

## 5

My SQL Introduction  
and My SQL

## Fastrack« Revision

- **Database:** A database is a collection of related data which represents some aspect of the real world. A database system is designed to be built and populated with data for a certain task.
- **Database Management System:** Database management system is a software which is used to manage the database. For example, MySQL, Oracle, etc., are a very popular commercial database which is used in different applications.
- **DBMS:** It provides an interface to perform various operations like database creation, storing data in it, updating data, creating a table in the database and a lot more.
- **Advantages of Database Systems:**
  - Database systems reduce data redundancy (*data duplication*) to a large extent.
  - Database systems control data inconsistency to a large extent.
  - Databases facilitate sharing of data.
  - Databases enforce standards.
  - Centralised databases can ensure data security.
  - Integrity can be maintained through databases.
- **RDBMS:** RDBMS stands for Relational Database Management System. RDBMS is the basis for SQL and for all modern database systems like MS SQL Server, IBM DB2, Oracle, MySQL and Microsoft Access. A Relational Database Management System (RDBMS) is a Database Management System (DBMS) that is based on the relational model as introduced by E. F. Codd.
- **Different Terms Used in Relational Model:**
  - **Relation:** A table storing logically related data; data must be atomic in a cell; all rows of this table are distinct; ordering of rows and columns is immaterial.
  - **Domain:** This is a pool of values from which the actual values appearing in a given column are drawn.
  - **Tuple:** A row of a relation is generally referred to as a tuple.
  - **Attribute:** A column of a relation is generally referred to as an attribute.
  - **Degree:** This refers to the number of attributes in a relation.
  - **Cardinality:** This refers to the number of tuples in a relation.
  - **View:** It is a virtual table that does not really exist in its own right but is instead derived from one or more underlying base table(s).
- **Primary Key:** This refers to 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 these are candidates for primary key position.
- **Alternate Key:** A candidate key that is not 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.
- **Referential Integrity:** A referential integrity is a system of rules that a DBMS uses to ensure that relationships between records in related tables are valid and that users don't accidentally delete or change related data. You can set referential integrity when all of the following conditions are met:
  - The matching field from the primary table is a primary key or has a unique index.
  - The related fields have the same data type.
  - Both tables belong to the same database. Referential integrity can't be enforced for linked table from databases in other formats.
- **MySQL:** MySQL is a freely available open source Relational Database Management System (RDBMS) that uses Structured Query Language (SQL). It is downloadable from site [www.mysql.org](http://www.mysql.org). In a MySQL database, information is stored in Tables. A single MySQL database can contain many tables at once and store thousands of individual records.
- **MySQL Database System:** MySQL database system refers to the combination of a MySQL server instance and a MySQL database. MySQL operates using client/server architecture in which the server runs on the machine containing the databases and clients connect to the server over a network.
  - **The server** (MySQL server) listens for client requests coming in over the network and accesses database contents according to those requests and provides that to the clients.
  - **Clients** are programs that connect to the database server and issue queries in a pre-specified format. MySQL is compatible with the standards based SQL (Structured Query Language).
- **MySQL and SQL:** In order to access data within the MySQL database, all programs and users must use, Structured



Query Language (SQL). SQL is the set of commands that is recognised by nearly all RDBMSs. The Structured Query Language (SQL) is a language that enables you to create and operate on relational databases, which are sets of related information stored in tables.

- ▶ **Classification of SQL Statements:** SQL provides many different types of commands used for different purposes. SQL commands can be mainly divided into following categories:

- ▶ **Data Definition Language (DDL) Commands:**

Commands that allow you to perform tasks related to data definition for example,

- creating, altering and dropping.
- granting and revoking privileges and roles.
- maintenance commands.

- ▶ **Data Manipulation Language (DML) Commands:**

Commands that allow you to perform data manipulation for example, retrieval, insertion, deletion and modification of data stored in a database.

- ▶ **Transaction Control Language (TCL) Commands:**

Commands that allow you to manage and control the transactions (a transaction is one complete unit of work involving many steps), for example,

- making changes to database, permanent.
- undoing changes to database, permanent.
- creating savepoints.
- setting properties for current transactions.

- ▶ **Accessing Database in MySQL:** Before you start writing SQL commands or making queries upon the data in tables of a database, you need to open the database for use. For this, after logging into MySQL, you need to issue a command.

```
Use <dbname>;
```

- ▶ **Creating Tables in MySQL:** Tables are defined with the CREATE TABLE command. When a table is created, its columns are named, data types and sizes are supplied for each column. Each table must have at least one column.

The syntax of CREATE TABLE command is:

```
CREATE TABLE <table-name>
    (<column name> <data type> [(<size>)],
    <column name> <data type> [(<size>)...]);
```

- ▶ **Inserting Data into Table:** The rows (tuples) are added to relations using INSERT command of SQL. In its simplest form, INSERT takes the following syntax:

```
INSERT INTO <tablename> (<column list>)
VALUES (<value>, <value>...);
```

- ▶ **Inserting Null Values:** To insert value NULL in a specific column, you can type NULL without quotes and NULL will be inserted in that column.

Consider the following statement:

```
INSERT INTO EMPL (Empno, Ename, Job,
Mgr, Hiredate, Sal, Comm, Deptno)
VALUES (8100, 'YASH', 'ANALYST', NULL,
'10-MAY-03', 6000, NULL, 20);
```

- ▶ **Inserting Dates:** Dates are by default entered in 'YYYY-MM-DD' format *i.e.*, first four digits depicting *year*, followed by a hyphen, followed by 2 digits of *month*, followed by a hyphen and a two digit *day*. All this is enclosed in single quotes.

- ▶ **Making Simple Queries Through Select Command:** The SELECT statement is used to pull information from a table. The general form of the statement is:

```
SELECT what_to_select
FROM which_table
WHERE conditions_to_satisfy;
```

- ▶ **Selecting All Data:** The simplest form of SELECT retrieves everything from a table. You just need to specify asterisk in the *select-list* (what\_to\_select), for example,

```
mysql>SELECT *FROM pet;
```

- ▶ **Selecting Particular Rows:** You can select particular rows from a table by specifying filtering condition through WHERE clause of the SELECT statement, for example,

- ▶ Select all pets with gender (sex) as male ('m').

```
mysql>SELECT *FROM pet
WHERE sex = 'm';
```

- ▶ Select all pets that were born on or after Jan 1, 2019.

```
mysql>SELECT *FROM pet
WHERE birth>= '2019-1-1' ; ← date
in yyyy-mm-dd format
```

- ▶ **Selecting Particular Columns:** You can select particular columns by specifying column-names (*i.e.*, attributes) in the *select-list* of the SELECT command for example,

- ▶ Display names and birth-dates of all pets.

```
mysql>SELECT name, birth FROM pet;
```

- ▶ Display owners of pets born after Dec 2018.

```
mysql>SELECT owner FROM pet
WHERE birth> '2018-12-31' ; ← date
in yyyy-mm-dd format
```

- ▶ **Eliminating Redundant Data:** By default, data is selected from all the rows of the table, even if the data appearing in the result gets duplicated. The DISTINCT keyword eliminates duplicate rows from the results of a SELECT statement. For example,

Display names of all pet-owners (non-redundant).

```
mysql>SELECT DISTINCT owner FROM pet;
```

- ▶ **Selecting from All the Rows:** If in place of keyword DISTINCT, you give keyword ALL then the result retains the duplicate output rows. It is just the same as when you specify neither DISTINCT nor ALL; ALL is essentially a clarifier rather than a functional argument. Thus, if you give;



```
SELECT ALL city FROM suppliers;
```

It will give values of *city* column from every row of the table without considering the duplicate entries.

- **Viewing Structure of a Table:** If you want to know the structure of a table, you can use *Describe* or *Desc* command as per following syntax:

```
DESCRIBE | DESC <table name>;
```

- **Searching for NULL:** The NULL value in a column can be searched for in a table using IS NULL in the WHERE clause. (Relational operators like =, <, etc., can't be used with NULL). For example, to list details of all employees whose departments contain NULL (*i.e.*, no value), you use the command:

```
SELECT empno, empname, job
FROM emp WHERE DeptNo IS NULL;
```

- **Creating Table with SQL Constraints:** You already know that a table is created using CREATE TABLE command. The SQL syntax for CREATE TABLE is:

```
CREATE TABLE "table_name"
("column 1" "data_type_for_column_1",
"column 2" "data_type_for_column_2", ...);
```

- **SQL Constraints:** Common types of constraints that are applied on table columns include the following:

S.No.	Constraints	Description
1.	NOT NULL	Ensures that a column cannot have NULL value.
2.	DEFAULT	Provides a default value for a column when none is specified.
3.	UNIQUE	Ensures that all values in a column are different.
4.	CHECK	Makes sure that all values in a column satisfy certain criteria.
5.	Primary Key	Used to uniquely identify a row in the table.
6.	Foreign Key	Used to ensure referential integrity of the data.

- **Applying Table Constraints:** When a constraint is to be applied on a group of columns of the table, it is called **table constraint**. The table constraints appear in the end of table definition. For instance, if you want combination of *icode* and *descp* of table *items* to be unique, you may write it as follows:

```
CREATE TABLE items
( icode   char(5)   NOT NULL,
  descp   char(20)  NOT NULL,
  ROL     integer,
  QOH     integer,
  CHECK   (ROL < QOH),
  UNIQUE  (icode, descp));
```

these are  
a table  
constraints

The above statement ensures that the combination of *icode* and *descp* in each row must be unique.

A constraint applied on one column (for example, as you define **not null** with a column definition) is known as **column constraints**.

- **Modifying Data in Tables:** You can modify data in tables using UPDATE command of SQL. The UPDATE command specifies the rows to be changed using the WHERE clause, and the new data using the SET keyword. The new data can be a specified constant, an expression or data from other tables.

- **Deleting Data from Tables:** To delete some data from tables, you can use SQL DELETE commands. The DELETE command removes rows from a table. This removes the entire rows, not individual field values, so no field argument is needed or accepted.

The DELETE statement takes the following general form:

```
DELETE FROM <tablename>
[WHERE <predicate>]
```

- **Altering Tables:** The ALTER TABLE command is used to change definitions of existing tables. Usually, it is used to add columns to a table. Sometimes it is used to delete columns (depending on privileges) or change their sizes. In general, in MySQL SQL, ALTER TABLE command is used:
  - to add a column.
  - to add an integrity constraint.
  - to redefine a column (data type, size, default value).

- **Dropping Tables:** The DROP TABLE command of SQL lets you drop a table from the database. The syntax for using a DROP TABLE command is:

```
DROP TABLE [IF EXISTS] <tablename>
That is, to drop a table items, you need to write:
DROP TABLE items;
```

- **SQL Functions:** A function is a set of predefined commands that performs specific operation and returns a single value. The functions used in SQL can be categorised into two categories namely single row or scalar functions and multiple row or group or aggregate functions.

