **OR**
SELECT LCASE('ABC@XYZ.com');
(iii) SELECT LTRIM(' my country'); **OR**
SELECT TRIM(' my country');
(iv) SELECT CURDATE(); **OR**
SELECT SYSDATE(); **OR**
SELECT CURRENT_DATE(); **OR**
SELECT CURRENT_TIMESTAMP() **OR**
SELECT NOW(); **OR**
SELECT DATE(NOW()); **OR**
SELECT LOCALTIME(); **OR**
SELECT LOCALTIMESTAMP();
(v) SELECT POWER(10,6); **OR**
SELECT POW(10,6)

(OR)

Consider a table PRODUCT with the following data: **Table: PRODUCT**

SNO	Itemname	Company	Stockdate	Price	Discount
1	Monitor	HP	2021-12-20	15499.739	15
2	Webcam	Logitech	2020-02-03	4890.90	5
3	Keyboard	Logitech	2022-08-19	1878.985	30
4	Mouse	HCL	2021-05-16	1200.00	7
5	Speakers	iBall	2021-10-19	NULL	25

Write SQL queries using SQL functions to perform the following operations :

(i) Display the first 3 characters of all Itemnames.
(ii) Display the names of all items whose Stockday
is "Monday"
(iii) Display the total price of all the products.
(iv) Display the maximum Price.
(v) Display the average Price of all the products by
the company named 'Logitech'

A)
(i) SELECT LEFT(ITEMNAME,3) FROM PRODUCT; **OR**
SELECT MID(ITEMNAME,1,3) FROM PRODUCT; **OR**
SELECT SUBSTR(ITEMNAME,1,3) FROM PRODUCT; **OR**
SELECT SUBSTRING(ITEMNAME,1,3) FROM PRODUCT;
(ii) SELECT ITEMNAME FROM PRODUCT WHERE DAYNAME(STOCKDATE)='MONDAY';
OR
SELECT ITEMNAME FROM PRODUCT WHERE DAYOFWEEK(STOCKDATE)=2;
(iii) SELECT SUM(PRICE) FROM PRODUCT;
(iv) SELECT MAX(PRICE) FROM PRODUCT;
(v) SELECT AVG(PRICE) FROM PRODUCT WHERE COMPANY='Logitech';

5. If column "Fees" contains the data set (5000,8000,7500,5000,8000), what will be the output after the execution of the given query?
SELECT SUM (DISTINCT Fees) FROM student;
i. 20500 ii. 10000
iii. 20000 iv. 33500

7. Which SQL statement do we use to find out the total number of records present in the table ORDERS?
i. SELECT * FROM ORDERS;
ii. SELECT COUNT (*) FROM ORDERS;
iii. SELECT FIND (*) FROM ORDERS;
iv. SELECT SUM () FROM ORDERS;

8. Which one of the following is not an aggregate function?
i. ROUND() ii. SUM() iii. COUNT() iv. AVG()

9. Which one of the following functions is used to find the largest value from the given data in MySQL?
i. MAX( ) ii. MAXIMUM( )
iii. BIG( ) iv. LARGE( )

14. In SQL, which function is used to display current date and time?
i. Date () ii. Time ()
iii. Current () **iv. Now ()**

26. Write outputs for SQL queries (i) to (iii) which are based on the given table PURCHASE:

TABLE: PURCHASE

CNO	CNAME	CITY	QUANTITY	DOP
C01	GURPREET	NEW DELHI	150	2022-06-11
C02	MALIKA	HYDERABAD	10	2022-02-19
C03	NADAR	DALHOUSIE	100	2021-12-04
C04	SAHIB	CHANDIGARH	50	2021-10-10
C05	MEHAK	CHANDIGARH	15	2021-10-20

i. SELECT LENGTH(CNAME) FROM PURCHASE WHERE QUANTITY>100;
ii. SELECT CNAME FROM PURCHASE WHERE MONTH(DOP)=3;
iii. SELECT MOD (QUANTITY, DAY(DOP)) FROM PURCHASE WHERE CITY= 'CHANDIGARH';

A) **i.** 8
ii. No Output
iii. 0
15

21. What is the purpose of Order By clause in SQL?

Explain with the help of suitable example.

A) **Order By clause:**

The ORDER BY command is used to sort the result set in ascending or descending order.

The following SQL statement displays all the customer's names in alphabetical order:

SELECT Cname FROM Customers ORDER BY Cname;

31. Write suitable SQL query for the following:

i. Display 7 characters extracted from 7th left character onwards from the string 'INDIA SHINING'.

ii. Display the position of occurrence of string 'COME' in the string 'WELCOME WORLD'.

iii. Round off the value 23.78 to one decimal place.

iv. Display the remainder of 100 divided by 9.

v. Remove all the expected leading and trailing spaces from a column userid of the table 'USERS'.

A)

i. select mid('INDIA SHINING',7,7);

ii. select INSTR('WELCOME WORLD','COME');

iii. select round(23.78,1);

iv. select mod(100,9);

v. select trim(userid) from users;

OR

Explain the following SQL functions using suitable examples.

i. UCASE( ) **ii.** TRIM( ) **iii.** MID( )

iv. DAYNAME( ) **v.** POWER( )

A)

1. UCASE(): It converts the string into upper case.

Example: SELECT UCASE('welcome world');

Output: WELCOME WORLD

2. TRIM(): It removes the leading and trailing spaces from the given string.

Example: SELECT TRIM(' Welcome world ');

Output: Welcome world

3. **MID():** It extracts the specified number of characters from given string.

Example: SELECT MID(' Welcome world,4,,4);

Output: Come

4. **DAYNAME():** It returns the weekday name for a given date

Example: SELECT DAYNAME('2022-07-22');

Output: Friday

5. POWER(): It returns the value of a number raised to the power of another number.

Example: SELECT POW(6,2);

Output: 36

34. Shreya, a database administrator has designed a database for a clothing shop. Help her by writing answers of the following questions based on the given table: **TABLE: CLOTH**

CCODE	CNAME	SIZE	COLOR	PRICE	DOP
C001	JEANS	XL	BLUE	990	2022-01-21
C002	T SHIRT	M	RED	599	2021-12-12
C003	TROUSER	M	GREY	399	2021-11-10
C004	SAREE	FREE	GREEN	1299	2019-11-12
C005	KURTI	L	WHITE	399	2021-12-07

i. Write a query to display cloth names in lower case.

ii. Write a query to display the lowest price of the cloths.

A)

34. i. SELECT LOWER(CNAME) FROM CLOTH;

ii. SELECT MIN(PRICE) FROM CLOTH;

3(a) Find the output of the following SQL queries:

(i) SELECT ROUND(21.341, 2);

(ii) SELECT MOD(10, 3);

A) **(a)(i)** 21.34

(ii) 1

3(b) Give any two differences between MOD() and AVG() functions in SQL.

(b) MOD() :

i. It is a math/numeric single row function.

ii. MOD(A,B) returns the remainder after dividing number A by number B.

iii. For Example: SELECT MOD(5,3); will give 2 as output

AVG() :

i. It is an aggregate function

ii. AVG(column) returns the average of the values for the specified column.

iii. For Example : SELECT AVG(QTY) FROM PRODUCT; will give the output 6.0000 if the QTY column has the values 6,8 and 4

5. Find the output of the following SQL queries :

(i) SELECT MID("YOUNG INDIA",5);

(ii) SELECT INSTR("MACHINE INTELLIGENCE","IN");

A) **(i)** G INDIA **(ii)** 5

7(a) Ms. Anubha is working in a school and stores the details of all students in a Table: SCHOOL

Table : SCHOOL

Admid	Sname	Grade	House	Per	Gender	Dob
20150001	Aditya Das	10	Green	86	Male	2006-02-20
20140212	Harsh Sharma	11	Red	50	Male	2004-10-05
20090234	Swapnil Pant	10	Yellow	84	Female	2005-11-21
20130216	Soumen Rao	9	Red	90	Male	2006-04-10
20190227	Rahil Arora	10	Blue	70	Male	2005-05-14
20120200	Akasha Singh	11	Red	70	Female	2004-12-16

Write the SQL statements from the given table to:

(i) Remove TRAILING SPACES from column Sname.

(ii) Display the names of students who were born on Tuesday.

A) **(i)** SELECT RTRIM(Sname) FROM SCHOOL;

(ii) SELECT Sname FROM SCHOOL WHERE

DAYOFWEEK(Dob) = 3;

7(b) Predict the output of the following SQL queries from the above Table: SCHOOL

(i) SELECT AVG(Per) FROM SCHOOL WHERE

House="Red";

(ii) SELECT Sname, Per FROM SCHOOL WHERE

MONTH(Dob)=11;

A) **(i)** 70.0000

(ii) Swapnil Pant 84

8(a) Predict the output of the following SQL queries:

(i) SELECT LENGTH("GOOD LUCK");

(ii) SELECT POWER(3, 3);

(iii) SELECT UPPER("examination");

A) **(i)** 9

(ii) 27

(iii) EXAMINATION

(OR)

(b) Consider a Table "PETDATA" with the following data :

Table : **PETDATA**

Id	Pname	Breed	LifeSpan	Price	Discount
101	Adi	Golden Retriever	15	16000	5
202	Candy	Boxer	11	22000	10
303	Dazzler	Bulldog	10	18000	NULL
404	Cooper	Yorkshire Terrier	16	20000	12
505	Akira	Pug	NULL	25000	8

Write SQL queries for the following :

(i) Display all the pet names in uppercase.

(ii) Display the total price of all the pets.

(iii) Display the average discount available on all the pets.

A) **(i)** SELECT UPPER(Pname) FROM PETDATA;

(ii) SELECT SUM(Price) FROM PETDATA;

(iii) SELECT AVG(Discount) FROM PETDATA;

9.Write the names of SQL functions to perform the following operations :

(a) Display the name of the month from the given date value.

(b) Display the day of month from the given date value.

(c) Count the number of characters in a given string.

A) **(a)** MONTHNAME()

(b) DAYOFMONTH()

(c) LENGTH()

10) Consider the following Table : ITEM :

Table : ITEM

ID	INAME	PRICE	QTY
P1001	Sketch Pen	20.50	5
P1002	Roller Ball Pen	55.00	1
P1003	Gel Pen	25.10	3
P1004	Notebook	75.80	1

Find the output of the following SQL queries :

(c) SELECT LEFT(INAME,3) FROM ITEM;

A) **(c)** Ske

Rol

Gel

Not

11. Consider the Table FURNITURE with the following data : Table : FURNITURE

S.No.	Item	Type	Price	Stockdate
1	Hammock	Bedroom	35500.58	2020-04-21
2	Divan	Living	31000	2019-03-18
3	Bookshelf	Study	38000.657	2019-01-10
4	Writing Desk	Living	61357.425	2020-10-18
5	Nightstand	Bedroom	NULL	2021-07-23

Write SQL queries for the following :

(c) Display the highest Price.

