1. What is SQL?

* SQL stands for Structured Query Language. It is a language used to interact with the database, i.e to create a database, to create a table in the database, to retrieve data or update a table in the database, etc.
* Using SQL, we can do many things. For example – we can execute queries, we can insert records into a table, can update records, can create a database, can create a table, can delete a table, etc.

1. Does SQL support programming language features?

* It is true that SQL is a language, but it does not support programming as it is not a programming language, it is a command language. We do not have conditional statements in SQL like for loops or if..else, we only have commands which we can use to query, update, delete, etc. data in the database. SQL allows us to manipulate data in a database.

1. What is the difference between CHAR and VARCHAR2 datatype in SQL?

* Both of these data types are used for characters, but varchar2 is used for character strings of variable length, whereas char is used for character strings of fixed length. For example, if we specify the type as char(5) then we will not be allowed to store a string of any other length in this variable, but if we specify the type of this variable as varchar2(5) then we will be allowed to store strings of variable length. We can store a string of length 3 or 4 or 2 in this variable.

1. What do you mean by data definition language?

* Data definition language or DDL allows to execution of queries like CREATE, DROP, and ALTER. That is those queries that define the data.

1. What do you mean by data manipulation language?

* Data manipulation Language or DML is used to access or manipulate data in the database. It allows us to perform the below-listed functions:
  + Insert data or rows in a database
  + Delete data from the database
  + Retrieve or fetch data
  + Update data in a database.

1. What is the view in SQL?

* Views in SQL are a kind of virtual table. A view also has rows and columns as they are on a real table in the database. We can create a view by selecting fields from one or more tables present in the database. A View can either have all the rows of a table or specific rows based on certain conditions.
* The CREATE VIEW statement of SQL is used for creating views.
* Basic Syntax:

CREATE VIEW view\_name AS

SELECT column1, column2.....

FROM table\_name

WHERE condition;

1. What do you mean by foreign key?

* A Foreign key is a field that can uniquely identify each row in another table. And this constraint is used to specify a field as a Foreign key. That is this field points to the primary key of another table. This usually creates a kind of link between the two tables.

1. What are table and Field?

* Table: A table has a combination of rows and columns. Rows are called records and columns are called fields. In MS SQL Server, the tables are being designated within the database and schema names.
* Field: In DBMS, a database field can be defined as a single piece of information from a record.

1. What is the primary key?

* A Primary Key is one of the candidate keys. One of the candidate keys is selected as the most important and becomes the primary key. There cannot be more than one primary key in a table.

1. What is a Default constraint?

* The DEFAULT constraint is used to fill a column with default and fixed values. The value will be added to all new records when no other value is provided.

1. What is a query?

* An **SQL** query is used to retrieve the required data from the database. However, there may be multiple SQL queries that yield the same results but with different levels of efficiency.

1. What is a subquery?

* a Subquery can be simply defined as a query within another query. In other words, we can say that a Subquery is a query that is embedded in the WHERE clause of another SQL query.

1. What are the different operators available in SQL?

* There are three operators available in SQL namely:
  + Arithmetic Operators
  + Logical Operators
  + Comparison Operators

1. What is a Constraint?

* Constraints are the rules that we can apply to the type of data in a table. That is, we can specify the limit on the type of data that can be stored in a particular column in a table using constraints.

1. What is Data Integrity?

* Data integrity is defined as the data contained in the database being both correct and consistent. For this purpose, the data stored in the database must satisfy certain types of procedures (rules). The data in a database must be correct and consistent. So, data stored in the database must satisfy certain types of procedures (rules). DBMS provides different ways to implement such types of constraints (rules). This improves data integrity in a database.

1. What is Auto Increment?

* Sometimes, while creating a table, we do not have a unique identifier within the table, hence we face difficulty in choosing Primary Key. So as to resolve such an issue, we’ve to manually provide unique keys to every record, but this is often also a tedious task. So we can use the Auto-Increment feature that automatically generates a numerical Primary key value for every new record inserted.

1. What is MySQL collation?

* A MySQL collation is a well-defined set of rules which are used to compare characters of a particular character set by using their corresponding encoding. Each character set in MySQL might have more than one collation, and has, at least, one default collation. Two character sets cannot have the same collation.

1. What are user-defined functions?

* SQL functions and User-defined functions can appear anywhere, that is, wherever an expression occurs.
* For example, it can be used in:
  + Select a list of SELECT statements.
  + Condition of the WHERE clause.
  + CONNECT BY, ORDER BY, START WITH, and GROUP BY
  + The VALUES clause of the INSERT statement.
  + The SET clause of the UPDATE statement.

1. What is a stored procedure?

* Stored Procedures are created to perform one or more DML operations on databases. It is nothing but a group of SQL statements that accepts some input in the form of parameters and performs some task and may or may not return a value.

1. What are aggregate and scalar functions?

* For doing operations on data SQL has many built-in functions, they are categorized into two categories and further sub-categorized into seven different functions under each category. The categories are:
  + Aggregate functions: These functions are used to do operations from the values of the column and a single value is returned.
  + Scalar functions: These functions are based on user input, these too return a single value.