- **Differences between Single row and Multiple row Functions:**

S.No.	Single_row Functions	Multiple_row Functions
1.	It operates on a single row at a time.	It operates on groups of rows.
2.	It returns one result per row.	It returns one result for a group of rows.
3.	It can be used Select, Where and Order by clause.	It can be used in the select clause only.
4.	Math, String and Date functions are examples of single row functions.	Max(), Min(), Avg(), Sum(), Count() and Count(*) are examples of multiple row functions.

- **String Functions:** The string functions of MySQL can manipulate the text string in many ways. String functions are broadly divided into two parts:

- Case-manipulation functions.
- Character-manipulation functions.



- **Case-manipulation Functions:** These functions convert case for character strings:

Function	Description	Examples	
		Function	Result
LOWER ()	Returns the argument in lowercase.	LOWER ('SQL')	sql
UPPER ()	Returns the argument in uppercase.	UPPER ('Sql')	SQL
INITCAP ()	Returns the argument's first letter in uppercase and the remaining letters in lowercase.	INITCAP ('SQL')	Sql

- **Character-manipulation Functions:** These functions manipulate character strings:

Function	Description	Examples	
		Function	Result
CHAR ()	Returns the character for each integer passed.	CHAR (65)	A
CONCAT ()	Returns concatenated string.	CONCAT ('HELLO', 'WORLD')	HELLOWORLD
SUBSTR ()	Returns the specified substring.	SUBSTR ('HELLOWORLD', 1, 5)	HELLO
INSTR ()	Finds numeric position of a named character.	INSTR ('HELLO', 'E')	2
LENGTH ()	Shows the length of a string as a numeric value.	LENGTH ('HELLO')	5
TRIM ()	Trims leading or trailing characters (or both) from a character string.	TRIM ('H' FROM 'HELLO')	ELLO
LTRIM ()	Trims leading spaces.	LTRIM ('HELLO')	HELLO
RTRIM ()	Trims trailing spaces.	RTRIM ('HELLO')	HELLO
MID ()	Returns a substring starting from the specified position.	MID ('HELLO', 3)	LLO
LEFT ()	Returns the left most number of characters as specified.	LEFT ('HELLO', 1)	H
RIGHT ()	Returns the right most number of characters as specified.	RIGHT ('HELLO', 2)	LO
ASCII ()	Returns the ASCII value for each character passed.	ASCII ('A')	65

- **Mathematical Functions:** Mathematical functions are also called number functions that accept numeric input and return numeric values.

Function	Description	Examples	
		Function	Result
ROUND ()	Round the column, expression or value to given decimal places.	ROUND (45.926, 2)	45.93
TRUNC ()	Truncates the column, expression or value to specified decimal places.	TRUNC (45.926, 2)	45.92
MOD ()	Returns remainder of division.	MOD (1600, 300)	100
POWER ()	Returns the value of one expression raised to the power of another expression.	POWER (3, 2)	9

- **Date and Time Functions:** Date functions operate on values of the DATE data type:

Function	Description	Examples	
		Function	Result
SYSDATE ()	Returns the current database server date and time.	Select SYSDATE () from Dual;	12-Jan-15
CURDATE ()	Returns the current date.	Select CURDATE () from Dual;	12-Jan-15
NOW ()	Returns the current date and time.	Select NOW () from Dual	12-Jan-15
DATE ()	Extracts the date part of a date or datetime expression.	DATE ('2015-1-12')	12
MONTH ()	Returns the month.	MONTH ('2015-1-12')	1
YEAR ()	Returns the year.	YEAR ('2015-1-12')	2015
DAYNAME ()	Returns the name of week day.	DAYNAME ('2015-1-22')	THURSDAY
DAYOFMONTH ()	Returns the day of month.	DAYOFMONTH ('2015-1-22')	22
DAYOFWEEK ()	Returns the week day index of the argument.	DAYOFWEEK ('2015-1-22')	5
DAYOFYEAR ()	Returns the day of year (1-366).	DAYOFYEAR ('2015-01-07')	7



## Practice Exercise



### Multiple Choice Questions

**Q 1. What is the full form of SQL?**

- a. Structured Query Language
- b. Structured Query List
- c. Simple Query Language
- d. None of the above

**Q 2. What is the full form of DDL?**

- a. Dynamic Data Language
- b. Detailed Data Language
- c. Data Definition Language
- d. Data Derivation Language

**Q 3. What does DML stand for?**

- a. Different Mode Level
- b. Data Mode Language
- c. Data Mode Lane
- d. Data Manipulation Language

**Q 4. Which is the subset of SQL commands used to manipulate database structures, including tables?**

- a. Data Definition Language (DDL)
- b. Data Manipulation Language (DML)
- c. Both a. and b.
- d. None of the above

**Q 5. Which of the following sub-languages of SQL is used to define the structure of the relation, deleting relations and relating schemas?**

- a. DML (Data Manipulation Language)
- b. DDL (Data Definition Language)
- c. Query
- d. Relational Schema

**Q 6. Which of the following sub-languages of SQL is used to query information from the database and to insert tuples into, delete tuples from and modify tuples in the database?**

- a. DML (Data Manipulation Language)
- b. DDL (Data Definition Language)
- c. Query
- d. Relational Schema

**Q 7. Which of the following is a DDL command?**

(CBSE SQP 2020-21)

- a. SELECT
- b. ALTER
- c. INSERT
- d. UPDATE

**Q 8. Which of the following keywords will you use in the following query to display the unique values of the column dept\_name?**

```
SELECT ..... dept_name FROM  
Company;
```

- a. All
- b. from
- c. distinct
- d. name

**Q 9. Which of the following keywords will you use in the following query to display all the values of the column dept\_name?**

```
SELECT ..... dept_name FROM  
Company;
```

- a. All
- b. from
- c. distinct
- d. name

**Q 10. The ..... clause of SELECT query allows us to select only those rows in the result that satisfy a specified condition.**

- a. where
- b. from
- c. having
- d. like

**Q 11. Consider the following query:**

```
SELECT name FROM class WHERE subject  
..... NULL;
```

**Which comparison operator may be used to fill the blank space in above query?**

- a. IS
- b. IS NOT
- c. Either a. or b.
- d. Like

**Q 12. In SQL, which command is used to SELECT only one copy of each set of duplicable rows?**

- a. SELECT DISTINCT
- b. SELECT UNIQUE
- c. SELECT DIFFERENT
- d. All of these

**Q 13. Which of the following types of table constraints will prevent the entry of duplicate rows?**

[CBSE SQP 2020-21]

- a. Unique
- b. Distinct
- c. Primary key
- d. NULL

**Q 14. With reference to SQL, identify the invalid data type:**

[CBSE SQP 2023-24]

- a. Date
- b. Integer
- c. Year
- d. Month

**Q 15. Predict the output of the following query:**

```
SELECT LCASE (MONTHNAME (' 2023-03-05 '));
```

[CBSE SQP 2023-24]

- a. May
- b. March
- c. may
- d. march

**Q 16. In SQL, the equivalent of UCASE() is:**

[CBSE SQP 2023-24]

- a. UPPERCASE ()
- b. CAPITALCASE()
- c. UPPER()
- d. TITLE ()

**Q 17. Which of the following SQL functions does not belong to the Math functions category?**

[CBSE SQP 2023-24]

- a. POWER()
- b. ROUND()
- c. LENGTH()
- d. MOD()

**Q 18. Predict the output of the following query:**

```
SELECT MOD (9,0);
```

[CBSE SQP 2023-24]

- a. 0
- b. NULL
- c. NaN
- d. 9

**Q 19. If the substring is not present in a string, the INSTR () returns:**

[CBSE 2023]

- a. - 1
- b. 1
- c. NULL
- d. 0



Q 20. What will be returned by the given query?

```
SELECT INSTR("INDIA", "DI");
```

- a. 2                                      b. 3
- c. -2                                     d. -3

Q 21. What will be returned by the given query?

```
SELECT concat("It", "was", "Ok");
```

- a. "It was ok"                              b. "It wasok"
- c. "Itwasok"                                d. "Itwas ok"

Q 22. What will be returned by the given query?

```
SELECT Round (153.669, 2);
```

- a. 153.6      b. 153.66      c. 153.67      d. 153.7

Q 23. What will be returned by the given query?

```
SELECT Sign(26);
```

- a. 1                                      b. -1
- c. 0                                      d. None of these

Q 24. What will be returned by the given query?

```
SELECT Truncate(15.79,-1),  
Truncate(15.79, 0), Truncate(15.79,1);
```

- a. 15 15 15.7                              b. 10 15.7 15.9
- c. 10 15 15.7                              d. 10 10 15.9

Q 25. What will be returned by the given query?

```
SELECT month('2020-05-11');
```

- a. 5                                      b. 11
- c. May                                    d. November

Q 26. Which of the following are correct aggregate functions in SQL?

- a. AVERAGE()                              b. MAX()
- c. COUNT()                                d. Either b. or c.

Q 27. Write the output of the following SQL command:

```
Select Round(49.88);                      [CBSE SQP 2020-21]
```

- a. 49.88      b. 49.8      c. 49.0      d. 50

Q 28. The avg () function in MySQL is an example of .....

[CBSE SQP 2020-21]

- a. Math function                              b. Text function
- c. Date function                              d. Aggregate function

Q 29. Which of the following is the correct output of the following SQL command?                      [CBSE 2023]

```
SELECT ROUND (7876.4568, 2);
```

- a. 7876.46                              b. 7876.45
- c. 7900                                    d. 7900.4568

Q 30. To remove the leading and trailing space from data values in a column of MySQL Table, we use:

[CBSE 2023]

- a. Left ()                                    b. Right ()
- c. Trim ()                                    d. Ltrim ()



## Fill in the Blanks Type Questions

Q 31. The SQL keyword ..... is used to specify the table(s) that contains the data to be retrieved.

Q 32. To remove duplicate rows from the result of a query, specify the SQL qualifier ..... in select list.

Q 33. To obtain all columns, use a(n) ..... instead of listing all the column names in the select list.

Q 34. The SQL ..... clause contains the condition that specifies which rows are to be selected.

Q 35. When two conditions must both be true for the rows to be selected, the conditions are separated by the SQL keyword .....

Q 36. To refer to a set of values needed for a condition, we can use the SQL operator .....

Q 37. To exclude one or more values (a list of values) using a condition, the SQL keyword ..... should be used.

Q 38. The SQL keyword ..... is used in SQL expressions to select based on patterns.



## Assertion & Reason Type Questions

Directions (Q. Nos. 39-44): In the questions given below, there are two statements marked as Assertion (A) and Reason (R). Read the statements and choose the correct option.

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.

Q 39. Assertion (A): DBMS provides an interface to perform various operations like database creation, storing data in it, updating data, creating a table in the database and a lot more.

Reason (R): Primary Key refers to a set of one or more attributes that cannot uniquely identify tuples within the relation.

Q 40. Assertion (A): Relation is a pool of values from which the actual values appearing in a given column are drawn.

Reason (R): Degree refers to the number of attributes in a relation.

Q 41. Assertion (A): A referential integrity is a system of rules that a DBMS uses to ensure that relationships between records in related tables are valid and that users don't accidentally delete or change related data.