(d) Display the Item with their price rounded to 1 decimal place.

A)

(c) SELECT MAX(PRICE) FROM FURNITURE;

(d) SELECT MAX(PRICE) FROM FURNITURE;

12a) Consider the following table :

Table : EMPLOYEE

Ecode	Ename	Area	Salary	Dept	Doj
S001	Ramesh	North	12000	Sales	2015-12-01
S002	Rohit	South	10500	Finance	2012-08-01
S003	Sunil	South	6800	Front Office	2018-02-01
S004	Sambhav	West	28000	Back Office	2010-04-01
S005	Ankit	East	9000	NULL	2018-10-01
S006	Rishu	North	25000	Finance	2019-02-01

Predict the output for the following SQL queries:

(i) SELECT MAX(Salary), FROM EMPLOYEE;

(ii) SELECT COUNT(Dept) FROM EMPLOYEE;

(iii) SELECT UCASE(Ename) FROM EMPLOYEE
WHERE MONTH(Doj)=2;

(iv) SELECT Ename FROM EMPLOYEE WHERE
Right(Ecode,1)=5;

A)

(i) 28000

OR

Error in command (due to comma after MAX() function)

(ii) 5 **(iii)** SUNIL **(iv)** Ankit
RISHU

Table : EMPLOYEE

Ecode	Ename	Area	Salary	Dept	Doj
S001	Ramesh	North	12000	Sales	2015-12-01
S002	Rohit	South	10500	Finance	2012-08-01
S003	Sunil	South	6800	Front Office	2018-02-01
S004	Sambhav	West	28000	Back Office	2010-04-01
S005	Ankit	East	9000	NULL	2018-10-01
S006	Rishu	North	25000	Finance	2019-02-01

(b) Based on the given table **EMPLOYEE** write SQL queries to perform the following operations:

(i) Count the total number of employees.

(ii) Display the minimum salary from each area.

(iii) Display the average salary from each department where number of employees is more than 1.

(iv) Display all the records in descending order of date of joining.

A) **(i)** SELECT COUNT(*) FROM EMPLOYEE;

(ii) SELECT MIN(Salary), Area FROM EMPLOYEE GROUP BY Area;

(iii) SELECT AVG(Salary), Dept FROM EMPLOYEE GROUP BY Dept HAVING COUNT(*)>1;

(iv) SELECT * FROM EMPLOYEE ORDER BY Doj DESC;

3.Find the output of the following SQL Queries:

(i) SELECT ROUND(7658.345,2)

(ii) SELECT MOD(ROUND(13.9,0),3)

A)

.(i) ROUND(7658.345,2)

(ii) MOD(ROUND(13.9,0),3

7658.35

(OR)

Give any two differences between the POWER() and SUM( ) SQL functions.

POWER( )	SUM( )
Returns single result for each row when applied to a table	Returns single result by grouping all rows of table when applied
It is single row function	It is multiple row function or aggregate function
It takes two arguments	It takes only one argument
Syntax: SELECT POWER(M,N)	**Syntax:** SELECT SUM(column name) FROM table name

Ex: SELECT POWER(3,2);	Ex: SELECT SUM(Salary) FROM Emp;

5. Find the output of the following SQL queries:

a) SELECT SUBSTR("FIT INDIA MOVEMENT",5);

b) SELECT INSTR("ARTIFICIAL INTELLIGENCE","IA");

A)

a)SUBSTR("FIT INDIA MOVEMENT",5)

INDIA MOVEMENT

b)INSTR("ARTIFICIAL INTELLIGENCE","IA")

8

7. Ms Mohini is working in a school and stores the details of all student in a table SCHOOLDATA. (2)

Table : SCHOOLDATA

Admno	Name	Class	House	Percent	Gender	Dob
20150001	Aditya Das	10	Green	86	Male	2006-02-20
20140212	Harsh Sharma	11	Red	75	Male	2004-10-05
20090234	Swapnil Pant	10	Yellow	84	Female	2005-11-21
20130216	Soumen Rao	9	Red	91	Male	2006-04-10
20190227	Rahil Arora	10	Blue	70	Male	2005-05-14
20120200	Akasha Singh	11	Red	64	Female	2004-12-16

Write SQL statements from the above given table to

(i) to remove leading spaces from the column Name

(ii) Display the names of students who were born on Sunday

A)

(i)

SELECT LTRIM(Name) FROM SCHOOLDATA;

SELECT TRIM(Name) FROM SCHOOLDATA

(ii) SELECT NAME FROM SCHOOLDATA WHERE DAYNAME(DOB)='SUNDAY';

OR

Predict the output of the following SQL queries from the given table SCHOOLDATA

(i) SELECT MAX(percent) FROM SCHOOLDATA;

(ii) SELECT LEFT(Gender,1), Name FROM SCHOOLDATA WHERE YEAR(DOB)=2005;

A)

(i) MAX(percent)

91

(ii) LEFT(Gender,1) Name

F Swpanil Pant

M Rahil Arora

8. Predict the output of the following SQL queries:

(i) SELECT TRIM(" ALL THE BEST ");

(ii) SELECT POWER(5,2);

(iii) SELECT UPPER(MID("start up india",10));

A)

(i) A)TRIM(" ALL THE BEST ")

ALL THE BEST

(ii) POWER(5,2)

25

(iii) UPPER(MID("start up india",10))

INDIA

OR

Consider a table "MYPET" with the following data: **Table :** MYPET

Pet_id	Pet_Name	Breed	LifeSpan	Price	Discount
101	Rocky	Labrador Retriever	12	16000	5
202	Duke	German Shepherd	13	22000	10
303	Oliver	Bulldog	10	18000	7
404	Cooper	Yorkshire Terrier	16	20000	12
505	Oscar	Shih Tzu	NULL	25000	8

Write SQL queries for the following:

(i) Display the Breed of all the pets in uppercase.

(ii) Display the total price of all the pets.

(iii) Display the average life span of all the pets.

A)

(i) SELECT UPPER(Breed) FROM MYPET;
SELECT UCASE(Breed) FROM MYPET;
(ii) SELECT SUM(Price) FROM MYPET;
(iii) SELECT AVG(LifeSpan) FROM MYPET;

9. Write the names of SQL functions to perform the following operations: (3)

(i) Display name of the Month from your date of birth.
(ii) Convert email-id to lowercase.
(iii) Count the number of characters in your name.

A)
(i) MONTHNAME( )
(ii) LOWER( ) or LCASE( )
(iii)LENGTH( )

10. Consider the following table: PRODUCT (3)

Table : PRODUCT

PID	PNAME	PRICE	QUANTITY
P1001	Eraser	10.50	5
P1002	Ball Pen	15.00	2
P1003	Gel Pen	25.10	3
P1004	Ruler	5.0	1

Find the output of the following SQL queries:

(i) SELECT 10+MOD(QUANTITY,3) FROM PRODUCT WHERE PNAME=”Eraser”;
(ii) SELECT ROUND(PRICE,2)*QUANTITY FROM PRODUCT WHERE QUANTITY>2;
(iii) SELECT UCASE(RIGHT(PNAME,2)) FROM PRODUCT;

A)
.(i)10+MOD(QUANTITY,3)
12
(ii) ROUND(PRICE,2)*QUANTITY
52.50
75.30
(iii)UCASE(RIGHT(PNAME,2))
ER
EN
EN
ER

11. Consider the table : ITEM (4)

Table : **ITEM**

SNo	Itemname	Type	Price	Stockdate
1	Chaises	Living	11500.58	2020-02-19
2	Accent Chairs	Living	31000.67	2021-02-15
3	Baker Racks	Kitchen	25000.623	2019-01-01
4	Sofa	Living	7000.3	2020-10-18
5	Nightstand	Bedroom	NULL	2021-07-23

Write SQL series for the following:

(i) Display all the records in descending order of Stockdate.
(ii) Display the type and total number of items of each type.
(iii) Display the least price
(iv) Display the Itemname with their price rounded to decimal place.

A)
11. (i) SELECT * FROM ITEM ORDER BY Stockdate DESC;
(ii) SELECT Type, COUNT(*) FROM ITEM GROUP BY Type;
(iii) SELECT MIN(Price) FROM ITEM;
(iv) SELECT Itemname, ROUND(Price,1) FROM ITEM;

12. Consider the following table: (4)

Table : **SALESMAN**

Scode	Sname	Area	Qtysold	Dateofjoin
S001	Ravi	North	120	2015-10-01
S002	Sandeep	South	105	2012-08-01
S003	Sunil	NULL	68	2018-02-01
S004	Subh	West	280	2010-04-01
S005	Ankit	East	90	2018-10-01
S006	Raman	North	NULL	2019-12-01

Predict the output for the following SQL Queries:

(i) SELECT MAX(Qtysold), MIN(Qtysold) FROM SALESMAN;
(ii) SELECT COUNT(Area) FROM SALESMAN;
(iii) SELECT LENGTH(Sname) FROM SALESMAN WHERE MONTH(Dateofjoin)=10;
(iv) SELECT Sname FROM SALESMAN WHERE RIGHT(Scode,1)=5;

A)
(i)MAX(Qtysold) MIN(QTysold)
280 68
(ii)COUNT(Area)
5
(iii)LENGTH(Sname)
4
5

(iv) Sname
Ankit

Table : SALESMAN

Scode	Sname	Area	Qtysold	Dateofjoin
S001	Ravi	North	120	2015-10-01
S002	Sandeep	South	105	2012-08-01
S003	Sunil	NULL	68	2018-02-01
S004	Subh	West	280	2010-04-01
S005	Ankit	East	90	2018-10-01
S006	Raman	North	NULL	2019-12-01

Based on the given table SALESMAN write SQL queries to perform the following operations:
(i) Count the total number of salesman.
(iv) Display all the records in ascending order of area.