1. What is an ALIAS command?

* Aliases are the temporary names given to a table or column for the purpose of a particular SQL query. It is used when the name of a column or table is used other than its original name, but the modified name is only temporary.
  + Aliases are created to make table or column names more readable.
  + The renaming is just a temporary change and the table name does not change in the original database.
  + Aliases are useful when table or column names are big or not very readable.
  + These are preferred when there is more than one table involved in a query.

1. What are Union, minus, and Interact commands?

* Set Operations in SQL eliminate duplicate tuples and can be applied only to the relations which are union compatible.
* UNION Operation: This operation includes all the tuples which are present in either of the relations.
* INTERSECT Operation: This operation includes the tuples which are present in both of the relations.
* EXCEPT for Operation: This operation includes tuples that are present in one relationship but should not be present in another relationship.

1. How to copy tables in SQL?

* Sometimes, in SQL, we need to create an exact copy of an already defined (or created) table. MySQL enables you to perform this operation. Because we may need such duplicate tables for testing the data without having any impact on the original table and the data stored in it.
* CREATE TABLE Contact List(Clone\_1) LIKE Original\_table;

1. Can we disable a trigger? If yes, how?

* Yes, we can disable a trigger in PL/SQL. If consider temporarily disabling a trigger and one of the following conditions is true:
  + An object that the trigger references is not available.
  + We must perform a large data load and want it to proceed quickly without firing triggers.
  + We are loading data into the table to which the trigger applies.
  + We disable a trigger using the ALTER TRIGGER statement with the DISABLE option.
  + We can disable all triggers associated with a table at the same time using the ALTER TABLE statement with the DISABLE ALL TRIGGERS option.

1. What is the difference between BETWEEN and IN operators in SQL?

* BETWEEN: The BETWEEN operator is used to fetch rows based on a range of values.
* IN: The IN operator is used to check for values contained in specific sets.

1. What is the difference between primary key and unique constraints?

* The primary key cannot have NULL values, the unique constraints can have NULL values. There is only one primary key in a table, but there can be multiple unique constraints. The primary key creates the clustered index automatically but the unique key does not.

1. What is a join in SQL? What are the types of joins?

* An SQL Join statement is used to combine data or rows from two or more tables based on a common field between them. Different types of Joins are:
  + INNER JOIN: The INNER JOIN keyword selects all rows from both tables as long as the condition is satisfied. This keyword will create the result set by combining all rows from both the tables where the condition satisfies i.e. the value of the common field will be the same.
  + LEFT JOIN: This join returns all the rows of the table on the left side of the join and matching rows for the table on the right side of the join. For the rows for which there is no matching row on the right side, the result set will be null. LEFT JOIN is also known as LEFT OUTER JOIN
  + RIGHT JOIN: RIGHT JOIN is similar to LEFT JOIN. This join returns all the rows of the table on the right side of the join and matching rows for the table on the left side of the join. For the rows for which there is no matching row on the left side, the result set will contain null. RIGHT JOIN is also known as RIGHT OUTER JOIN.
  + FULL JOIN: FULL JOIN creates the result set by combining the results of both LEFT JOIN and RIGHT JOIN. The result set will contain all the rows from both tables. For the rows for which there is no matching, the result set will contain NULL values.

1. What is the On Delete cascade constraint?

* An ‘ON DELETE CASCADE’ constraint is used in MySQL to delete the rows from the child table automatically when the rows from the parent table are deleted.

1. Explain WITH clause in SQL?

* The WITH clause provides a way relationship of defining a temporary relationship whose definition is available only to the query in which the with clause occurs. SQL applies predicates in the WITH clause after groups have been formed, so aggregate functions may be used.

1. Write down various types of relationships in SQL?

* One-to-One Relationship.
* One to Many Relationships.
* Many to One Relationship.
* Self-Referencing Relationship.

1. What is a trigger?

* The trigger is a statement that a system executes automatically when there is any modification to the database. In a trigger, we first specify when the trigger is to be executed and then the action to be performed when the trigger executes. Triggers are used to specify certain integrity constraints and referential constraints that cannot be specified using the constraint mechanism of SQL.

1. What is the difference between SQL DELETE and SQL TRUNCATE commands?

* The DELETE statement removes rows one at a time and records an entry in the transaction log for each deleted row.
* TRUNCATE TABLE removes the data by deallocating the data pages used to store the table data and records only the page deallocations in the transaction log.

1. What is Case WHEN in SQL?

* In SQL, CASE WHEN is used to create conditional logic, similar to "if-else" statements in programming. It helps you check different conditions and return specific values based on whether the conditions are true or false.
* CASE case\_value WHEN when\_value THEN statement\_list [WHEN when\_value THEN statement\_list] … [ELSE statement\_list]END CASE

1. Name different types of case manipulation functions available in SQL.

* LOWER: The purpose of this function is to return the string in lowercase. It takes a string as an argument and returns the string by converting it into lower case.
* UPPER: The purpose of this function is to return the string in uppercase. It takes a string as an argument and returns the string by converting it into uppercase.
* INITCAP: The purpose of this function is to return the string with the first letter in uppercase and the rest of the letters in lowercase.