Reason (R): In Candidate Key all attribute combinations inside a relation that can serve as primary key are candidate keys as these are candidates for primary key position.

Q 42. Assertion (A): MySQL database system refers to the combination of a MySQL server instance and a MySQL database.

Reason (R): The Structured Query Language (SQL) is a language that enables you to create and operate on relational databases, which are sets of related information stored in tables.

Q 43. Assertion (A): Data Manipulation Language (DML) Commands allow you to perform data manipulation e.g., retrieval, insertion, deletion and modification of data stored in a database.

Reason (R): Total Control Language (TCL) Commands allow you to manage and control the transactions.



Q 44. Assertion (A): By default, data is selected from all the rows of the table, even if the data appearing in the result gets duplicated.

Reason (R): The DISTINCT keyword eliminates duplicate rows from the results of a SELECT statement.

## Answers

1. (a)    2. (c)    3. (d)    4. (a)    5. (b)
6. (a)    7. (b)    8. (c)    9. (a)    10. (a)
11. (c)    12. (a)    13. (a)    14. (d)    15. (d)
16. (c)    17. (c)    18. (b)    19. (d)    20. (b)
21. (c)    22. (c)    23. (a)    24. (c)    25. (a)
26. (d)    27. (d)    28. (d)    29. (a)    30. (c)
31. FROM
32. DISTINCT
33. asterisk (\*)
34. WHERE
35. AND
36. IN
37. NOT IN
38. LIKE
39. (c)    40. (d)    41. (b)    42. (b)    43. (c)
44. (b)

Choose the correct option:

- a. I and II
- b. III and IV
- c. I, III and IV
- d. Only III

Q 2. What will be the output of the following command?

```
Select *FROM student WHERE gender = "F"
ORDER BY marks;
```

a.

Roll No.	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.

Roll No.	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

Q 3. 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;

Q 4. 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. II and III
- b. II and IV
- c. I and III
- d. Only III

## Case Study Based Questions

### Case Study 1

Consider the table STUDENT given below:

Roll No.	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

Q 1. 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");

Q 5. Help Ritesh to write the command to display the name of the youngest student.

- SELECT name,min (DOB) FROM student;
- SELECT name,max (DOB) FROM student;
- SELECT name,min (DOB) FROM student GROUP BY name;
- SELECT name, max (DOB) FROM student;

### Answers

1. (b) 2. (b) 3. (d) 4. (b) 5. (b)

## Case Study 2

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		StuLibrary	
Field	Type	Field	Type
StuID	numeric	BookID	numeric
StuName	varchar (20)	StuID	numeric
StuAddress	varchar (50)	Issued_date	Date
StuFatherName	varchar (20)	Return_date	Date
StuContact	numeric		
StuAadhar	numeric		
StuClass	varchar (5)		
StuSection	varchar (1)		

Q 1. Identify the SQL Query which displays the data of StuLibrary table in ascending order of Student-ID.

- SELECT \* FROM StuLibrary ORDER BY BookID;
- SELECT \* FROM StuLibrary ORDER BY StuID;
- SELECT \* FROM StuLibrary ORDER BY StuID ASC;
- SELECT \* FROM StuLibrary ORDER BY StuID DESC;

Choose the correct option:

- Query I and IV will display the desired data.
- Query I and II will display the desired data.
- Query III and IV will display the desired data.
- Query II and III will display the desired data.

Q 2. The primary key for StuLibrary Table is/are

- BookID
- BookID, StuID
- BookID, Issued\_date
- Issued\_date

Q 3. Which of the following SQL Query will fetch ID of those issued books which have not been returned?

- SELECT BookID FROM StuLibrary WHERE BookID is NULL;
- SELECT BookID FROM StuLibrary WHERE StuID is NULL;
- SELECT BookID FROM StuLibrary WHERE Issued\_date is NULL;
- SELECT BookID FROM StuLibrary WHERE Return\_date is NULL;

Q 4. The alternate key for Student Table will be

- StuName
- StuContact
- StuAadhar
- StuClass

Q 5. Which of the following SQL Query will display dates on which number of issued books is greater than 5?

- SELECT Issued\_date FROM StuLibrary GROUP BY Issued\_date WHERE COUNT(\*)>5;
- SELECT Issued\_date FROM StuLibrary GROUP BY Return\_date HAVING count(\*)>5;
- SELECT Issued\_date FROM StuLibrary GROUP BY Issued\_date HAVING count(\*)>5;
- SELECT Issued\_date FROM StuLibrary GROUP BY Return\_date WHERE COUNT(\*)>5;

### Answers

1. (d) 2. (c) 3. (d) 4. (c) 5. (c)

## Case Study 3

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.

Table: CARMARKET

Carcode	Carname	Company	Color	Cost	DOM
C01	BALENO	SUZUKI	BLUE	5.90	2019-11-07
C02	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:

Q 1. Display the carname along with the charges rounded off to 1 digit after decimal place.

- SELECT carname, round(cost) FROM carmarket;
- SELECT carname, round.cost (1) FROM carmarket;
- SELECT carname, round.cost () FROM carmarket;
- SELECT carname, round(cost,1) FROM carmarket;



**Q 2. Display the carname, color and position of the character 'E' in the color of all the cars.**

- `SELECT carname,color FROM carmarket WHERE color LIKE "%E%";`
- `SELECT carname,color, instr (color,'E') FROM carmarket;`
- `SELECT carname,color FROM carmarket WHERE color = "%E%";`
- `SELECT carname,color, substr (color, 1,'E') FROM carmarket;`

**Q 3. Display the carname, name of the company in lower case of all cars whose year (of dom) is 2020.**

- `SELECT carname, lcase(company) FROM carmarket WHERE year(dom) = 2020;`
- `SELECT carname,lcase(company) FROM carmarket WHERE yearof(dom) LIKE '2020%';`
- `SELECT carname,lower(company) FROM carmarket WHERE dom FROM '2020-01-01' to '2020-12-31';`
- `SELECT carname,lower(company) FROM carmarket WHERE yearfrom(dom) = 2020;`

**Q 4. Display the number of cars manufactured each year.**

- `SELECT count (*),year(dom) FROM carmarket WHERE year(dom) = distinct;`
- `SELECT count (*),year(dom) FROM carmarket GROUP BY year(dom);`
- `SELECT count (carmarket),year(dom) FROM carmarket GROUP BY year(dom);`
- `SELECT count (distinct (*),year(dom) from carmarket GROUP BY year(dom);`

**Q 5. What is the cardinality and degree of the table CARMARKET?**

- Cardinality = 8 and Degree = 6
- Cardinality = 6 and Degree = 7
- Cardinality = 7 and Degree = 6
- Cardinality = 7 and Degree = 8

### Answers

1. (d) 2. (b) 3. (a) 4. (b) 5. (c)

## Case Study 4

Write queries for 1. to 4. and find outputs for SQL queries 5. to 6., which are based on the tables.

VCODE	VEHICLETYPE	PERKM
V01	VOLVO BUS	150
V02	AC DELUXE BUS	125
V03	ORDINARY BUS	80
V05	SUV	30
V04	CAR	18

Table: TRAVEL

CNO	CNAME	TRAVELDATE	KM	VCODE	NOP
101	K. Niwal	2015-12-13	200	V01	32
103	Fredrick Sym	2016-03-12	120	V03	45
105	Hltesh Jain	2016-04-23	450	V02	42
102	Ravi Anish	2016-01-13	80	V02	40
107	John Malina	2015-02-10	65	V04	2
104	Sahanubhuti	2016-01-28	90	V05	4
106	Ramesh Jaya	2016-04-06	100	V01	25

**Note:**

- PERKS Is Freight Charges per kilometer.
- Km is kilometers Travelled.
- NOP is number of passengers travelled in vehicle.

**Q 1. To display CNO, CNAME, TRAVELDATE from the table TRAVEL in descending order of CNO.**

**Q 2. To display the CNAME of all customers from the table TRAVEL who are travelling by vehicle with code VO<sub>1</sub> or VO<sub>2</sub>.**

**Q 3. To display the CNO and CNAME of those customers from the table TRAVEL who travelled between '2015-12-31' and '2015-05-01'.**

**Q 4. To display all the details from table TRAVEL for the customers, who have travel distance more than 120 KM in ascending order of NOP.**

**Q 5. SELECT COUNT (\*), VCODE FROM TRAVEL GROUP BY VCODE HAVING COUNT (\*) > 1;**

**Q 6. SELECT DISTINCT VCODE FROM TRAVEL:**

### Answers

- `SELECT CNO, CNAME, TRAVELDATE FROM TRAVEL ORDER BY CNO DESC;`
- `SELECT CNAME FROM TRAVEL WHERE VCODE = 'V01' OR VCODE = 'V02';`

Or

`SELECT CNAME FROM TRAVEL VCODE IN ('V01', 'V02');`

- `SELECT CNO, CNAME FROM TRAVEL WHERE TRAVELDATE >= '2015-05-01' AND TRAVELDATE <= '2015-12-31';`

Or

`SELECT CNO, CNAME FROM TRAVEL WHERE TRAVELDATE BETWEEN '2015-05-01' AND '2015-12-31';`

Or

`SELECT CNO, CNAME FROM TRAVEL WHERE TRAVELDATE <= '2015-12-31' AND TRAVELDATE >= '2015-05-01';`

Or

`SELECT CNO, CNAME FROM TRAVEL WHERE TRAVELDATE BETWEEN '2015-12-31' AND '2015-05-01';`

- `SELECT * FROM TRAVEL WHERE KM > 120 ORDER BY NOP;`



5. COUNT (\*)      VCODE  
                  2              V01  
                  2              V02
6. DISTINCT VCODE  
          V01  
          V02  
          V03  
          V04  
          V05

4. 

5 Male
2 Female
5. 

22
----

## Case Study 5

Consider the following tables SCHOOL and ADMIN and answer the questions:

Table: SCHOOL

CODE	TEACHER	SUBJECT	DOJ	PERIODS	EXPERIENCE
1001	RAVI SHANKAR	ENGLISH	12/3/2000	24	10
1009	PRIYA RAI	PHYSICS	03/09/1998	26	12
1203	LIS ANAND	ENGLISH	09/04/2000	27	5
1045	YASHRAJ	MATHS	24/8/2000	24	15
1123	GANAN	PHYSICS	16/7/1999	28	3
1167	HARISH B	CHEMISTRY	19/10/1999	27	5
1215	UMESH	PHYSICS	11/05/1998	22	16

Table: ADMIN

CODE	GENDER	DESIGNATION
1001	MALE	VICE PRINCIPAL
1009	FEMALE	CO-ORDINATOR
1203	FEMALE	CO-ORDINATOR
1045	MALE	HOD
1123	MALE	SENIOR TEACHER
1167	MALE	SENIOR TEACHER
1215	MALE	HOD

Give the output of the following SQL queries:

- Q 1. SELECT DESIGNATION Count (\*) From ADMIN Group By DESIGNATION Having Count (\*) <2;
- Q 2. SELECT max (EXPERIENCE) from SCHOOL;
- Q 3. SELECT TEACHER from SCHOOL where EXPERIENCE >12 order by TEACHER;
- Q 4. SELECT count (\*), GENDER from ADMIN group by GENDER;
- Q 5. SELECT min (PERIODS) from SCHOOL;

## Answers

1. 