A) (i) SELECT COUNT(*) FROM SALESMAN;
(iv) SELECT * FROM SALESMAN ORDER BY AREA ASC;

3. Predict the **output** of the following queries: (2)
i. Select power(5,3); ii. Select mod(5,3);
A)
) i. 125
ii. 2

OR
Briefly explain the **purpose** of the following SQL functions: i. **power()** ii. **mod()**
A)
i. power(): It returns the value of a number raised to the power of another number.
For example: Select power(5,3);
Output: 125
ii. mod(): It returns the remainder of a number divided by another number.
For example: Select mod(5,3);
Output: 2

5. Help Reshma in predicting the **output** of the following queries: (2)
i) select round(8.72,3); ii) select round(9.8);
A) **5.** Output: **i) 8.720** **ii) 10**

7. Mr. Som, a HR Manager in a multinational company "Star-X world" has created the following table to store the records of employees:
Table: Emp

Eid	EName	Department	DOB	DOJ
Star1	Ivan	Sales	1994-08-28	2020-02-14
Star2	Melinda	IT	1997-10-15	2021-11-19
Star3	Raj	Accounts	1998-10-02	2019-04-02
Star4	Michael	Sales	2000-02-17	2020-05-01
Star5	Sajal	IT	2001-12-05	2018-06-13
Star6	John	Accounts	1995-01-03	2019-07-15
Star7	Julia	Sales	1985-11-13	2020-08-19

He has written following queries:
i) select max(year(DOB)) from emp;
ii) select ENAME from emp where month(DOJ)=11;
Predict the output.
A) Output: **i) 2001** **ii) Melinda**

OR
Based on the table given above, help Mr. Som writing queries for the following task:
i) To display the name of eldest employee and his/her date of birth.
ii) To display the name of those employees whose joining month is May.
A) **i) selectENAME,min(year(DOB)) from emp;**
ii) select ENAME from emp where month(DOJ)=5;

8. Predict the **output** of the following queries: (3)
i. select instr('exams@cbse.nic.in','.');
ii. selectsubstr('exams@cbse.nic.in',7,4);
iii. select left('exams@cbse.nic.in',5);
A) 8. Output: **i. 11** **ii. cbse** **iii. exams**

OR
Ms.Saumya is working on a MySQL table named 'Hotel' having following structure:

```
+----------+------------+------+-----+---------+-------+
| Field    | Type       | Null | Key | Default | Extra |
+----------+------------+------+-----+---------+-------+
| user_id  | varchar(20)| YES  |     | NULL    |       |
| name     | varchar(20)| YES  |     | NULL    |       |
| city     | varchar(20)| YES  |     | NULL    |       |
| mobile_no| varchar(11)| YES  |     | NULL    |       |
+----------+------------+------+-----+---------+-------+
```

She need to perform following task on the table:
i. To fetch last 2 characters from the user_id column.
ii. To display the values of name column in lower case.

iii. To display 3 characters from 3rd place from the

column city.

Suggest suitable SQL function for the same. Also write the query to achieve the desired task.

A)

i. right()

```
select right(user_id,2) from hotel;
```

ii. lower()

```
select lower(name) from hotel;
```

iii. mid()/substr()/substring()

```
SELECT MID(CITY,3,3) FROM HOTEL;
```

9. Reena is working with functions of MySQL. Explain her following: (3)

i. What is the purpose of now () function?

ii. How many parameters does it accept?

iii. What is the general format of its return type?

A)

9. i. It returns the current date and time.

ii. None

iii. The return type for NOW() function is either in 'YYYY-MM-DD HH:MM:SS' format or YYYYMMDDHHMMSS.uuuuuu format, depending on whether the function is used in a string or numeric context.

10. While dealing with string data type in MySQL, its observed that sometimes unnecessary space character comes in between which hampers the successful execution of a string manipulation module. Name the suitable MySQL **function (s) to remove leading, trailing and both type of space characters from a string**. Also give MySQL **queries** to depict the same.

A)

10. i. To remove leading space characters: ltrim()

ii. To remove trailing space characters: rtrim()

iii. To remove both type of space characters: trim()

MySQL Queries:

```
Select ltrim(' Hello ');
Select rtrim(' Hello ');
Select trim(' Hello ');
```

Output: Hello

11. Carefully observe the following table named'stock': (4)

Table: stock

Pid	PName	Category	Qty	Price
1	Keyboard	IO	15	450
2	Mouse	IO	10	350
3	Wifi-router	NW	5	2600
4	Switch	NW	3	3000
5	Monitor	O	10	4500
6	Printer	O	4	17000

Write SQL queries for the following:

(a) To display the records in decreasing order of price.

(b) To display category and category wise total quantities of products.

(c) To display the category and its average price.

(d) To display category and category wise highest price of the products.

A)

11. (a) select * from stock order by price desc;

(b) select category, sum(qty) from stock group by category;

(c) selectcategory,avg(price) from stock group by category;

(d) select category, max(price) from stock group by category;

12. Satyam, a database analyst has created the following table: (4)

Table: Student

RegNo	SName	Stream	Optional	Marks
S1001	Akshat	Science	CS	99
S1002	Harshit	Commerce	IP	95
S1003	Devika	Humanities	IP	100
S1004	Manreen	Commerce	IP	98
S1005	Gaurav	Humanities	IP	82
S1006	Saurav	Science	CS	NULL
S1007	Bhaskar	Science	CS	95
S1007	Bhaskar	Science	CS	96

He has written following queries:

(a)select sum(MARKS) from student where OPTIONAL= 'IP' and STREAM= 'Commerce';

(b) select max(MARKS)+min(MARKS) from student where OPTIONAL= 'CS';

(c) selectavg(MARKS) from student where OPTIONAL= 'IP';

(d) select length(SNAME) from student where MARKS is NULL;

Help him in predicting the output of the above given queries.

A) Output: (a) 193 **(b)** 194 **(c)** 93.75 **(d)** 6

OR

Based on the above given table named 'Student', Satyam has executed following queries: Select count(*) from student;
Select count(MARKS) from student;

Predict the output of the above given queries.
Also give proper justifications of the output generated through each query.
A)
First query will produce the output 7.
Justification: count (*) will count and display total number of rows (irrespective of any null value present in any of the column).
Second query will produce the output 6.
Justification: count (col_name) will count and display total number of not null values in the specified column.

3)Write the output of the following SQL command :
select round(3456.885, 2);
(A) 3456.88 (B) 3456.89
(C) 3400 **(D) 3500**

9) An aggregate function performs a calculation on _____ and returns a single value.
(A) single value **(B) multiple values**
(C) no value (D) None of the above

11) Which one of the following would arrange the rows in ascending order in SQL ?
(A) SORT BY (B) ALIGN BY
(C) GROUP BY **(D) ORDER BY**

19) The SQL string function that returns the index of the first occurrence of substring is _____ .
A)INSTR

26) Discuss the purpose of count(*) function with the help of a suitable example.
A)
COUNT(*) is used to return cardinality of selected rows from a table.
Example: SELECT COUNT(*) FROM HOTEL ;

29a) Find the output of the following SQL queries :
(i) SELECT SUBSTR("Innovation",3,4) ;
(ii) SELECT RIGHT("Innovation",5) ;
A) **a) (i)** nova **(ii)** ation
(OR)
(b) Find the output of the following SQL queries :
(i) SELECT INSTR("COVID-19","V") ;
(ii) SELECT MOD(5,2) ;
A) **(i)** 3 **(ii)** 1

37) Consider the following table School :
Table : School

Admno	Name	Class	House	Percentage	Gender
20150001	Abhishek Kumar	10	Green	86	Male
20140212	Mohit Bhardwaj	11	Red	75	Male
20090234	Ramandeep Kaur	10	Yellow	84	Female
20130216	Mukesh Sharma	9	Red	91	Male
20190227	Rahil Arora	10	Blue	70	Male
20120200	Swapnil Bhatt	11	Red	64	Female

Write SQL queries for the following :
(c) Display the minimum Percentage secured by the students of Class 10.
A)(c) SELECT MIN(Percentage) FROM School WHERE Class=10 ;

39a) Write the SQL functions which will perform the following operations :
(i) To display the name of the weekday for your date of birth
(ii) To convert e-mail-id to lowercase
(iii) To count the number of characters in your name
(iv) To display the first character of your name
(v) To calculate the average marks secured by the class
A)
) (i) DAYNAME()
(ii) LCASE() **OR** LOWER()
(iii) LENGTH()
(iv) LEFT() **OR** SUBSTR() **OR** MID() **OR** SUBSTRING()
(v) AVG()

(OR)
(b) Consider a table ITEM with the following data :

S.No.	Itemname	Type	Stockdate	Price	Discount
1	Eating Paradise	Dining Table	19-02-2002	11500.58	25
2	Royal Tiger	Sofa	22-02-2002	31000.67	30
3	Decent	Office Table	01-01-2002	25000.623	30
4	Pink Feather	Baby Cot	20-01-2001	7000.3	20
5	White Lotus	Double Bed	23-02-2002	NULL	25

Write SQL queries using SQL functions to perform the following operations :

(i) Display the first 3 characters of the Itemname.
(ii) Display the month name from the Stockdate.
(iii) Display the total price of the whole stock.
(iv) Display the average Price of all the stocks.
(v) Display all the Price round off up to 2 decimal places.

A)
(b)(i) SELECT LEFT(Itemname,3) FROM ITEM;
OR
SELECT MID(Itemname,1,3) FROM ITEM ;
OR
SELECT SUBSTR(Itemname,1,3) FROM ITEM ;
OR
SELECT SUBSTRING(Itemname,1,3) FROM ITEM ;
(ii) SELECT MONTHNAME(Stockdate) FROM ITEM ;
(iii) SELECT SUM(Price) FROM ITEM ;
(iv) SELECT AVG(Price) FROM ITEM ;
(v) SELECT ROUND(Price,2) FROM ITEM ;

3. Write the output of the following SQL command.
select round(49.88);
a. 49.88 b. 49.8 c. 49.0 **d. 50**

11. The avg( ) function in MySql is an example of _____
a. Math function b. Text function
c. Date Function **d. Aggregate Function**

19. Write the SQL command that will display the current time and date
A) Select now();

Consider the table STUDENT given below:

RollNo	Name	Class	DOB	Gender	City	Marks
1	Anand	XI	6/6/97	M	Agra	430
2	Chetan	XII	7/5/94	M	Mumbai	460
3	Geet	XI	6/5/97	F	Agra	470
4	Preeti	XII	8/8/95	F	Mumbai	492
5	Saniyal	XII	8/10/95	M	Delhi	360
6	Maakhiy	XI	12/12/94	F	Dubai	256
7	Neha	X	8/12/95	F	Moscow	324
8	Nishant	X	12/6/95	M	Moscow	429

(iii) Prachi has given the following command to obtain the highest marks Select max(marks) from student where group by class;
but she is not getting the desired result. Help her by writing the correct command.
a. Select max(marks) from student where group by class;
b. Select class, max(marks) from student group by marks;
c. Select class, max(marks) group by class from student;
d. Select class, max(marks) from student group by class;
A) **iii) d.** Select class, max(marks) from student group by class;

(iv) State the command to display the average marks scored by students of each gender who are in class XI?
i. Select gender, avg(marks) from student where class= "XI" group by gender;
ii Select gender, avg(marks) from student group by gender where class="XI";
iii. Select gender, avg(marks) group by gender from student having class="XI";
iv. Select gender, avg(marks) from student group by gender having class = "XI";
Choose the correct option:
a. Both (ii) and (iii) b. Both (ii) and (iv)
c. Both (i) and (iii) d. Only (iii)

A)
(iv) b. Both (ii) and (iv)
Select gender, average(marks) from student group by gender where class="XI";
OR
Select gender, average(marks) from student group by gender having class = "XI";

(v) Help Ritesh to write the command to display the
name of the youngest student?

a. select name,min(DOB) from student ;
b. select name,max(DOB) from student ;
c. select name,min(DOB) from student group by name ;
d. select name,maximum(DOB) from student;
A) **b.** select name,max(DOB) from student ;

(25) State any two differences between single row functions and multiple row functions. **(2)**
A) Differences between single row functions and multiple row functions.
(i) Single row functions work on one row only whereas multiple row functions group rows
(ii) Single row functions return one output per row whereas multiple row functions return only one output for a specified group of rows.

26) Consider the decimal number x with value 8459.2654. Write commands in SQL to: **(2)**
i. round it off to a whole number
ii. round it to 2 places **before** the decimal.
A) **26)**i. select round(8459.2654);
ii. select round(8459.2654,-2);

28) Anjali writes the following commands with respect to a table employee having fields, empno, name, department, commission. **(2)**
Command1: Select count(*) from employee;
Command2: Select count(commission) from employee;
She gets the output as 4 for the first command but gets an output 3 for the second command.
Explain the output with justification.
A)
This is because the column commission contains a **NULL** value and the aggregate functions do not take into account NULL values. Thus Command1 returns the total number of records in the table whereas Command2 returns the total number of non NULL values in the column commission.

29) Consider the following SQL string: "Preoccupied"
Write commands to display: a. "occupied" b. "cup"
A)
a. select substr("Preoccupied", 4);
(or) select substring("Preoccupied", 4);
(or) select mid("Preoccupied",4);
(or) select right(("Preoccupied"", 8);
b. select substr("Preoccupied" ,6,3);
(or) select substring("Preoccupied", 6,3);
(or) select mid(("Preoccupied" ,6,3);

OR

Considering the same string "Preoccupied"
Write SQL commands to display:
a. the position of the substring 'cup' in the string "Preoccupied"
b. the first 4 letters of the string
A)
a. select instr 'Preoccupied' , ' 'cup'));
b. select left 'Preoccupied',4);

39. Write the SQL functions which will perform the following operations: (5)
i) To display the name of the month of the current date.
ii) To remove spaces from the beginning and end of
a string, " Panorama ".
iii) To display the name of the day eg, Friday or Sunday from your date of birth, dob.
iv) To display the starting position of your first name(fname) from your whole name (name).
v) To compute the remainder of division between two numbers, n1 and n2
A)
i) monthname(date(now()))
ii) trim(" Panaroma ")
iii) dayname(date(dob))
iv) instr(name, fname)
v) mod(n1,n2)

OR

Consider a table SALESMAN with the following data:

SNO	SNAME	SALARY	BONUS	DATE_OF_JOIN
A01	Beena Mehta	30000	45.23	29-10-2019
A02	K. L. Sahay	50000	25.34	13-03-2018
B03	Nisha Thakkar	30000	35.00	18-03-2017
B04	Leela Yadav	80000	NULL	31-12-2018
C05	Gautam Gola	20000	NULL	23-01-1989
C06	Trapti Garg	70000	12.37	15-06-1987
D07	Neena Sharma	50000	27.89	18-03-1999

Write SQL queries using SQL functions to perform the following operations:
a) Display salesman name and bonus after rounding
off to zero decimal places.
b) Display the position of occurrence of the string "ta" in salesman names.
c) Display the four characters from salesman name
starting from second character.
d) Display the month name for the date of join of

salesman

e) Display the name of the weekday for the date of
join of salesman

A)
i) Select sname, round(bonus,0) from Salesman;
ii) Select instr(Sname, "ta") from Salesman;
iii) Select mid(Sname,2,4) from Salesman;
OR
Select Substring(Sname,2,4) from Salesman;
iv) Select monthname(DateofJoin) from Salesman;
v) Select dayname(DateofJoin) from Salesman;

4c) Which of the following are correct aggregate functions in SQL:
(i) AVERAGE() **(ii) MAX()**
(iii) COUNT() (iv) TOTAL()

4g) On the basis of following table answer the given questions: **Table: CUSTOMER_DETAILS**

CUST_ID	CUST_NAME	ACCT_TYPE	ACCUMLT_AMT	DOJ	GENDER
CNR_001	Manoj	Saving	101250	1992-02-19	M
CNR_002	Rahul	Current	132250	1998-01-11	M
CNR_004	Steve	Saving	18200	1998-02-21	M
CNR_005	Manpreet	Current	NULL	1994-02-19	M

(ii) What will be the output of the following query:
Select max(DOJ) From Customer_Details;
A)

```
+------------+
| max(DOJ) |
+------------+
| 1998-02-21 |
+------------+
```

4h) Write commands in SQL for (i) to (iii) and output for (iv) and (v). **Table : Store**

StoreId	Name	Location	City	NoOfEmp	DateOpen	SalesAmt
S101	Planet Fashion	Bandra	Mumbai	7	2015-10-16	40000
S102	Vogue	Karol Bagh	Delhi	8	2015-07-14	120000
S103	Trends	Powai	Mumbai	10	2015-06-24	30000
S104	Super Fashion	Thane	Mumbai	11	2015-02-06	45000
S105	Annabelle	South Extn.	Delhi	8	2015-04-09	60000
S106	Rage	Defence Colony	Delhi	5	2015-03-01	20000

(iv) SELECT MIN(DATEOPEN) FROM STORE;
A)
Min(DateOpen)
2015-02-06

(i) Consider the table FANS and answer the following. **FANS**

FAN_ID	FAN_NAME	FAN_CITY	FAN_DOB	FAN_MODE
F001	SUSHANT	MUMBAI	1998-10-02	MAIL
F002	RIYA	MUMBAI	1997-12-12	LETTER
F003	ANIKA	DELHI	2001-06-30	BLOG
F004	RUDRA	AJMER	2005-08-22	MAIL
F006	MIARA	KOLKATTA	1998-11-01	BLOG

iv. To display the dob of the youngest fan.
A. SELECT MAX(FAN_DOB) FROM FANS;

f) Table student has the columns RNO and SCORE. It has 3 rows in it. Following two SQL statements were entered that produced the output (AVG(SCORE) as 45 and COUNT(SCORE) as 2):
(i) AVG(SCORE) (ii)COUNT(SCORE)
Data in SCORE column is same in two rows. What data is present in the SCORE column in the three rows ?
A)
45
45
NULL

5. Consider the following table 'Transporter' that stores the order details about items to be transported. Write SQL commands for the statements (i) to (viii) and write output for SQL queries (ix) and (x)
Table : TRANSPORTER

ORDERNO	DRIVERNAME	DRIVERGRADE	ITEM	TRAVELDATE	DESTINATION
10012	RAM YADAV	A	TELEVISION	2019-04-19	MUMBAI
10014	SOMNATH SINGH		FURNITURE	2019-01-12	PUNE
10016	MOHAN VERMA	B	WASHING MACHINE	2019-06-06	LUCKNOW
10018	RISHI SINGH	A	REFRIGERATOR	2019-04-07	MUMBAI
10019	RADHE MOHAN		TELEVISION	2019-05-30	UDAIPUR
10020	BISHEN PRATAP	B	REFRIGERATOR	2019-05-02	MUMBAI
10021	RAM		TELEVISION	2019-05-03	PUNE

(x) SELECT MAX(TRAVELDATE)
FROM TRANSPORTER WHERE
DRIVERGRADE='A';
A) **MAX(TRAVELDATE)**
2019-04-19

3c) Consider the following table:
Table: Results

STUDENTID	NAME	EXAMID	SCORE
10	Leena	1	20
10	Leena	2	25
11	Samarth	1	30
11	Samarth	2	35
12	Jai	1	14
12	Jai	2	15
14	Shoaib	1	32
14	Shoaib	2	13

Write the Outputs that the following SQL statements will generate:

(i) SELECT AVG(SCORE) FROM RESULTS WHERE EXAMID = 1;

(ii) SELECT EXAMID, AVG(SCORE) FROM RESULTS GROUP BY EXAMID;

A)

(i) 24

ii)

EXAMID	AVG(SCORE)
1	24
2	22

5. Consider the following table 'Activity'. Write SQL commands for the statements (i) to(viii) and write output for SQL queries (ix) and (x).

Table : Activity

PID	PARTICIPANT	GRADE	EVENT	POINTS	EVENTDATE	HOUSE
101	Amit Dubey	A	Running	200	2018-12-19	Gandhi
102	Shivraj Singh		Hopping bag	300	2019-01-12	Bose
103	Raj Arora	B	Skipping	200	2018-12-19	Gandhi
104	Kapil Raj	A	Bean bag	250	2018-12-19	Bhagat
105	Deepshikha Sen	A	Obstacle	350	2018-03-31	Bose
106	Saloni Raj		Egg & Spoon	200	2018-12-20	Bose

(viii) To display HOUSE wise, Lowest points scored.(ie. Display house and lowest points scored for each house)

A) SELECT HOUSE, MIN(POINTS)
FROM Activity GROUP BY HOUSE;

(ix) SELECT AVERAGE(POINTS) FROM Activity
WHERE HOUSE = ' Gandhi ' or HOUSE = ' Bose ' ;

A)

AVERAGE(POINTS)
250

Topic 4
Working with two tables using equi-join

WORKING ON VEG TABLE
3 Types of Functions
(All types of Queries and Outputs)

Topic 4
Working with two tables using equi-join

EQUI JOIN (Main Answer)

A join is a query that combines rows from two or more tables.