VICE Principal	01
----------------	----
2. 

16
----
3. 

UMESH
YASHRAJ



## Very Short Answer Type Questions

Q 1. Define RDBMS. Name any two RDBMS software.

Ans. RDBMS is short for the term "Relational Database Management System". An RDBMS is a DBMS designed specifically for relational databases, the databases that store data in a structured format using rows and columns.  
 Two popular RDBMS are: MySQL, Oracle.

Q 2. Define the following terms:

(i) Tuple                      (ii) Attribute

Ans. (i) **Tuple**: A row of a relation is generally referred to as a tuple.

(ii) **Attribute**: A column of a relation is generally referred to as an attribute.

Q 3. Define the following terms:

(i) Degree                      (ii) Cardinality

Ans. (i) **Degree**: This refers to the number of attributes in a relation.

(ii) **Cardinality**: This refers to the number of tuples in a relation.

Q 4. Define SQL.

Ans. The Structured Query Language (SQL) is a language that enables us to create and operate on relational databases, which are sets of related information stored in tables.

Q 5. What do you mean by the term MySQL?

Ans. MySQL is a freely available open source Relational Database Management System (RDBMS) that uses Structured Query Language (SQL). It is downloadable from site [www.mysql.org](http://www.mysql.org). In a MySQL database, information is stored in Tables.

## Knowledge BOOSTER



A single MySQL database can contain many tables at once and store thousands of individual records.

Q 6. Explain the term query.

Ans. **Query** is defined as a command given to produce certain specified information from the database table.

Q 7. What are different categories of commands available in SQL?

Ans. SQL commands are classified into:  
 (i) DDL (Data Definition Language)  
 (ii) DML (Data Manipulation Language)  
 (iii) DQL (Data Query Language)  
 (iv) DCL (Data Control Language)

Q 8. Give some example of DML commands.

Ans. INSERT, UPDATE, SELECT.



**Q 9. Explain TCL command.**

**Ans.** Transaction Control Language (TCL) commands allow us to manage and control the transaction.

**Q 10. What is meant by Null values in MySQL?**

**Ans.** Null values signifies a legal empty value.

**Q 11. Table 'club' has 4 rows and 3 columns. Table 'Member' has 2 rows and 5 columns. What will be Cardinality of the Cartesian product of them?**

**Ans.** 8

**Q 12. Mr. Shankar created a table VEHICLE with 3 rows and 4 columns. He added 1 more row to it deleted one column. What is the Cardinality and Degree of the Table VEHICLE?**

**Ans.** Number of cardinality = 4, Number of degree = 3

**Q 13. Mr. James created a table CLIENT with 2 rows and 4 columns. He added 2 more rows to it and deleted one column. What is the Cardinality and Degree of the Table CLIENT?**

**Ans.** Cardinality = 4, Degree = 3

**Q 14. Increase salary of employee records by 10% (table employee).**

**Ans.** Update employee  
Set salary = salary + salary \* 0.10;

**Q 15. Add a constraint (NN-Grade) in table Empl that declares column Grade not null.**

**Ans.** Alter table Empl modify column grade  
int(1) Not null;

**Q 16. Sarthak, a student of class XII, created a table "Class". Grade is one of the columns of this table. 10i the details of students whose Grades have not been entered, he wrote the following MySQL query, which did not give the desired result: SELECT \* FROM Class WHERE Grade = "Null"; Help Sarthak to run the query by removing the errors from the query and write the correct query.**

**Ans.** SELECT \* FROM Class WHERE Grade is Null;

**Q 17. (i) Which SQL command is used to add a new attribute in a table?**

**(ii) Which SQL command is used to modify the existing structure of a table?**

**Ans.** (i) ALTER TABLE (ii) ALTER TABLE

**Q 18. In SQL, write the query to display the list of tables stored in a database.** [CBSE SQP 2020-21]

**Ans.** SHOW TABLES

**Q 19. In SQL, what is the use of IS NULL operator?**

[CBSE SQP 2020-21]

**Ans.** To check if the column has null value/no value.

**Q 20. Define a function.**

**Ans.** A function is a special type of pre-defined command set that perform some operation and returns a single value.

**Q 21. What will be the output of following code?**

```
mysql> SELECT CONCAT (CONCAT ('Inform',  
'atics'), 'Practices');
```

**Ans.** Informatics Practices

**Q 22. What will be the output of following code?**

```
mysql> SELECT LCASE ('INFORMATICS PRACTICES  
CLASS 11TH');
```

**Ans.** Informatics Practices class 11th

**Q 23. What will be the output of following code?**

```
mysql> SELECT UCASE ('Computer studies');
```

**Ans.** COMPUTER STUDIES

**Q 24. What will be the output of following code?**

```
mysql> SELECT CONCAT (LOWER ('Class'), UPPER  
('xi'));
```

**Ans.** classXI

**Q 25. If Str = "INFORMATICS PRACTICES ..." and Str1 = "... FOR CLASS XI"**

**Write commands to print the output as 'Informatics Practices for Class XI.'**

**Ans.** SELECT CONCAT (LOWER (TRIM (TRAILING '.'  
FROM 'INFORMATICS PRACTICES ...')), LOWER  
(TRIM (LEADING '.' FROM '... FOR CLASS  
XI')));

**Q 26. Write commands to display the system date.**

**Ans.** SELECT CURDATE();

**Q 27. Write SQL statement to display Today, the date is <current date>.**

**Ans.** SELECT CONCAT('Today, the date is', CURDATE  
());

**Q 28. Write command to print the day of the week of your birthday in the year 1999.**

**Ans.** SELECT DAYOFWEEK('1999-05-30');

**Q 29. Write a command to display the current time.**

**Ans.** SELECT NOW();

**Q 30. Consider two fields B\_date, which stores the birth date and J\_date, which stores the joining date of an employee. Write commands to find out and display the approximate age of an employee as on today.**

**Ans.** SELECT YEAR (CURDATE()) - YEAR ( B\_date ),  
employee FROM empl;



## Short Answer Type-I Questions

**Q 1. What is SQL? What are different categories of commands available in SQL?**

**Ans.** In order to access data within the Oracle database, all programs and users must use, Structured Query Language (SQL). SQL is the set of commands that is recognised by nearly all RDBMSs.

SQL commands can be divided into following categories:

- Date Definition Language (DDL) Commands.
- Data Manipulation Language (DML) Commands.
- Transaction Control Language (TCL) Commands.
- Session Control Commands.
- System Control Commands.

**Q 2. Differentiate between DDL and DML commands.**

**Ans.** The Data Definition Language (DDL) commands, as the name suggests, allow us to perform tasks



related to data definition. That is, through these commands, we can perform tasks like, create, alter and drop schema objects, grant and revoke privileges, etc.

The Data Manipulation Language (DML) commands, as the name suggests, are used to manipulate data. That is, DML commands query and manipulate data in existing schema objects.

**Q 3. Differentiate between CHAR and VARCHAR datatypes.**

**Ans.** The difference between CHAR and VARCHAR is that of *fixed length* and *variable length*. The CHAR datatype specifies a *fixed length* character string. When a column is given datatype as CHAR(*n*), then MySQL ensures that all values stored in that column have this length *i.e.*, *n* bytes. If a value is shorter than this length *n*, then blanks are added, but the size of value remains *n* bytes.

VARCHAR, on the other hand, specifies a *variable length* string. When a column is given datatype as VARCHAR(*n*), then the maximum size of a value in this column can have *n* bytes. Each value that is stored in this column stores exactly as we specify it *i.e.*, no blanks are added if the length is shorter than maximum length *n*. However, if we exceed the maximum length *n*, then an error message is displayed.

**Q 4. Define data type? What are the main objectives of data types?**

**Ans.** Data type is defined as a set of values along with the operations that can be performed on those values. Some common data types are: Integer, Float, Varchar, Char, String, etc.

Main objectives of data types are:

- (i) Optimum usage of storage space.
- (ii) Represent all possible values.
- (iii) Improve data integrity.

**Q 5. Predict the output of the following queries:**

- (i) **Select power (5, 3);**      (ii) **Select mod (5, 3);**

[CBSE SQP 2022 Term-2]

**Ans.** (i) 125.                      (ii) 2

**Q 6. Briefly explain the purpose of the following SQL functions:**

- (i) **power ()**  
(ii) **mod ()** [CBSE SQP 2022 Term-2]

**Ans.** (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

**Q 7. Help Reshma in predicting the output of the following queries:**

- (i) **select round (8.72,3);**

- (ii) **select round (9.8);** [CBSE SQP 2022 Term-2]

**Ans. Output:**

- (i) 8.720

- (ii) 10

**Q 8. 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. [CBSE SQP 2022 Term-2]**

**Ans.** 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.

**Q 9. 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
Star 1	Ivan	Sales	1994-08-28	2020-02-14
Star 2	Melinda	IT	1997-10-15	2021-11-19
Star 3	Raj	Accounts	1998-10-02	2019-04-02
Star 4	Michael	Sales	2000-02-17	2020-05-01
Star 5	Sajal	IT	2001-12-05	2018-06-13
Star 6	John	Accounts	1995-01-03	2019-07-15
Star 7	Julla	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;**

[CBSE SQP 2022 Term-2]

**Ans. Output:**

- (i) 2001

- (ii) Melinda

**Q 10. 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.**

**Ans.** (i) **select ENAME, min (year (DOB)) form Emp;**

- (ii) **select ENAME from Emp where month (DOJ)=5;**



**Q 11. What is foreign key? How do you define a foreign key in your table?**

**Ans.** A foreign key is a column or group of columns in a relational database table that provides a link between data in two tables. It acts as a cross-reference between tables because it references the primary key of another table, thereby establishing a link between them.

A foreign key is a key used to link two tables together. It is a field (or collection of fields) in one table that refers to the PRIMARY KEY in another table. Foreign key (<column name>) REFERENCES <parent table name> (<Column name>).

**Q 12. How are foreign key commands different from primary key command?**

**Ans.** Foreign key commands are different from primary key commands in the following ways:

- (i) Primary key cannot accept null values while foreign key can accept multiple null values.
- (ii) Only one primary key is in a table while more than one foreign key is present in a table.
- (iii) Primary key uniquely identifies a record in the table while foreign key is a field in the table that is primary key in another table.

**Q 13. How are foreign key commands related to the primary key?**

**Ans.** A primary key-foreign key relationship defines a one-to-many relationship between two tables in a relational database. A foreign key is a column or a set of columns in one table that references the primary key columns in another table. The primary key is defined as a column (or set of columns) where each value is unique and identifies a single row of the table.

**Q 14. What is the use of UPDATE statement in SQL? How is it different from ALTER statement?**

**Ans.** The UPDATE statement in SQL is used to update the data of an existing table in database.

ALTER is a DDL (Data Definition Language) statement whereas UPDATE is a DML (Data Manipulation Language) statement. ALTER is used to update the structure of the table (add/remove field/index etc.) whereas UPDATE is used to update data.