The join, in which columns are compared for equality, is called Equi-Join.

All the columns in the tables – being joined are included in the results.

Ex: (1) Table : Student

Admno	sname	class
1001	Rajesh	XII
1002	Mohan	XI
1003	Sunil	XII

(2) Table : Stuadd

Admno	Address
1001	Bhimavaram
1002	Eluru
1003	Bhimavaram

Query 1 :

SELECT * FROM STUDENT,STUADD WHERE STUDENT.ADMNO=STUADD.ADMNO;

(OR)

SELECT * FROM STUDENT JOIN STUADD ON STUDENT.ADMNO=STUADD.ADMNO;

Admno	sname	class	Admno	Address
1001	Rajesh	XII	1001	Bhimavaram
1002	Mohan	XI	1002	Eluru
1003	Sunil	XII	1003	Bhimavaram

Query 2:

SELECT STUDENT.*,ADDRESS FROM STUDENT,STUADD WHERE STUDENT.ADMNO=STUADD.ADMNO;

Admno	sname	class	ADDRESS
1001	Rajesh	XII	Bhimavaram
1002	Mohan	XI	Eluru
1003	Sunil	XII	Bhimavaram

Query 3:

SELECT S1.SNAME,S2.ADDRESS FROM STUDENT S1, STUADD S2 WHERE S1.ADMNO=S2.ADMNO;

SNAME	ADDRESS
Rajesh	Bhimavaram
Mohan	Eluru
Sunil	Bhimavaram

Example 2:

Answer the question (b) and (c) on the basis of the following tables SHOPPE and ACCESSORIES.

Table: SHOPPE

ID	SName	Area
S01	ABC Computronics	CP
S02	All Infotech Media	GK II
S03	Tech Shopee	CP
S04	Geeks Techno Soft	Nehru Place
S05	Hitech Store	Nehru Place

Table: ACCESSORIES

ID	Iname	Price	Sno
A01	Mother Board	12000	S01
A02	Hard Disk	5000	S01
A03	Keyboard	500	S02
A04	Mouse	300	S01
A05	Mother Board	13000	S02
A06	Keyboard	400	S03
A07	LCD	6000	S04
A08	LCD	5500	S05
A09	Mouse	350	S05
A10	Harddisk	4500	S03

(a) Write an SQL query to display Name, Price of all the Accessories and their respective SName where they are available.

A) SELECT Iname, Price, SName from SHOPPE, ACCESSORIES WHERE SHOPPE.ID=ACCESSORIES.Sno;

(b) Write the output of the following query:

SELECT Iname, Sname from SHOPPE, ACCESSORIES where SHOPPE.ID = ACCESSORIES.SNO AND PRICE>10000;

A) Iname, Sname

Mother Board ABC Computronics

Mother Board All Infotech Media

c) Write the output of the following query:

SELECT Area, Price FROM SHOPPE, ACCESSORIES where SHOPPE.ID= ACCESSORIES.SNO AND ACCESSORIES.ID IN ('A05','A07','A10')

A) Area Price

GK II 13000

Nehru Place 6000

CP 4500

Q) Which statement represent equi join (assuming EMP AND DEPT are table names) ?

(A) SELECT * FROM EMP EQ JOIN DEPT;

(B) SELECT * FROM EMP CROSS JOIN DEPT;

(C) **SELECT * FROM EMP JOIN DEPT;**

(D) SELECT * FROM EMP SP JOIN DEPT;

Ans: C

EQUI JOIN(KV Material)

Joins: Join is query that combines rows from two or more tables, based on a common field between them.

• For joining the tables more than one table is listed in the from clause of Select Command.

E.g: SELECT * FROM EMP, DEPT;

Types of Joins:

1. Cartesian Product
2. Equi Join
3. Natural Join

Cartesian Product :

• It return all possible concatenation of all rows from both table i e one row of First table is joined with all the rows of second table

• Cartesian product join each row of one table with each row of another table

• So if First table have 6 rows and second table have 4 rows then total number of rows in output will be 6 x 4 =24.

Example:

TABLE: DEPT

Deptno	Dname	LOC
10	SALES	CHENNAI
20	RESEARCH	KOLKATA
30	HR	DELHI

TABLE: EMP

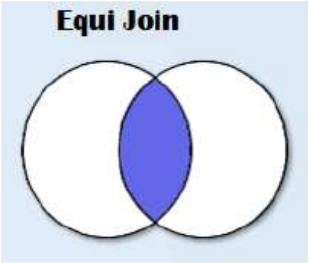
Eno	Ename	Deptno
1	Suresh	10
2	Anoop	20

SELECT * FROM EMP, DEPT;

Eno	Ename	Deptno	Deptno	Dname	LOC
1	Suresh	10	10	SALES	CHENNAI
2	Anoop	20	10	SALES	CHENNAI
1	Suresh	10	20	RESEARCH	KOLKATA
2	Anoop	20	20	RESEARCH	KOLKATA
1	Suresh	10	30	HR	DELHI
2	Anoop	20	30	HR	DELHI

EQUI JOIN: When two tables are joined on the basis of equality.

It performs a JOIN against equality or matching column(s) values of the associated tables.



Ven Diagram

Syntax

SELECT * / Column_list FROM Table1, Table 2
WHERE table1.column=Table2.column;

OR

SELECT * / Column_list FROM Table1 join
Table2 on Table1.Column=Table2.Column;

Example:

SELECT * FROM emp, dept
WHERE emp.deptno=dept.deptno;

OR

SELECT * FROM emp JOIN dept ON
emp.deptno=dept.deptno;

Ex:

Select Eno, Ename,, edp.Deptno, Dname, LOC from Empl, Dept WHERE Emp.Deptno= Dept.Deptno;

Eno	Ename	Deptno	Dname	LOC
1	Suresh	10	SALES	CHENNAI
2	Anoop	20	RESEARCH	KOLKATA

Natural Join: Only one of the identical columns exists.

* The equi join and Natural Join are equivalent except that duplicate columns are eliminated in the Natural Join.

• The JOIN in which only one of the identical columns exists in called Natural Join. It is similar to Equi join except that duplicate columns are eliminated in Natural join that would otherwise appear in Equi Join

•In natural join we specify the names of column to fetch in place of which is responsible of appearing common column twice in.

JOIN on two tables (NCERT)

JOIN operation combines tuples from two tables on specified conditions. This is unlike cartesian product, which make all possible combinations of tuples.

While using the JOIN clause of SQL, we specify conditions on the related attributes of two tables within the FROM clause.

Usually, such an attribute is the primary key in one table and foreign key in another table.

Let us create two tables UNIFORM (UCode, UName, UColor) and COST (UCode, Size, Price) in the SchoolUniform database. UCode is Primary Key in table UNIFORM. UCode and Size is the Composite Key in table COST.

Therefore, Ucode is a common attribute between the two tables which can be used to fetch the common data from both the tables. Hence, we need to define Ucode as foreign key in the Price table while creating this table.

Table 1.17 Uniform table

Ucode	Uname	Ucolor
1	Shirt	White
2	Pant	Grey
3	Tie	Blue

Table 1.18 Cost table

Ucode	Size	Price
1	L	580
1	M	500
2	L	890
2	M	810

Example 1.7

List the UCode, UName, UColor, Size and Price of related tuples of tables UNIFORM and COST.

The given query may be written in three different ways as given below:

a) Using condition in where clause

mysql> SELECT * FROM UNIFORM U, COST C WHERE U.UCode = C.UCode;

Table 1.19 Output of the query

UCode	UName	UColor	Ucode	Size	Price
1	Shirt	White	1	L	580
1	Shirt	White	1	M	500
2	Pant	Grey	2	L	890
2	Pant	Grey	2	M	810

As the attribute Ucode is in both tables, we need to use table alias to remove ambiguity. Hence, we have used qualifier with attribute UCode in SELECT and FROM clauses to indicate its scope.

b) Explicit use of **JOIN** clause

mysql> SELECT * FROM UNIFORM U JOIN COST C ON U.Ucode=C.Ucode;

The output of the query is the same as shown in Table 1.19. In this query, we have used JOIN clause explicitly along with condition in FROM clause. Hence, no condition needs to be given in WHERE clause.

c) Explicit use of **NATURAL JOIN** clause

The output of queries (a) and (b) shown in Table 1.19 has a repetitive column Ucode having exactly the same values. This redundant column provides no additional information. There is an extension of JOIN operation called **NATURAL JOIN** which works similar to JOIN clause in SQL, but removes the redundant attribute. This operator can be used to join the contents of two tables iff there is one common attribute in both the tables.

The above SQL query using NATURAL JOIN is shown below:

mysql> SELECT * FROM UNIFORM NATURAL JOIN COST;

UCode	UName	UColor	Size	Price
1	Shirt	White	L	580
1	Shirt	White	M	500
2	Pant	Grey	L	890
2	Pant	Grey	M	810

It is clear from the output that the result of this query is same as that of queries written in (a) and (b), except that the attribute Ucode appears only once.

Following are some of the points to be considered while applying JOIN operations on two or more relations:

• If two tables are to be joined on equality condition on the common attribute, then one may use JOIN with ON clause or NATURAL JOIN in FROM clause.

If three tables are to be joined on equality condition, then two JOIN or NATURAL JOIN are required.

• In general, N-1 joins are needed to combine N tables on equality condition.

• With JOIN clause, we may use any relational operators to combine tuples of two tables.

CBSE QUESTIONS – MCQs

CBSE QUESTIONS – QUESTIONS

32.A) Consider the following tables:

Table 1:

EMPLOYEE which stores Employee ID (EMP_ID), Employee Name (EMP_NAME), Employee City (EMP_CITY)

Table 2:

PAYROLL which stores Employee ID (EMP_ID), Department (DEPARTMENT), Designation (DESIGNATION), and Salary (SALARY) for various employees.

Note: Attribute names are written within brackets.

Table: EMPLOYEE

EMP_ID	EMP_NAME	EMP_CITY
1	ABHINAV	AGRA
2	KABIR	FARIDABAD
3	ESHA	NOIDA
4	PAUL	SEOUL
5	VICTORIA	LONDON

Table: PAYROLL

EMP_ID	DEPARTMENT	DESIGNATION	SALARY
1	SALES	MANAGER	75000
2	SALES	ASSOCIATE	50000
3	ENGINEERING	MANAGER	95000
4	ENGINEERING	ENGINEER	70000
5	MARKETING	MANAGER	65000

Write appropriate SQL queries for the following:

III. Display employee name along with their corresponding departments.

A) III. SELECT EMP_NAME, DEPARTMENT FROM EMPLOYEE E, PAYROLL P WHERE E.EMP_ID=P.EMP_ID;

32. B) Consider the following tables:

Table 1:

ATHLETE, which stores AthleteID, Name, Country. The table displays basic information of the athletes

Table 2:

MEDALS, which stores AthleteID, Sport, and Medals. The table displays the number of medals won by each athlete in their respective sports.

Table: ATHLETE

AthleteID	Name	COUNTRY
101	Arjun	INDIA
102	Priya	INDIA
103	Asif	UAE
104	Rozy	USA
105	David	DENMARK

Table: MEDALS

AthleteID	Sport	Medals
101	Swimming	8
102	Track	3
103	Gymnastics	5
104	Swimming	2
105	Track	6

A) Write appropriate SQL queries for the following:

III. Display the athlete name along with their corresponding sports

A)

III. SELECT NAME, SPORT FROM ATHLETE A, MEDALS M WHERE A.AthleteID= M.AthleteID;

33. Consider the tables Faculty and Batch given below :

Table : Faculty

F_Id	FacName	DoJ	Qualification	Salary
Emp01	Neeta Khanna	2013-07-01	MCA	85000
Emp02	Sonia Chawla	2023-05-05	MA	35000
Emp03	Sheetal	2015-06-28	MSc	90000
Emp04	Bindu	2016-03-30	M.Com	80000
Emp05	Sunidhi	2002-06-28	BA	100000
Emp06	Ashish	1999-07-01	B.Com	120000

Table : Batch

Batchid	BatchName	F_Id	Daysperweek	Subjects
B01	TXAlpha	Emp01	3	English
B02	TXBeta	Emp05	5	Chemistry
B03	TXGama	Emp02	4	Physics
B04	Super30	Emp03	3	Mathematics
B05	G-20	EMp04	2	Economics
B06	LXAlpha	Emp01	4	Accountancy

Write SQL queries for the following :

(iii) Display names of faculties, their salary and BatchName from both the tables.

A) SELECT FacName, Salary, BatchName FROM Faculty, Batch WHERE Faculty.F_Id = Batch.F_Id;

OR

SELECT FacName,Salary,BatchName FROM Faculty F,Batch B WHERE F.F_Id = B.F_Id;

OR

SELECT FacName,Salary,BatchName FROM Faculty NATURAL JOIN Batch;

(v) Display the name of faculty who is taking TXAlpha Batch.

A) SELECT FacName FROM Faculty, Batch WHERE BatchName = "TXAlpha" AND Faculty.F_Id = Batch.F_Id;

OR

SELECT FacName FROM Faculty, Batch WHERE Faculty.F_Id = Batch.F_Id AND BatchName = "TXAlpha";

OR

SELECT FacName FROM Faculty F, Batch B WHERE F.F_Id = B.F_Id AND BatchName = "TXAlpha";

OR

SELECT FacName FROM Faculty NATURAL JOIN Batch WHERE BatchName = "TXAlpha";

Excellent Consultancy Pvt. Ltd. maintains two tables for all its employees.

Table: Employee

Employee_ id	First_ name	Last_ name	Salary	Joining_date	Department
E101	Monika	Das	100000	2019-01-20	Finance
E102	Mehek	Verma	600000	2019-01-15	IT
E103	Manan	Pant	890000	2019-02-05	Banking
E104	Shivam	Agarwal	200000	2019-02-25	Insurance
E105	Alisha	Singh	220000	2019-02-28	Finance
E106	Poonam	Sharma	400000	2019-05-10	IT
E107	Anshuman	Mishra	123000	2019-06-20	Banking

Table: Reward

Employee_id	Date_reward	Amount
E101	2019-05-11	1000
E102	2019-02-15	5000
E103	2019-04-22	2000
E106	2019-06-20	8000

Write suitable SQL queries to perform the following task :

(iv) Display the first name, last name and amount of reward for all employees from the tables Employee and Reward.

A) SELECT First_name, Last_name, Amount FROM Employee NATURAL JOIN Reward;

OR

SELECT First_name, Last_name, Amount FROM Employee E, Reward R WHERE E.Employee_id=R.Employee_id;

(v) Display first name and salary of all the employees whose amount is less than 2000 from the tables Employee and Reward.

A) SELECT First_name, Salary FROM Employee NATURAL JOIN Reward WHERE Amount<2000;

OR

SELECT First_name, Salary FROM Employee E, Reward R WHERE E.Employee_id=R.Employee_id AND Amount<2000;

Excellent Consultancy Pvt. Ltd. maintains two tables for all its employees.

Table: Employee

Employee_ id	First_ name	Last_ name	Salary	Joining_date	Department
E101	Monika	Das	100000	2019-01-20	Finance
E102	Mehek	Verma	600000	2019-01-15	IT
E103	Manan	Pant	890000	2019-02-05	Banking
E104	Shivam	Agarwal	200000	2019-02-25	Insurance
E105	Alisha	Singh	220000	2019-02-28	Finance
E106	Poonam	Sharma	400000	2019-05-10	IT
E107	Anshuman	Mishra	123000	2019-06-20	Banking

Table: Reward

Employee_id	Date_reward	Amount
E101	2019-05-11	1000
E102	2019-02-15	5000
E103	2019-04-22	2000
E106	2019-06-20	8000

(iii) Display the first name and date of reward of those employees who joined on Monday from the tables Employee and Reward.

A) SELECT First_name, Date_reward FROM Employee NATURAL JOIN Reward WHERE DAYNAME(Joining_date)="Monday";

OR

SELECT First_name, Date_reward FROM Employee E, Reward R WHERE E.Employee_id=R.Employee_id AND DAYNAME(Joining_date)="Monday";

(iv) Display sum of salary of those employees whose reward amount is greater than 3000 from the tables Employee and Reward.

A) SELECT SUM(Salary) FROM Employee NATURAL JOIN Reward WHERE Amount>3000;

OR

SELECT SUM(Salary) FROM Employee E, Reward R WHERE E.Employee_id=R.Employee_id AND Amount>3000;

Observe the given tables carefully and attempt the following questions:

Table : Bank

ACC_NO	BRANCH_NAME	AMOUNT
B-70	Downtown	5000
B-230	Redwood	6000
B-260	Perryridge	3700

Table : Customer

CUSTOMER_NAME	ACC_NO
Jones	B-170
Smith	B-230
Hayes	B-155

(i) Identify the column based on which both the tables can be related or joined. Also justify your answer.

Ans. ACC_NO as it is present in both the tables having related values.

(ii) Write a SQL query to list names of all customers with their Amount in ascending order:

Ans. SELECT C.CUSTOMER_NAME, B.AMOUNT FROM CUSTOMER C JOIN BANK B ON C.ACC_NO = B.ACC_NO ORDER BY B.AMOUNT ASC;

(b) Consider the following tables PARTICIPANT and ACTIVITY and answer the questions that follow:

Table: PARTICIPANT

ADMNO	NAME	HOUSE	ACTIVITYCODE
6473	Kapil Shah	Gandhi	A105
7134	Joy Mathew	Bose	A101
8786	Saba Arora	Gandhi	A102
6477	Kapil Shah	Bose	A101
7658	Faizal Ahmed	Bhagat	A104

Table: ACTIVITY

ACTIVITYCODE	ACTIVITYNAME	POINTS
A101	Running	200
A102	Hopping bag	300
A103	Skipping	200
A104	Bean bag	250
A105	Obstacle	350

(ii) To display Names of Participants, Activity Code, Activity Name in alphabetic ascending order of names of participants.

(iii) To display Names of Participants along with Activity Codes and Activity Names for only those participants who are taking part in Activities that have 'bag' in their Activity Names and Points of activity are above 250.

A)

(ii) SELECT NAME , PARTICIPANT.ACTIVITYCODE , ACTIVITYNAME FORM PARTICIPANT , ACTIVITY WHERE PARTICIPANT.ACTIVITYCODE = ACTIVITY.ACTIVITYCODE ORDER BY NAME ;

OR

SELECT NAME , P.ACTIVITYCODE , ACTIVITYNAME FORM PARTICIPANT P, ACTIVITY A WHERE P.ACTIVITYCODE = A.ACTIVITYCODE ORDER BY NAME ;

OR

SELECT PARTICIPANT.NAME , PARTICIPANT.ACTIVITYCODE , ACTIVITY.ACTIVITYNAME FROM PARTICIPANT, ACTIVITY WHERE PARTICIPANT.ACTIVITYCODE = ACTIVITY.ACTIVITYCODE ORDER BY PARTICIPANT.NAME ;

OR

SELECT P.NAME , P.ACTIVITYCODE , A.ACTIVITYNAME FORM PARTICIPANT P , ACTIVITY A WHERE P.ACTIVITYCODE = A.ACTIVITYCODE ORDER BY P.NAME ;

(iii) SELECT NAME, PARTICIPANT.ACTIVITYCODE , ACTIVITYNAME FROM PARTICIPANT , ACTIVITY WHERE PARTICIPANT.ACTIVITYCODE = ACTIVITY.ACTIVITYCODE AND POINTS > 250 AND ACTIVITYNAME LIKE '%bag%';

OR

SELECT NAME , P.ACTIVITYCODE , ACTIVITYNAME FROM PARTICIPANT P, ACTIVITY A WHERE P.ACTIVITYCODE = A.ACTIVITYCODE AND POINTS > 250 AND ACTIVITYNAME LIKE '%bag%';

.