**Q 15. What are table constraints? What are column constraints? How are these two different?**

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

The two basic type of constraints are column constraints and table constraints. The difference between the two is that column constraints apply only to individual columns, whereas table constraints apply to group of one or more columns.

**Q 16. 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 specified 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.

**Ans.** (i) Day Name() (ii) Mid()  
(iii) Month() (iv) Ucase()

**Q 17. Insert all those records of table Accounts into table Pending where amt\_outstanding is more than 10000.**

**Ans.** CREATE TABLE Pending AS  
SELECT \* FROM Accounts WHERE amt\_outstanding > 10000;

**Q 18. Differentiate between:**

(i) DROP TABLE, DROP DATABASE

(ii) DROP TABLE, DROP clause of ALTER TABLE.

**Ans.** (i) DROP TABLE deletes table or relation from database. DROP DATABASE deletes the database from MYSQL server.

(ii) DROP TABLE deletes table or relation from database. DROP clause of ALTER TABLE deletes a particular column or field from table or relation.

**Q 19. Anjali writes the following commands with respect to a table employee having fields, empno, name, department, commission.**

**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. [CBSE SQP 2020-21]

**Ans.** 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'.

**Q 20. Mr. Mittal is using a table with following columns: Name, Class, Stream\_Id, Stream\_name. He needs to display names of students who have not been assigned any stream or have been assigned stream\_name that ends with "computers". He wrote the following command, which did not give the desired result.**

```
SELECT Name, Class FROM Students
WHERE Stream_name = NULL OR Stream_name
= "%computers" ;
```

**Help Mr. Mittal to run the query by removing the error and write correct query.**

**Ans.** SELECT Name, Class FROM Students  
WHERE Stream\_name is NULL OR Stream\_name  
like "%computers" ;

**Q 21. The Doc\_name Column of a table HOSPITAL is given below:**

Doc_name
Avinash
Harlharan
Vinayak
Deepak
Sanjeev



Based on the information, find the output of the following queries:

- (i) `SELECT doc_name FROM HOSPITAL WHERE Doc_name like "%v%";`  
 (ii) `SELECT doc_name FROM HOSPITAL WHERE doc_name like "%e%";`

Ans.

(i)	Doc_name	(ii)	Doc_name
	Sanjeev		Deepak
			Sanjeev

Q 22. What is the purpose of DROP TABLE command in MySQL? How is it different from DELETE Command?

Ans. Delete is used to remove the rows, while drop is used to remove the tables and DB. Delete – removes the rows from the table where clause can be used to delete specific rows.

Q 23. 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 key from the table TRANSACTIONS.

Ans. (i) Degree of the table TRANSACTIONS = 4;

Cardinality of the table CUSTOMERS = 3

(ii) TNO PRIMARY KEY; TNO, CNO CANDIDATE KEYS

Q 24. State any two differences between single row functions and multiple row functions.

[CBSE SQP 2020-21]

Ans. Differences between single row functions and multiple row functions are as follows:

- (i) Single row functions work on one row only whereas multiple row functions work on 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.

Q 25. Consider the decimal number x with value 8459.2654. Write commands in SQL to:

- (i) round it off to a whole number.  
 (ii) round it to 2 places before the decimal.

Ans. (i) `SELECT round(8459.2654);`

(ii) `SELECT round(8459.2654, -2);`

Q 26. Consider the following SQL string: "Preoccupied"

Write commands to display:

(i) "occupied"

(ii) "cup"

[CBSE SQP 2020-21]

Ans. (i) `SELECT substr("Preoccupied", 4);`

Or

`SELECT substring("Preoccupied", 4);`

Or

`SELECT mid("Preoccupied", 4);`

Or

`SELECT right("Preoccupied", 8);`

(ii) `SELECT substr("Preoccupied", 6, 3);`

Or

`SELECT substring("Preoccupied", 6, 3);`

Or

`SELECT mid("Preoccupied", 6, 3);`

Q 27. Considering the same string "Preoccupied"

Write SQL commands to display:

(i) the position of the substring 'cup' in the string "Preoccupied"

(ii) the first 4 letters of the string

[CBSE SQP 2020-21]

Ans. (i) `SELECT instr('Preoccupied', 'cup');`

(ii) `SELECT left('Preoccupied', 4);`

Q 28. Display names 'MR. OBAMA' and 'MS. Gandhi' into lowercase.

Ans. `mysql> SELECT LOWER('MR. OBAMA') AS "LowerName1"`

`-> LOWER('Ms. Gandhi') AS "LowerName2";`

Or

`mysql> SELECT LCASE('MR. OBAMA') AS "LowerName1",`

`-> LCASE('Ms. Gandhi') AS "LowerName2";`

LowerName1	LowerName2
mr. obama	ms. gandhi

1 row in set (0.00 sec)

Q 29. Write a query to remove leading spaces of string 'RDBMS MySQL'.

Ans. `mysql > SELECT LTRIM('RDBMS MySQL');`

ltrim('RDBMS MySQL')
RDBMS MySQL

1 row in set (0.05 sec)

## Knowledge BOOSTER



*LTRIM() removes only the leading spaces. Spaces in the middle or trailing spaces remain untouched with LTRIM().*

Q 30. Write a query to remove leading spaces from string 'Bar One'. Make use of TRIM() function only.

Ans. `mysql> SELECT TRIM(leading ' ' from 'Bar One ')`

TRIM(leading ' ' from 'Bar One ')
Bar One

1 row in set (0.00 sec)



Q 31. Find the output of the following SQL Queries:

- (i) **SELECT ROUND (7658.345,2);**
- (ii) **"SELECT MOD(ROUND (13.9,0),3);**

[CBSE 2022 Term-2]

Ans. (i) ROUND (7658.345,2)

7658.35

(ii) MOD(ROUND(13.9,0),3)

2

Q 32. Give any two differences between the POWER() and SUM() SQL functions. [CBSE 2022 Term-2]

Ans. Power:

- (i) It is used to compute power of given number by specified digit.
- (ii) It accepts two parameters: a number and a power

Sum:

- (i) It is used to do sum of specified numbers or range of numbers
- (ii) It accepts the range of numbers or bunch of values

Q 33. Find the output of the following SQL. queries

- (i) **SELECT SUBSTR("FIT INDIA MOVEMENT",5);**
- (ii) **SELECT INSTR("ARTIFICIAL INTELLIGENCE","IA");**

[CBSE 2022 Term-2]

Ans. (i) SUBSTR("FIT INDIA MOVEMENT",5)

INDIA MOVEMENT

(ii) INSTR("ARTIFICIAL INTELLIGENCE", 'IA')

Q 34. 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.

[CBSE SQP 2023-24]

Ans. (i) **SELECT INSTR ("12#All the Best!", 'the');**

(ii) **SELECT RIGHT ("12#All the Best!", 5);**

Q 35. 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';**

Select sum (bonus) FROM employees.

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

[CBSE 2023]

Ans. **SELECT ZONE, SUM (BONUS) FROM employee where zone = 'WEST';**

Q 36. Srikanth created the following table Student in his database.

Table: Student

Roll No.	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.

[CBSE 2022 Term-2]

Ans. **SELECT COUNT(\*) from Student group by class having COUNT(\*)>3;**

Q 37. Ms. Mohini is working in a school and stores the details of all students in a table SCHOOLDATA.

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.

[CBSE 2022 Term-2]

Ans. (i) **SELECT ltrim (Name) from SCHOOLDATA;**

(ii) **SELECT Name from SCHOOLDATA where dayname (Dob) = 'Sunday';**



Q 38. Ms. Mohini is working in a school and stores the details of all students in a table SCHOOLDATA.

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

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;**

[CBSE 2022 Term-2]

Ans. (i) MAX (Percent)

91

(ii) left (Gender, 1) Name

F Swapnil Pant  
M Rahil Arora



## Short Answer Type-II Questions

Q 1. Explain each of the following with illustrations using a table:

(i) Candidate key (ii) Primary key

(iii) Foreign key

Ans. (i) **Candidate Key:** It refers to any column/attribute that can uniquely identify a record in a table.

(ii) **Primary Key:** It refers to designated attribute(s)/column(s) that uniquely identifies a record in the table: It is one of the candidate keys.

(iii) **Foreign Key:** It is an attribute in a table which is the primary key in linked table.

For example:

Table: ITEMS

GNO	TYPE	COST
G1	Vase	450
G2	Photo Frame	250
G3	Buddha Statue	300
G4	Wall Hanging	200

Primary key

Candidate keys

Table: SALES

CNO	CNAME	
S1	1500	G1
S2	275	G3

Foreign key



TIP

Show key combinations in example for easy clarification of the concept.

Q 2. Write the output produced by the following SQL commands:

(i) **SELECT POW(2, 3) ;**

(ii) **SELECT ROUND (123, 2345, 2), ROUND (342.9234, -1);**

(iii) **SELECT LENGTH ("Informatics Practices");**

(iv) **SELECT YEAR("1979/11/26"), MONTH("1979/11/26"), DAY ("1979/11/26"), MONTHNAME("1979/11/26")**

(v) **SELECT LEFT("INDIA", 3), RIGHT("Computer Science", 4);**

(vi) **SELECT MID("Informatics", 3, 4), SUBSTR("Practices", 3);**

Ans. (i) | 8 |  
(ii) | 123.23 | 340 |  
(iii) | 21 |  
(iv) | 1979 | 11 | 26 | November |  
(v) | IND | ence |  
(vi) | form | actices |

Q 3. A relation Vehicles is given below:

V_no	Type	Company	Price	Qty
AW125	Wagon	Maruti	2,50,000	25
J0083	Jeep	Mahindra	40,00,000	15
S9090	SUV	Mitsubishi	25,00,000	18
M0892	Mini van	Datsun	15,00,000	26
W9760	SUV	Maruti	25,00,000	18
R2409	Mini van	Mahindra	3,50,000	15



Write SQL commands to:

- Display the average price of each type of vehicle having quantity more than 20.
- Count the type of vehicles manufactured by each company.
- Display the total price of all the types of vehicles.

[CBSE SQP 2020-21]

Ans. (i) `SELECT Type, avg(Price) FROM Vehicle GROUP BY Type having Qty>20;`  
 (ii) `SELECT Company, count(distinct Type) FROM Vehicle GROUP BY Company;`  
 (iii) `SELECT Type, sum(Price* Qty) FROM Vehicle GROUP BY Type;`

Q 4. Consider the following table named "GYM" with details about fitness items being sold in the store. Write command of SQL for (i) to (iii).

Table: GYM

ICODE	INAME	PRICE	BRANDNAME
G101	Power Fit Exerciser	20000	Power Gynea
G102	AquaFit Hand Grip	1800	Reliable
G103	Cycle Bike	14000	Ecobike
G104	Protoner Extreme Gym	30000	Coscore
G105	Message Belt	5000	Message Expert
G106	Cross Trainer	13000	GTC Fitness

- To display the names of all the items whose name starts with "A".
- To display ICODEs and INAMEs of all items, whose Brandname is Reliable or Coscore.
- To change the Brandname to "Fit Trend India" of the item, whose ICODE as "G101".