OR

SELECT PARTICIPANT.NAME , PARTICIPANT.ACTIVITYCODE , ACTIVITY.ACTIVITYNAME FROM PARTICIPANT , ACTIVITY WHERE PARTICIPANT.ACTIVITYCODE = ACTIVITY.ACTIVITYCODE AND

ACTIVITY.POINTS > 250 AND ACTIVTY.ACTIVITYNAME LIKE '%bag%';

OR

SELECT P.NAME , P.ACTIVITYCODE , A.ACTIVITYNAME FROM PARTICIPANT P, ACTIVITY A WHERE P.ACTIVITYCODE = A.ACTIVITYCODE AND A.POINTS > 250 AND A.ACTIVITYNAME LIKE '%bag%';

b) Consider the following tables SUPPLIER and ITEM and answer the questions that follow:

Table: SUPPLIER

SNo	SName	Area	Email
S01	Quant Computers	East	abc@gmail.com
S02	Superb Media	West	sss@hotmail.com
S03	Media Store	North	
S04	Avon Hardware	North	xyz@gmail.com
S05	AV Tech	South	tmt@hotmail.com

Table : ITEM

INo	IName	Price	SNo
N01	Mother Board	15000	S01
N02	Hard Disk	4000	S01
N03	Keyboard	800	S02
N04	Mouse	300	S01
N05	Mother Board	13000	S02
N06	Key Board	400	S03
N07	Hard Disk	4500	S03

(c) With reference to the above given tables (in Q6 b), Write commands in SQL for (i) to (iii)

(i) To display names of Items,SNo and Names of Suppliers supplying those items for those who have stores located in North area.

(ii) To display Names of Items , SNo, Price and corresponding names of their suppliers of all the Items in ascending order of their Price.

A)

(i) SELECT IName,SNo,SName FROM ITEM,SUPPLIER WHERE ITEM.SNo=SUPPLIER.SNo AND AREA = 'North';

OR

SELECT IName,SNo,SName FROM ITEM I, SUPPLIER S WHERE I.SNo=S.SNo AND Area = 'North';

OR

SELECT ITEM.IName,ITEM.SNo, SUPPLIER.SNAME FROM ITEM,SUPPLIER WHERE ITEM.SNo=SUPPLIER.Sno AND SUPPLIER.Area = 'North';

(ii) SELECT INAME,SNo,Price, SName FROM ITEM,SUPPLIER WHERE ITEM.SNo=SUPPLIER.SNo ORDER BY Price;

CBSE – QUESTION BANK QUESTIONS

Q.3.A School in Delhi uses database management system to store student details. The school maintains a database 'school_record' under which there are two tables.

Student Table : Maintains general details about every student enrolled in school.

StuLibrary Table : To store details of issued books. BookID is the unique identification number issued to each book. Minimum issue duration of a book is one Day.

Student	
Field	**Type**
StuID	numeric
StuName	varchar(20)
StuAddress	varchar(50)
StuFatherName	varchar(20)
StuContact	numeric
StuAadhar	numeric
StuClass	varchar(5)
StuSection	varchar(1)

StuLibrary	
Field	**Type**
BookID	numeric
StuID	numeric
Issued_date	Date
Return_date	Date

i. Identify the SQL Query which displays the data of StuLibrary table in ascending order of Student-ID.

i) Select * from StuLibrary Order By BookID
ii) Select * from StuLibrary Order By StuID
iii) Select * from StuLibrary Order By StuID ASC
iv) Select * from StuLibrary Order By StuID DESC

Choose the correct option:

a. Both Query i) and iv) will display the desired data.
b. Both Query i) and ii) will display the desired data.
c. Both Query iii) and iv) will display the desired data.
d. Both Query ii) and iii) will display the desired data.

ii. The Primary Key for StuLibrary Table is/are …….

a. BookID
b. BookID,StuID
c. BookID,Issued_date
d.Issued_date

iii. Which of the following SQL Query will fetch ID of those issued books which have not been returned?
a. SELECT BookID from StuLibrary where BookID is NULL;
b. SELECT BookID from StuLibrary where StuID is NULL;
c. SELECT BookID from StuLibrary where Issued_date is NULL;
d. SELECT BookID from StuLibrary where Return_date is NULL;

iv. The Alternate Key for Student Table will be …….
a. StuName b. StuContact
c. StuAadhar d. StuClass

v. Which of the following SQL Query will display dates on which number of issued books is greater than 5?
a. SELECT Issued_date from StuLibrary GROUP BY Issued_date where COUNT(*)>5;
b. SELECT Issued_date from StuLibrary GROUP BY Return_date having count(*)>5
c. SELECT Issued_date from StuLibrary GROUP BY Issued_date having count(*)>5
d. SELECT Issued_date from StuLibrary GROUP BY Return_date where COUNT(*)>5

Q. 4. Tejasvi Sethi, a car dealer has stored the details of all cars in her showroom in a table called CARMARKET. The table CARMARKET has attributes CARCODE which is a primary key, CARNAME, COMPANY, COLOR, COST (in lakh rupees) of the car and DOM which is the Date of Manufacture of the car.
Answer any four questions based on the table CARMARKET from the below mentioned questions.
Table: **CARMARKET**

CARCODE	CARNAME	COMPANY	COLOR	COST	DOM
C01	BALENO	SUZUKI	BLUE	5.90	2019-11-07
CO2	INDIGO	TATA	SILVER	12.90	2020-10-15
C03	GLC	MERCEDES	WHITE	62.38	2020-01-20
C04	A6	AUDI	RED	58.55	2018-12-29
C05	INNOVA	TOYOTA	BLACK	32.82	2017-11-10
C06	WAGON-R	SUZUKI	WHITE	12.11	2016-11-11
C07	BREZZA	SUZUKI	GOLDEN	9.80	2016-10-03

Choose the correct SQL query to do the following (for parts 1 to 4)
i. Display the carname along with the charges rounded off to 1 digit after decimal place.
a. Select carname,round(cost) from carmarket;
b. Select carname,round.cost(1) from carmarket;
c. Select carname,round.cost() from carmarket;
d. Select carname, round(cost,1) from carmarket;
CORRECT ANSWER – d

ii. Display the carname, color and position of the character 'E' in the color of all the cars.
a. select carname,color from carmarket where color like "%E%";
b. select carname,color,instr(color,'E') from carmarket;
c. select carname,color from carmarket where color = "%E%";
d. select carname,color,substr(color,1,'E') from carmarket;
CORRECT ANSWER – b

iii. Display the carname ,name of the company in lower case of all cars whose year (of dom) is 2020.
a. select carname,lcase(company) from carmarket where year(dom) = 2020;
b. select carname,lcase(company) from carmarket where yearof(dom) like '2020%';
c. select carname,lower(company) from carmarket where dom from '2020-01-01' to '2020-12-31';
d. select carname,lower(company) from carmarket where yearfrom(dom) = 2020;
CORRECT ANSWER - a

iv. Display the number of cars manufactured each year.
a. select count(*),year(dom) from carmarket where year(dom) = distinct;
b. select count(*),year(dom) from carmarket group by year(dom);
c. select count(carmarket),year(dom) from carmarket group by year(dom);
d. select count(distinct *),year(dom) from carmarket group by year(dom);
CORRECT ANSWER - b

v. What is the cardinality and degree of the table CARMARKET?
a. Cardinality = 8 and Degree = 6
b. Cardinality = 6 and Degree = 7
c. Cardinality = 7 and Degree = 6
d. Cardinality = 7 and Degree = 8
CORRECT ANSWER – c

Q.8. A Departmental store 'Iconic' is planning to automate its system so that they can store all the records on computer. They contacted a Software Company to make the software for the same. The company suggested that there is need of a front end and back-end software. The major challenge was to keep the record of all the items available in

the store. To overcome the problem, the software company has shown the glimpses of the database and table required to resolve their problem:

Database Name: Iconic

Table Name: Garment

Attributes of the table: Gcode – Numeric, Gname – Character 25, Size - Character 5, Colour – Character 10, Price – Numeric

Consider the following records in 'Garment' table and answer the given questions:

Table: GARMENT

GCODE	GNAME	SIZE	COLOUR	PRICE
111	Tshirt	XL	Red	1400.00
112	Jeans	L	Blue	1600.00
113	Skirt	M	Black	1100.00
114	Jacket	XL	Blue	4000.00
115	Trousers	L	Brown	1500.00
116	LadiesTop	L	Pink	1200.00

i. Choose the command that will give the output as:

COLOUR
Blu
Bla
Blu
Bro

a. Select left(COLOUR,3) from GARMENT where COLOUR like "B%";
b. Select COLOUR from GARMENT where COLOUR not like "%B%";
c. Select mid(COLOUR,3) from GARMENT where COLOUR like "B%";
d. Select COLOUR from GARMENT where COLOUR = 'B%';
Answer: a

ii. Choose the correct command for the following purpose. To delete the record with GCode as 116
a. Delete * from GARMENT where GCode='116'; b. Delete from GARMENTS where GCode =116; c. Delete from GARMENT where GCode =116;
d. Delete from GARMENT where GCode is '116'; Answer: b

iii. Give the output of :
Select GName, Price from GARMENT order by Price Desc;

a.

GNAME	PRICE
Tshirt	1400.00
Jeans	1600.00
Skirt	1100.00
Jacket	4000.00
Trousers	1500.00
LadiesTop	1200.00

b.

GNAME	PRICE
Skirt	1100.00
LadiesTop	1200.00
Tshirt	1400.00
Trousers	1500.00
Jeans	1600.00
Jacket	4000.00

c.

GNAME	PRICE
Jacket	4000.00
Jeans	1600.00
Trousers	1500.00
Tshirt	1400.00
LadiesTop	1200.00
Skirt	1100.00

d.