Ans. (i) `SELECT * FROM GYM WHERE INAME LIKE "A%";`  
 (ii) `SELECT ICODE , INAME FROM GYM WHERE BRANDNAME IN ( "Reliable" , "Coscore" );`  
 (iii) `UPDATE GYM SET BRANDNAME = "Fit Trend India " WHERE ICODE = "G101";`

Q 5. Predict the output of the following queries:

- `select instr ('exams@cbse.nic.in', '.');`
- `select substr('exams@cbse.nic.in', 7, 4);`
- `select left('exam@cbse.nic.in', 5);`

[CBSE SQP 2022 Term-2]

Ans. Output:

- 11
- cbse
- exams

Q 6. 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:

- To fetch last 2 characters from the user\_id column.
- 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.

[CBSE SQP 2022 Term-2]

Ans. (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;`

Q 7. Based on the SQL table CAR\_SALES, write suitable queries for the following:

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

- Display fuel wise average sales in the first quarter.
- Display segment wise highest sales in the second quarter.
- Display the records in the descending order of sales in the second quarter.

[CBSE SQP 2023-24]

Ans. (i) `SELECT FUEL, AVG (QT1) FROM CAR_SALES GROUP BY FUEL;`  
 (ii) `SELECT SEGMENT, MAX (QT2) FROM CAR-SALES GROUP BY SEGMENT;`  
 (iii) `SELECT * FROM CAR_SALES ORDER BY QT2 DESC;`

Q 8. Predict the output of the following queries based on the table CAR\_SALES given in Q. 7 above:

- `SELECT LEFT (SEGMENT, 2) FROM CAR_SALES WHERE FUEL="PETROL";`
- `SELECT (QT2-QT1) / 2 "AVG SALE" FROM CAR_SALES WHERE SEGMENT="SUV";`
- `SELECT SUM (QT1) "TOT SALE" FROM CAR_SALES WHERE FUEL="DIESEL";`

[CBSE SQP 2023-24]

Ans. (i) `LEFT (SEGMENT, 2)`  
 Co  
 MU  
 SU  
 Se  
 (ii) `AVG SALE`  
 13500 . 0000  
 6000 . 0000



(iii)	TOT SALE
	67000

Q 9. Reena is working with functions of MySQL. Explain her following:

- What is the purpose of NOW () function?
- How many parameters does it accept?
- What is the general format of its return type?

[CBSE SQP 2022 Term-2]

Ans. (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.

Q 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. [CBSE SQP 2022 Term-2]

Ans. (i) To remove leading space characters: ltrim()  
(ii) To remove trailing space characters: rtrim()  
(iii) To remove both type of space character: trim()

**MySQL Queries:**

Select ltrim ('Hello');

Select rtrim ('Hello');

Select trim ('Hello');

**Output:**

Hello

Q 11. Write MySQL statements for the following:

- To create a database named FOOD.
- To create a table named Nutrients based on the following specification: (CBSE SQP 2023-24)

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

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

Q 12. Write SQL commands for the following on the basis of given table CLUB.

Table: CLUB

COACH_ID	COACHNAME	AGE	SPORTS	DATOFAPP	PAY	SEX
1	KUKREJA	35	KARATE	27/03/1996	1000	M
2	RAVINA	34	KARATE	20/01/1998	1200	F
3	KARAN	34	SQUASH	19/02/1998	2000	M
4	TARUN	33	BASKETBALL	01/01/1998	1500	M
5	ZUBIN	36	SWIMMING	12/01/1998	750	M
6	KETAKI	36	SWIMMING	24/02/1998	800	F

7	ANKITA	39	SQUASH	20/02/1998	2200	F
8	ZAREEN	37	KARATE	22/02/1998	1100	F
9	KUSH	41	SWIMMING	13/01/1998	900	M
10	SHAILYA	37	BASKETBALL	19/02/1998	1700	M

- To show all information about the swimming coaches in the club.
- To list names of all coaches with their date of appointment (DATOFAPP) in descending order.
- To display a report, showing coachname, pay, age and bonus (15% of pay) for all the coaches.

Ans. (i) SELECT \* FROM CLUB  
WHERE SPORTS = "SWIMMING";  
(ii) SELECT COACHNAME FROM CLUB  
ORDER BY DATOFAPP DESC;  
(iii) SELECT COACHNAME, PAY, AGE, PAY \* 0.15 AS Bonus FROM CLUB;

Q 13. Consider the following table FITNESS with details about fitness products being sold in the store. Write command of SQL for (i) to (iii).

Table: FITNESS

PCODE	PNAME	PRICE	Manufacturer
P1	Treadmill	21000	Coscore
P2	Bike	20000	Aone
P3	Cross Trainer	14000	Reliable
P4	Multi Gym	34000	Coscore
P5	Massage Chair	5500	Regrosene
P6	Belly Vibrator Belt	6500	Ambawya

- To display the names of all the products with price more than 20000.
- To display the names of all products by the manufacturer "Aone".
- To change the price data of all the products by applying 25% discount reduction.

Ans. (i) SELECT \* FROM FITNESS  
WHERE PRICE > 20000;  
(ii) SELECT pname FROM FITNESS  
WHERE manufacturer = "Aone";  
(iii) UPDATE FITNESS  
SET PRICE = PRICE \* 0.75 ;

Q 14. Write SQL commands for the following on the basis of given table STUDENT1.

Table: STUDENT1

S.No.	Name	Stipend	Stream	AvgMark	Grade	Class
1	Karan	400.00	Medical	78.5	B	12B
2	Divakar	450.00	Commerce	89.2	A	11C
3	Divya	300.00	Commerce	68.6	C	12C
4	Arun	350.00	Humanities	73.1	B	12C
5	Sabina	500.00	Nonmedical	90.6	A	11A
6	John	400.00	Medical	75.4	B	12B
7	Robert	250.00	Humanities	64.4	C	11A



8	Rublna	450.00	Nonmedical	88.5	A	12A
9	Vikas	500.00	Nonmedical	92.0	A	12A
10	Mohan	300.00	Commerce	67.5	C	12C

- (i) Select all the Non-medical stream students from STUDENT1.  
(ii) List the names of those students who are in class 12 sorted by Stipend.  
(iii) List all students sorted by AvgMark in descending order.

Ans. (i) `SELECT * FROM STUDENT1  
WHERE stream = "nonmedical";`  
(ii) `SELECT name FROM student  
WHERE class LIKE "12%"  
ORDER BY Stipend;`  
(iii) `SELECT * FROM STUDENT1  
ORDER BY AvgMark DESC;`

Q 15. Consider the following table named "GARMENT".  
Write command of SQL for (i) to (iii).

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	Ladies Jacket	XL	Blue	4000.00
115	Trousers	L	Brown	1500.00
116	Ladies Top	L	Pink	1200.00

- (i) To display names of those garments that are available in 'XL' size.  
(ii) To display codes and names of those garments that have their names starting with 'Ladies'.  
(iii) To display garment names, codes and prices of those garments that have price in the range 1000.00 to 1500.00 (both 1000.00 and 1500.00 included).

Ans. (i) `SELECT GNAME  
FROM GARMENT  
WHERE SIZE = 'XL';`  
(ii) `SELECT GCODE, GNAME  
FROM GARMENT  
WHERE GNAME LIKE 'Ladies%';`  
(iii) `SELECT GNAME, GCODE, PRICE  
FROM GARMENT  
WHERE PRICE BETWEEN 1000.00  
AND 1500.00;`

Q 16. Consider the following table named "SOFTDRINK".  
Write command of SQL for (i) to (iii).

Table: SOFTDRINK

DRINKCODE	DNAME	PRICE	CALORIES
101	Lime and Lemon	20.00	120
102	Apple Drink	18.00	120
103	Nature Nectar	15.00	115
104	Green Mango	15.00	140
105	Aam Panna	20.00	135
106	Mango Juice Bahaar	12.00	150

- (i) To display names and drink codes of those drinks that have more than 120 calories.  
(ii) To display drink codes, names and calories of all drinks, in descending order of calories.  
(iii) To display names and price of drinks that have price in the range 12 to 18 (both 12 and 18 included).

Ans. (i) `SELECT DNAME, DRINKCODE  
FROM SOFTDRINK  
WHERE CALORIES > 120;`  
(ii) `SELECT DRINKCODE, DNAME, CALORIES  
FROM SOFTDRINK  
ORDER BY CALORIES DESC;`  
(iii) `SELECT DNAME, PRICE  
FROM SOFTDRINK  
WHERE PRICE BETWEEN 12 and 18;`

Q 17. Given the following table:

Table: CLUB

COACH_ID	COACHNAME	AGE	SPORTS	DATOFAPP	PAY	SEX
1	KUKREJA	35	KARATE	1996-03-27	1000	M
2	RAVINA	34	KARATE	1998-01-20	1200	F
3	KARAN	34	SQUASH	1998-02-19	2000	M
4	TARUN	33	BASKETBALL	1998-01-01	1500	M
5	ZUBIN	36	SWIMMING	1998-01-12	750	M
6	KETAKI	36	SWIMMING	1998-02-24	800	F
7	ANKITA	39	SQUASH	1998-02-20	2200	F
8	ZAREEN	37	KARATE	1998-02-22	1100	F
9	KUSH	41	SWIMMING	1998-01-13	900	M
10	SHAILYA	37	BASKETBALL	1998-02-19	1700	M

Give the output of following SQL statements:

- (i) `SELECT MOD (Age, 5) FROM CLUB WHERE Sex = 'F';`  
(ii) `SELECT POWER(3, 2) FROM CLUB WHERE Sports = 'KARATE';`  
(iii) `SELECT SubStr (CoachName, 1, 2) FROM CLUB  
WHERE Datofapp > '1998-01-31';`

Ans. (i) Output: (ii) Output: (iii) Output:

MOD (Age, 5)	POWER(3, 2)	SubStr (CoachName, 1, 2)
4	9	KE
1	9	AN
2	9	ZA
4		SH

Q 18. Concatenate name and aggregate for students having age as 14 or 16.

Table: STUDENT

Name	Age	Sex	Matric	Aggregate
Abu Bakar	15	M	9531185	456
Aanya	16	F	9531186	340
Gurvinder	14	F	9531187	480
Ali	16	M	9531188	260
Michelle	15	F	9531188	321
Zubln	15	M	9531184	412
Simran	15	F	9531183	378



Fatimah	14	F	9531182	400
Anup	15	M	9531181	302
Mita	16	F	9531180	150

Ans. mysql > SELECT CONCAT (Name, Aggregate)  
AS "Name Marks" FROM STUDENT  
->WHERE age = 14 OR age = 16;

Name Marks
Aanya340
Gurvinder480
Ali260
Fatimah400
Mita150

5 rows in set (0.00 sec)

Q 19. Consider the following tables EMPLOYEE and DEPARTMENT and answer the question.