GNAME	PRICE
Jacket	4000.00
Jeans	1600.00
LadiesTop	1200.00
Skirt	1100.00
Trousers	1500.00
Tshirt	1400.00

Answer: c

iv. Choose the correct command for the following purpose.
To change the colour of GARMENT with code as 116 to "Orange".
a. Update GARMENTS set COLOUR="Orange" where Gcode=116;
b. Update GARMENT set COLOUR ="Orange" where Gcode=116;
c. Update GARMENT set COLOUR ="Orange" where Gcode is "116";
d. Update GARMENT where Gcode=116 set COLOUR =Orange;
Answer: b

v. What is the degree and cardinality of 'GARMENT' table?
a. Degree=5 & Cardinality=6
b. Degree=6 & Cardinality=5
c. Degree=5 & Cardinality=7
d. Degree=7 & Cardinality=5
Answer: a

vi. Suggest a free software for managing the database a. Oracle b. MySQL c. Sybase d. Microsoft SQL Server Answer: b

Q.15. A Gift Gallery has different stores in India. Database Administrator Abhay wants to maintain database of their Salesmen in SQL to store the data, He has decided that

Name of the database: GiftGallery

Name of the table: Salesman

Attributes of the tables: Scode – Numeric, Sname – Character 25, Address - Character 25, Dojoin - Date, Sales – Numeric and Area – Character 10

Consider the following records in 'Salesman' table and answer the given questions:

Table : Salesman

Scode	Sname	Address	Dojoin	Sales	Area
100	Amit	Delhi	2017/09/29	5000.90	East
101	Sushant	Gurgaon	2018/01/01	7000.75	East
102	Priya	Noida	2018/04/25	3450.45	West
103	Mohit	Delhi	2018/11/03	6000.50	North
104	Priyanshi	Delhi	2019/12/15	8000.62	North

i. State the command that will give the output as :

Sname
Sushant
Priya

a. Select Sname from Salesman Where Not Address =''Delhi'';
b. Select Sname from Salesman Where Address NOT IN("Delhi");
c. Select Sname from Salesman Where Address !="Delhi";
d. All of the above;
Answer: (d) All of the above

ii. Which of the following commands will display the details of all sales record of North Area, regardless of case (whether North / NORTH / north):

a. Select * from salesman where area like upper 'north';
b. Select * from salesman where area = 'North' or 'NORTH' or north;
c. Select * from salesman where upper(area)='NORTH';
d. Select * from salesman where area= =upper('North")';
Answer : (c) Select * from salesman where upper(area)='NORTH';

iii. Help Priya to display sname and sales of east and west areas

a. Select sname, sales from Salesman where area=''East'' and area=''West'';
b. Select sname, sales from Salesman where area=''East'' or area=''West'';
c. Select sname, sales from Salesman where area in ''East'' and ''West'';
d. Select sname, sales from Salesman where area=''East'' , ''West'';
Answer:(b) Select sname, sales from Salesman where area=''East'' or area=''West'';

iv. The command to display the name of the salesman along with the sales amount rounded off to one decimal point will be:

a. Select sname, round(sales,1) from salesman;
b. Select sname, round(sales,0.1) from salesman;
c. Select sname, trunc(sales,1) from salesman;
d. Select sname, trunc(sales,0.1) from salesman;
answer:(a) Select sname, round(sales,1) from salesman;

v. What will be the output of the following command? Select Right(Sname,3), Round(Sales) from Salesman Where Sname Like "P%";

a.

Right(Sname,3)	Round(Sales)
Pri	3450
Pri	8000

b.

Right(Sname,3)	Round(Sales)
iya	3450
shi	8000

c.

Right(Sname,3)	Round(Sales)
iya	3450
shi	8001

d.

Right(Sname,3)	Round(Sales)
Pri	3450
Pri	8001

Answer : (d)

Q.16.

A Fashion Store MyStore is considering to maintain database of their Customers in SQL to store the data, As a Database Administrator Hina has decided that

Name of the database: MyStore
Name of the table: Customer
Attributes of the tables: Acc_No – Numeric, Cust_Name – Character 25, Cust_City - Character 25, Cust_Phone - Character 11, Open_Bal – Numeric

Consider the following records in 'Customer' table and answer the given questions:

Table : Customer

Acc_No	Cust_Name	Cust_City	Cust_Phone	Open_Bal
1001	Dhashmesh	Ambala	9710557614	10000
1002	Sanya	Patna	8223545233	15000
1003	Joe	NewDelhi	9972136576	13000
1004	Mrinal	NewDelhi	9321305453	12000
1005	Ishaan	Agra	9809876798	19000

i. With reference to the above given table, give query for generating following output

Cust_Name
Dhashmesh
Sanya
Ishaan

a. Select Name from Customer where Open_bal<20000;

b. Select Name from Customer where Cust_City like '%a';
c. Select Cust_Name from Customer where Cust_City like '%a';
d. Select Cust_name from Customer where Cust_Name like "a%; Answer : (c) Select Cust_Name from Customer where Cust_City like '%a';

ii. Give the output of :
Select Cust_Name, Open_Bal from Customer order by Open_bal;

a.

Cust_Name	Open_Bal
Dhashmesh	10000
Mrinal	12000
Joe	13000
Sanya	15000
Ishaan	19000

b.

Cust_Name	Open_Bal
Ishaan	19000
Sanya	15000
Joe	13000
Mrinal	12000
Dhashmesh	10000

c.

Cust_Name	Open_Bal
Dhashmesh	10000
Ishaan	19000
Joe	13000
Mrinal	12000
Sanya	15000

d.

Cust_Name	Open_Bal
Dhashmesh	10000
Sanya	15000
Joe	13000
Mrinal	12000
Ishaan	19000

Answer : (a)

iii. Pranay has given the following command to obtain Highest Opening Balance of each City
Select max(Open_Bal) from Customer where group by Cust_City;
but he is not getting the desired result. Help him by writing the correct command.
a. Select Max(Open_Bal) group by Cust_City;
b. Select Max(Open_Bal) from Customer where group by Cust_City;
c. Select Cust_City, Max(Open_Bal) from Customer group by Cust_City;
d. Select max(Open_Bal) from Customer group by Cust_name;
Answer : (c) Select Cust_City, Max(Open_Bal) from Customer group by Cust_City;

iv. Help Pranay find the total no. of records having open_bal between 15000 to 20000 by selecting the right command:
a. Select total from customer having open_bal between 15000 and 20000;;
b. Select count(*) from customer where open_bal between 15000 to 20000;;
c. Select count(*) from customer where open_bal between 15000 and 20000;
d. Select count(*) from customer order by open_bal;
Answer: (c) Select count(*) from customer where open_bal between 15000 and 20000;

v. Choose the correct command to display the first two letters of each customer's name.
a. select right(cust_name,2) from customer;
b. select left(cust_name,2) from customer;
c. select right(cust_name,0,2) from customer;
d. select left(cust_name,2) from customer;
Answer: (b) select left(cust_name,2) from customer;

NCERT SUMMARY

- A Function is used to perform a particular task and return a value as a result.
- Single row functions work on a single row to return a single value.
- Multiple row functions work on a set of records as a whole and return a single value.
- Numeric functions perform operations on numeric values and return numeric values.
- String functions perform operations on character type values and return either character or numeric values.
- Date and time functions allow us to deal with date type data values.
- GROUP BY function is used to group the rows together that contain similar values in a specified column. Some of the group functions are COUNT, MAX, MIN, AVG and SUM.
- Join is an operation which is used to combine rows from two or more tables based on one or more common fields between them.

NCERT EXERCISE

1. Answer the following questions:
a) Define RDBMS. Name any two RDBMS software.
b) What is the purpose of the following clauses in a

select statement?

i) ORDER BY ii) HAVING

c) Site any two differences between Single_row functions and Aggregate functions.

d) What do you understand by Cartesian Product?

e) Write the name of the functions to perform the following operations:

i) To display the day like "Monday", "Tuesday", from the date when India got independence.

ii) To display the specifi ed number of characters from a particular position of the given string.

iii) To display the name of the month in which you were born.

iv) To display your name in capital letters.

2. Write the output produced by the following SQL commands:

a) SELECT POW(2,3);

b) SELECT ROUND(123.2345, 2), ROUND(342.9234,-1);

c) SELECT LENGTH("Informatics Practices");

d) SELECT YEAR("1979/11/26"), MONTH("1979/11/26"), DAY("1979/11/26"), MONTHNAME("1979/11/26");

e) SELECT LEFT("INDIA",3), RIGHT("Computer Science",4);

f) SELECT MID("Informatics",3,4), SUBSTR("Practices",3);

3. Consider the following table named "Product", showing details of products being sold in a grocery shop.

PCode	PName	UPrice	Manufacturer
P01	Washing Powder	120	Surf
P02	Tooth Paste	54	Colgate
P03	Soap	25	Lux
P04	Tooth Paste	65	Pepsodant
P05	Soap	38	Dove
P06	Shampoo	245	Dove

a) Write SQL queries for the following:

i. Create the table Product with appropriate data types and constraints.

ii. Identify the primary key in Product.

iii. List the Product Code, Product name and price in descending order of their product name. If PName is the same then display the data in ascending order of price.

iv. Add a new column Discount to the table Product.

v. Calculate the value of the discount in the table Product as 10 per cent of the UPrice for all those products where the UPrice is more than 100, otherwise the discount will be 0.

vi. Increase the price by 12 per cent for all the products manufactured by Dove.

vii. Display the total number of products manufactured by each manufacturer.

b) Write the output(s) produced by executing the following queries on the basis of the information given above in the table Product:

i. SELECT PName, Average(UPrice) FROM Product GROUP BY Pname;

ii. SELECT DISTINCT Manufacturer FROM Product;

iii. SELECT COUNT(DISTINCT PName) FROM Product;

iv. SELECT PName, MAX(UPrice), MIN(UPrice) FROM Product GROUP BY PName;

4. Using the CARSHOWROOM database given in the chapter, write the SQL queries for the following:

a) Add a new column Discount in the INVENTORY table.

b) Set appropriate discount values for all cars keeping in mind the following:

(i) No discount is available on the LXI model.

(ii) VXI model gives a 10% discount.

(iii) A 12% discount is given on cars other than LXI model and VXI model.

c) Display the name of the costliest car with fuel type "Petrol".

d) Calculate the average discount and total discount available on Car4.

e) List the total number of cars having no discount.

5. Consider the following tables Student and Stream in the Streams_of_Students database. The primary key of the Stream table is StCode (stream code) which is the foreign key in the Student table. The primary key of the Student table is AdmNo (admission number).

AdmNo	Name	StCode
211	Jay	NULL
241	Aditya	S03
290	Diksha	S01
333	Jasqueen	S02
356	Vedika	S01
380	Ashpreet	S03

StCode	Stream
S01	Science
S02	Commerce
S03	Humanities

Write SQL queries for the following:

a) Create the database Streams_Of_Students.

b) Create the table Student by choosing appropriate data types based on the data given in the table.

c) Identify the Primary keys from tables Student and Stream. Also, identify the foreign key from the table Stream.

d) Jay has now changed his stream to Humanities. Write an appropriate SQL query to reflect this change.

e) Display the names of students whose names end with the character 'a'. Also, arrange the students in alphabetical order.

f) Display the names of students enrolled in Science and Humanities stream, ordered by student name in alphabetical order, then by admission number in ascending order (for duplicating names).

g) List the number of students in each stream having more than 1 student.

h) Display the names of students enrolled in different streams, where students are arranged in descending order of admission number.

i) Show the Cartesian product on the Student and Stream table. Also mention the degree and cardinality produced after applying the Cartesian product.
j) Add a new column 'TeacherIncharge" in the Stream table. Insert appropriate data in each row.
k) List the names of teachers and students.
l) If Cartesian product is again applied on Student and Stream tables, what will be the degree and cardinality of this modified table?