Table: EMPLOYEE

TCode	TName	DepCde	Salary	Age	JoinDate
15	Sameer Sharma	123	75000	39	01-Apr-2007
21	Ragvinder K	101	86000	29	11-Nov-2005
34	Rama Gupta	119	52500	43	03-Mar-2010
46	CR Menon	103	67000	38	12-Jul-2004
77	Mohan Kumar	103	63000	55	25-Nov-2000
81	Rajesh Kumar	119	74500	48	11-Dec-2008
89	Sanjeev P	101	92600	54	12-Jan-2009
93	Pragya Jain	123	32000	29	05-Aug-2006

Table: DEPARTMENT

DepCde	DepName	DepHead
101	ACCOUNTS	Rajiv Kumar
103	HR	PK Singh
119	IT	Yogesh Kumar
123	RESEARCH	Ajay Dutta

Q 21. 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:

- Display the Breed of all the pets in uppercase.
- Display the total price of all the pets.
- Display the average life span of all the pets.

[CBSE 2022 Term-2]

Ans. (i) select upper (breed) from mypet;  
select upcase (breed) from mypet;  
(ii) select sum (price) from mypet;  
(iii) select avg (lifespan) from mypet;

Give the output of the following SQL queries:

- SELECT COUNT (DISTINCT DepCde) FROM EMPLOYEE;
- SELECT MAX (JoinDate), MIN (JoinDate) FROM EMPLOYEE;
- SELECT TName, DepHead FROM EMPLOYEE E, DEPARTMENT D WHERE E.DepCde = D.DepCde;

Ans. (i)  $\frac{\text{COUNT (DISTINCT DepCde)}}{4}$   
(ii)  $\frac{\text{Max (JoinDate)}}{03 - \text{Mar} - 2010} \frac{\text{Min (JoinDate)}}{12 - \text{Jul} - 2004}$

TName	DepHead
Sameer Sharma	Ajay Dutta
Raguvindra K	Rajiv Kumar
Rama Gupta	Yogesh Kumar
CR Menon	PK Singh
Rajesh Kumar	Yogesh Kumar
Sanjeev P	Rajiv Kumar
Pragya Jain	Ajay Dutta

Q 20. Predict the output of the following SQL queries

- SELECT TRIM ("ALL THE BEST");
- SELECT POWER (5, 2);
- SELECT UPPER(MID("start up india",10));

[CBSE 2022 Term-2]

Ans. (i) trim ("ALL THE BEST")

ALL THE BEST

(ii) POWER (5, 2)

25

(iii) UPPER (MID("start up India" ,10))

INDIA

Q 22. Write the names of SQL functions to perform the following operations:

- Display name of the Month from your date of birth.
- Convert email-id to lowercase.
- Count the number of characters in your name.

[CBSE 2022 Term-2]

Ans. (i) monthname()  
(ii) lower()/lcase  
(iii) length()



Q 23. Consider the following table PRODUCT:

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	5.00	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;` [CBSE 2022 Term-2]

Ans. (i) 10+MOD(QUANTITY,3)

12

(ii) round(price,2)\*quantity

52.50

75.30

(iii) UCASE(RIGHT(PNAME,2))

ER

EN

EN

ER



## Long Answer Type Questions

Q 1. Write SQL commands for the following queries (i) to (v) based on the relations Teacher and Posting given below:

Table: STUDENT

T_ID	Name	Age	Department	Date_of_Join	Salary	Gender
1	Jugal	34	Computer Sc	10/01/2017	12000	M
2	Sharmila	31	History	24/03/2008	20000	F
3	Sandeep	32	Mathematics	12/12/2016	30000	M
4	Sangeeta	35	History	01/07/2015	40000	F
5	Rakesh	42	Mathematics	05/09/2007	25000	M
6	Shyam	50	History	27/06/2008	30000	M
7	Shiv Om	44	Computer Sc	25/02/2017	21000	M
8	Shalakra	33	Mathematics	31/07/2018	20000	F

Table: POSTING

P_ID	Department	Place
1	History	Agra
2	Mathematics	Raipur
3	Computer Science	Delhi

(i) To show all information about the teacher of History department.

(ii) To list the names of female teachers who are in Mathematics department.

(iii) To list the names of all teachers with their date of joining in ascending order.

(iv) To display teacher's name, salary, age for male teachers only.

(v) To display name, bonus for each teacher where bonus is 10% of salary. [CBSE SQP 2020]

Ans. (i) `SELECT * FROM teacher WHERE department = "History";`

(ii) `SELECT name FROM teacher WHERE department = 'Mathematics' AND gender = 'F';`

(iii) `SELECT name FROM teacher ORDER BY date_of_join;`

(iv) `SELECT name, salary, age FROM teacher WHERE gender = 'M';`

(v) `SELECT name, salary * 0.1 AS Bonus FROM teacher;`

Q 2. Consider the following table named "Product", showing details of products being sold in a grocery shop.

Table: Product

PCode	PName	UPrice	Manufacturer
P01	Washing Powder	120	Surf
P02	Toothpaste	54	Colgate
P03	Soap	25	Lux
P04	Toothpaste	65	Pepsodant
P05	Soap	38	Dove
P06	Shampoo	245	Dove

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.

Ans. (i) `CREATE TABLE Product ( PCode CHAR (4) PRIMARY KEY, PName VARCHAR(30) NOT NULL, UPrice FLOAT, Manufacturer VARCHAR (30) );`

(ii) PCode

(iii) `SELECT PCode, PName, UPrice FROM PRODUCT ORDER BY PName desc, UPrice asc ;`

(iv) `ALTER TABLE Product ADD COLUMN Discount Float ;`

(v) `mysql > UPDATE Product  
=> SET Discount = 0.10 *UPrice  
=> WHERE UPrice > 100;`



Q 3. Consider the following table named "Product", showing details of products being sold in a grocery shop.

Table: Product

PCode	PName	UPrice	Manufacturer
P01	Washing Powder	120	Surf
P02	Toothpaste	54	Colgate
P03	Soap	25	Lux
P04	Toothpaste	65	Pepsodant
P05	Soap	38	Dove
P06	Shampoo	245	Dove

- (i) Write SQL query to display the total number of products manufactured by each manufacturer.  
(ii) Write the output(s) produced by executing the following queries on the basis of the information given above in the table Product:  
(a) SELECT PName, Average(UPrice) FROM Product GROUP BY PName;  
(b) SELECT DISTINCT Manufacturer FROM Product;  
(c) SELECT COUNT(DISTINCT PName) FROM Product;  
(d) SELECT PName, MAX(UPrice), MIN(UPrice) FROM Product GROUP BY PName;

Ans. (i) `mysql>SELECT Manufacturer,  
Count(Pcode) FROM Product  
-> GROUP BY Manufacturer;`

Manufacturer	Count (Pcode)
Surf	1
Colgate	1
Lux	1
Pepsodant	1
Dove	2

(ii) (a)

PName	Avg (UPrice)
Washing Powder	120
Toothpaste	59.5
Soap	33.78000068664551
Shampoo	274.3999938964844

(b)

Manufacturer
Surf
Colgate
Lux
Pepsodant
Dove

(c)

COUNT (DISTINCT PName)
4

(d)

PName	MAX (UPrice)	MIN (UPrice)
Washing Powder	120	120
Toothpaste	65	54
Soap	42.96	25
Shampoo	274.4	274.4

Q 4. Carefully observe the following table named 'stock':

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:

- (i) To display the records in decreasing order of price.  
(ii) To display category and category wise total quantities of products.  
(iii) To display the category and its average price.  
(iv) To display category and category wise highest price of the products. [CBSE SQP 2022 Term-2]

Ans. (i) `select * from stock order by price desc;`  
(ii) `select category, sum(qty) from stock group by category;`  
(iii) `select category, avg(price) from stock group by category;`  
(iv) `select category, max(price) from stock group by category;`

Q 5. 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	rtr4%	2021-05-15
6	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. [CBSE SQP 2023-24]

Ans. (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;`



Q 6. Satyam, a database analyst has created the following table:

Table: Student

Reg No.	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:

- Select sum (MARKS) from student where OPTIONAL='IP' and STREAM='Commerce';
- Select max (MARKS)+min(MARKS) from student where OPTIONAL='CS';
- Select avg (MARKS) from student where OPTIONAL='IP';
- Select length (SNAME) from student where MARKS is NULL;

Help him in predicting the output of the above given queries.

[CBSE SQP 2022 Term-2]

Ans. Output:

- 193
- 194
- 93.75
- 6

Q 7. 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. [CBSE SQP 2022 Term-2]

Ans. 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.

Q 8. 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).

Table: Student

AdmNo	Name	Stcode
211	Jay	NULL
241	Aditya	S03
290	Diksha	S01

333	Jasqueen	S02
356	Vedika	S01
380	Ashpreet	S03

Table: STREAM

StCode	Stream
S01	Science
S02	Commerce
S03	Humanities

Write SQL queries for the following:

- Create the database Streams\_of\_Students.
- Create the table Student by choosing appropriate data types based on the data given in the table.
- Identify the primary keys from tables Student and Stream. Also, identify the foreign key from the table Stream.
- Jay has now changed his stream to humanities. Write an appropriate SQL query to reflect this change.
- Display the names of students whose names end with the character 'a'. Also, arrange the students in alphabetical order.

Ans. (i) `mysql > CREATE DATABASE Streams_of_Students;`



## TiP

Before attempting the following questions, we opened the database created above by giving command as:

`mysql> USE Streams_of_Students;`

(ii) Creating Stream table with data:

```
CREATE TABLE Stream (StCode char(4)
primary key, Stream varchar (30));
INSERT INTO Stream VALUES ('S01',
'Science');
INSERT INTO Stream VALUES ('S02',
'Commerce');
INSERT INTO Stream VALUES ('S03',
'Humanities');
```

Creating Student table with data:

```
mysql > CREATE TABLE Student (AdmNo int
primary key, Name varchar(25),
StCode char(4) references Stream(StCode)
);
INSERT INTO Student VALUES (211, 'Jay',
NULL);
INSERT INTO Student VALUES (241, 'Aditya',
'S03');
INSERT INTO Student VALUES (290, 'Diksha', 'S01');
INSERT INTO Student VALUES (333, 'Jasqueen',
'S02');
INSERT INTO Student VALUES (356, 'Vedika',
'S01');
INSERT INTO Student VALUES (380, 'Ashpreet',
'S03');
```



(iii)

Table	Primary key	Foreign key
Student	AdmNo	StCode
Stream	StCode	No foreign key

(iv) Since StCode of Humanities is S03, we can update Student table as:

```
mysql> UPDATE Student  
- > SET StCode = 'S03'  
- > WHERE name = 'Jay';
```

(v) mysql> SELECT \* FROM student  
- > WHERE name LIKE '%a'  
- > ORDER BY name ;

AdmNo	Name	StCode
241	Aditya	S03
290	Diksha	S01
356	Vedika	S01

Q 9. Write suitable SQL queries for the following:

- To calculate the exponent for 3 raised to the power of 4.
- To display current date and time.
- To round off the value -34.4567 to 2 decimal places.
- To remove all the probable leading and trailing spaces from the column userid of the table named user.
- To display the length of the string 'FIFA World Cup'. [CBSE SQP 2023-24]

Ans. (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') ;

Q 10. Consider the table: ITEM

S. No.	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 queries for the following:

- Display all the records in descending order of Stockdate.
- Display the type and total number of Items of each Type.
- Display the least Price.
- Display the Itemname with their price rounded to 1 decimal place. [CBSE 2022 Term-2]

Ans. (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;

Q 11. Kabir has created following table named exam:

Table: Exam

Reg No.	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 perform the following task:

- Insert a new record in the table having following values:  
[6, 'Khushi', 'CS', 85]
- To change the value "IP" to "Informatics Practices" in subject column.
- To remove the records of those students whose marks are less than 30.
- To add a new column Grade of suitable datatype.
- To display records of "Informatics Practices" subject. [CBSE SQP 2023-24]

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"

Q 12. Write the SQL queries which will perform the following operations:

- To display the year from your Date of Admission which is '2023-05-15'
- To convert your email Id 'ABC@XYZ.com' to lowercase.
- To remove leading spaces from a string 'my country'.
- To display current date.
- To display the value of  $10^6$ . [CBSE 2023]

Ans. (i) SELECT YEAR ('2023/05/15') AS YEAR;  
(ii) SELECT LOWER ('ABC@XYZ.com');  
(iii) SELECT LTRIM ('my country');  
(iv) SELECT GETDATE ( ) ;  
(v) SELECT POWER (10, 6);

Q 13. Consider the following table:

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;` [CBSE 2022 Term-2]

Ans. (i) `MAX(Qtysold) min(Qtysold)`

280 68

(ii) `count(Area)`

5

(iii) `length(sname)`

4

5

(iv) `sname`

Ankit

Q 14. Based on the given table SALESMAN write SQL queries to perform the following operations:

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

(i) Display the maximum qty sold from each area.

(ii) Count the total number of salesman.

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

(iv) Display all the records in ascending order of area. [CBSE 2022 Term-2]

Ans. (i) `select area, max (Qtysold) from salesman group by area;`

(ii) `select count (°) from salesman;`

(iii) `select avg (qty sold) from salesman group by area having count (°)>1;`

(iv) `select ° from salesman order by area;`

Q 15. Consider a table PRODUCT with the following data:

Table: PRODUCT

S. No.	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'. [CBSE 2023]

Ans. (i) `SELECT SUBSTRING (Itemname, 1, 3) FROM PRODUCT;`

(ii) `SELECT Itemname FROM PRODUCT WHERE stockdate = 'Monday';`

(iii) `SELECT SUM (Price) FROM PRODUCT;`

(iv) `SELECT MAX (PRICE) FROM PRODUCT;`

(v) `SELECT AVG (PRICE) FROM PRODUCT WHERE Company = 'Logitech';`



## Chapter Test

### Multiple Choice Questions

Q 1. The SQL keyword ..... is used to specify the table(s) that contains the data to be retrieved.

- a. FROM
- b. CONTENT
- c. RETRIEVE
- d. SELECT

Q 2. To remove duplicate rows from the result of a query, specify the SQL qualifier ..... in select list.

- a. FROM
- b. DISTINCT
- c. WHERE
- d. SELECT

Q 3. To obtain all columns, use a(n) ..... instead of listing all the column names in the select list.

- a. &
- b. Dollar(\$)
- c. Hash(#)
- d. Asterisk (\*)

Q 4. The SQL ..... clause contains the condition that specifies which rows are to be selected.

- a. FROM
- b. DISTINCT
- c. WHERE
- d. SELECT



Q 5. When two conditions must both be true for the rows to be selected, the conditions are separated by the SQL keyword .....

- a. FROM                      b. SELECT  
c. OR                         d. AND

### Fill in the Blanks

Q 6. The ..... command can be used to make changes in the rows of a table in SQL. [CBSE SQP 2020-21]

Q 7. The functions that work with one row at a time are called ..... functions.

Q 8. To get a substring of a string, other than Substr( ), function ..... is also used.

### Assertion & Reason Type Questions

**Directions (Q. Nos. 9-11):** In the questions given below, there are two statements marked as Assertion (A) and Reason (R). Read the statements and choose the correct option.

- 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 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.

Q 9. Assertion (A): The MODIFY TABLE command is used to change definitions of existing tables. Usually, it is used to add columns to a table. Sometimes it is used to delete columns (depending on privileges) or change their sizes.

Reason (R): To delete some data from tables, you can use SQL DELETE commands. The DELETE command removes rows from a table. This removes the entire rows, not individual filed values, so no filed argument is needed or accepted.

Q 10. Assertion (A): A function is a set of pre-defined commands that performs specific operation and returns a single values.

Reason (R): The functions used in SQL can be categorised into two categories namely single row or scalar functions and multiple row or group or aggregate functions.

Q 11. Assertion (A): The NULL value in a column can be searched for in a table using IS NULL in the WHERE clause. (Relational operators like =, <>, etc. can't be used with NULL).

Reason (R): When a constraint is to be applied on a group of columns of the table, it is called column constraint.

### Case Study Based Questions

Q 12. A Gift Gallery has different stores in India. Database Administrator Abhay wants to maintain database of their Salesman 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

(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");

(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";



(iv) The command to display the name of the salesman along with the sales amount rounded off to one decimal point will be:

- `SELECT sname, round(sales, 1) FROM salesman;`
- `SELECT sname, round(sales, 0.1) FROM salesman;`
- `SELECT sname, trunc(sales, 1) FROM salesman;`
- `SELECT sname, trunc(sales, 0.1) 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)	b.	Right (Sname, 3)	Round (Sales)
	Pri	3450		iya	3450
	Shi	8000		shi	8000
c.	Right (Sname, 3)	Round (Sales)	d.	Right (Sname, 3)	Round (Sales)
	iya	3450		Pri	3450
	shi	8001		Pri	8001

Q 13. Write SQL queries for (i) to (iv) and find outputs for SQL queries (v) which are based on the tables TRANSPORT and TRIP:

Table: TRANSPORT

TCODE	TTYPE	PERKM
103	ORDINARY BUS	90
105	SUV	40
104	CAR	20
103	ORDINARY BUS	90
101	VOLVO BUS	160
102	AC DELUXE BUS	140

Table: TRIP

NO	NAME	TDATE	KM	TCODE	NOP
11	TANISH KHAN	2015-12-13	200	101	32
13	DANISH SAHAI	2016-06-21	100	103	45
15	RAM KUMAR	2016-02-23	350	102	42
12	FEN SHEN	2016-01-13	90	102	40
17	AAN KUMAR	2015-02-10	75	104	2
14	VEENA	2016-06-28	80	105	4
16	RAJPAL KIRTI	2016-06-06	200	101	25

Note:

- NO is Driver Number
- KM is Kilometer travelled
- NOP is number of travellers travelled in vehicle
- TDATE is Trip Date

(i) To display NO, NAME, TDATE from the table TRIP in descending order of NO.

(ii) To display the NAME of the drivers from the table TRIP who are traveling by transport vehicle with code 101 or 103.

(iii) To display the NO and NAME of those drivers from the table TRIP who travelled between '2015-02-10' and '2015-04-01'.

(iv) To display all the details from table TRIP in which the distance travelled is more than 100 KM in ascending order of NOP.

(v) `SELECT COUNT (*), TCODE From TRIP  
GROUP BY TCODE HAVING COUNT (*) > 1;`

### Very Short Answer Type Questions

Q 14. Write a query to create a string from the ASCII values 70, 65, 67, 69.

Q 15. Display 4 characters extracted from 3rd left character onwards from string 'ABCDEFGH'.

Q 16. Display first three characters extracted from jobs of employees 8888 and 8900.

### Short Answer Type-I Questions

Q 17. Write a query to remove both leading and trailing x characters from string 'xxxx Bar One xxxxx'.

Q 18. Display the employee names and the name-lengths for employees 8888 and 8900.

### Short Answer Type-II Questions

Q 19. Consider the following tables WORKER and PAYLEVEL and answer the question:

Table: WORKER

ECODE	NAME	DESIGN	PLEVEL	DOJ	DOB
11	Radhe Shyam	Supervisor	P001	13-Sep-2004	23-Aug-1981
12	Chander Nath	Operator	P003	22-Feb-2010	12-Jul-1987
13	Flizza	Operator	P003	14-Jun-2009	14-Oct-1983
15	Ameen Ahmed	Mechanic	P002	21-Aug-2006	13-Mar-1984
18	Sanya	Clerk	P002	19-Dec-2005	09-Jan-1983

Table: PAYLEVEL

PLEVEL	PAY	ALLOWANCE
P001	26000	12000
P002	22000	10000
P003	12000	6000

Give the output of following SQL queries:

(i) `SELECT COUNT (PLEVEL), PLEVEL FROM  
WORKER GROUP BY PLEVEL;`

(ii) `SELECT MAX(DOB), MIN(DOJ) FROM WORKER;  
SELECT Name,PAY FROM WORKER`

(iii) `W,PAYLEVEL P WHERE W.LEVEL=`  
`P.PLEVEL AND W.ECODE<13;`



Q 20. Consider the following tables EMPLOYEE and SALGRADE and answer the questions:

Table: EMPLOYEE

ECODE	NAME	DESIGN	SGRADE	DOJ	DOB
101	Abdul Ahmad	Executive	S03	23-Mar-2003	13-Jan-1980
102	Ravi Chander	Head-IT	S02	12-Feb-2010	22-Jul-1987
103	John Ken	Receptionist	S03	24-Jun-2009	24-Feb-1983
105	Nazar Ameen	GM	S02	11-Aug-2006	03-Mar-1984
108	Priyam Sen	CEO	S01	29-Dec-2004	19-Jan-1982

Table: SALGRADE

SGRADE	SALARY	HRA
S01	56000	18000
S02	32000	12000
S03	24000	8000

Give the output of the following SQL queries:

- SELECT COUNT(SGRADE), SGRADE  
FROM EMPLOYEE GROUP BY SGRADE;
- SELECT MIN(DOB), MAX(DOJ) FROM EMPLOYEE;
- SELECT NAME, SALARY FROM EMPLOYEE E,  
SAL-GRADE S WHERE  
E.SGRADE = S.SGRADE AND E.ECODE<103';

### Long Answer Type Questions

Q 21. Write the SQL functions which will perform the following operations:

- To display the name of the month of the current date .
- To remove spaces from the beginning and end of a string, "Panorama".

- To display the name of the day, example, Friday or Sunday from your date of birth, dob.
- To display the starting position of your first name (fname) from your whole name (name).
- To compute the remainder of division between two numbers, n1 and n2. [CBSE SQP 2020-21]

Q 22. Consider a table SALESMAN with the following data:

S.NO.	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:

- Display salesman name and bonus after rounding off to zero decimal places.
- Display the position of occurrence of the string "ta" in salesman names.
- Display the four characters from salesman name starting from second character.
- Display the month name for the date of join of salesman.
- Display the name of the weekday for the date of join of salesman. [CBSE SQP 2020-21]