1. What is the difference between TRUNCATE and DROP statements?

* The DROP command is used to remove the table definition and its contents.
* Whereas the TRUNCATE command is used to delete all the rows from the table.

1. Which operator is used in queries for pattern matching?

* LIKE operator: It is used to fetch filtered data by searching for a particular pattern in the where clause.
* SELECT column1,column2 FROM table\_name WHERE column\_name LIKE pattern;

1. Define SQL Order by the statement?

* The ORDER BY statement in SQL is used to sort the fetched data in either ascending or descending according to one or more columns.
* By default ORDER BY sorts the data in ascending order.
* We can use the keyword DESC to sort the data in descending order and the keyword ASC to sort in ascending order.

1. Explain SQL Having statement?

* HAVING is used to specify a condition for a group or an aggregate function used in the select statement. The WHERE clause selects before grouping. The HAVING clause selects rows after grouping. Unlike the HAVING clause, the WHERE clause cannot contain aggregate functions.

1. Explain SQL AND OR statement with an example?

* In SQL, the AND & OR operators are used for filtering the data and getting precise results based on conditions. The AND and OR operators are used with the WHERE clause.
* These two operators are called conjunctive operators.
  + AND Operator: This operator displays only those records where both conditions condition 1 and condition 2 evaluate to True.
  + OR Operator: This operator displays the records where either one of the conditions condition 1 and condition 2 evaluates to True. That is, either condition1 is True or condition2 is True.

1. Define BETWEEN statements in SQL?

* The SQL BETWEEN condition allows you to easily test if an expression is within a range of values (inclusive). The values can be text, date, or numbers. It can be used in a SELECT, INSERT, UPDATE, or DELETE statement. The SQL BETWEEN Condition will return the records where the expression is within the range of value1 and value2.

1. Why do we use Commit and Rollback commands?

* COMMIT permanently saves the changes made by the current transaction. ROLLBACK undo the changes made by the current transaction.
* The transaction can not undo changes after COMMIT execution. Transaction reaches its previous state after ROLLBACK.
* When the transaction is successful, COMMIT is applied. When the transaction is aborted, ROLLBACK occurs.

1. What are ACID properties?

* A transaction is a single logical unit of work that accesses and possibly modifies the contents of a database. Transactions access data using read-and-write operations. In order to maintain consistency in a database, before and after the transaction, certain properties are followed. These are called ACID properties. ACID (Atomicity, Consistency, Isolation, Durability) is a set of properties that guarantee that database transactions are processed reliably.

1. Are NULL values the same as zero or a blank space?

* In SQL, zero or blank space can be compared with another zero or blank space. whereas one null may not be equal to another null. null means data might not be provided or there is no data.

1. What is the need for group functions in SQL?

* In database management, group functions, also known as aggregate functions, is a function where the values of multiple rows are grouped together as input on certain criteria to form a single value of more significant meaning.
  + Count()
  + Sum()
  + Avg()
  + Min()
  + Max()

1. What is the need for a MERGE statement?

* The MERGE command in SQL is actually a combination of three SQL statements: INSERT, UPDATE, and DELETE. In simple words, the MERGE statement in SQL provides a convenient way to perform all these three operations together which can be very helpful when it comes to handling large running databases. But unlike INSERT, UPDATE, and DELETE statements MERGE statement requires a source table to perform these operations on the required table which is called a target table.

1. What are the advantages of PL/SQL functions?

* We can make a single call to the database to run a block of statements. Thus, it improves the performance against running SQL multiple times. This will reduce the number of calls between the database and the application.
* We can divide the overall work into small modules which becomes quite manageable, also enhancing the readability of the code.
* It promotes reusability.
* It is secure since the code stays inside the database, thus hiding internal database details from the application(user). The user only makes a call to the PL/SQL functions. Hence, security and data hiding is ensured.

1. What is the SQL query to display the current date?

* CURRENT\_DATE returns to the current date. This function returns the same value if it is executed more than once in a single statement, which means that the value is fixed, even if there is a long delay between fetching rows in a cursor.

1. What are Nested Triggers?

* A trigger can also contain INSERT, UPDATE, and DELETE logic within itself, so when the trigger is fired because of data modification it can also cause another data modification, thereby firing another trigger. A trigger that contains data modification logic within itself is called a nested trigger.

1. What is the difference between COALESCE() & ISNULL()?

* COALESCE(): COALESCE function in SQL returns the first non-NULL expression among its arguments. If all the expressions evaluate to null, then the COALESCE function will return null.
* ISNULL(): The ISNULL function has different uses in SQL Server and MySQL. In SQL Server, ISNULL() function is used to replace NULL values.

1. What are the different subsets of SQL?

* Data Definition Language (DDL) – It allows you to perform various operations on the database such as CREATE, ALTER, and DELETE objects.
* Data Manipulation Language(DML) – It allows you to access and manipulate data. It helps you to insert, update, delete and retrieve data from the database.
* Data Control Language(DCL) – It allows you to control access to the database. Example – Grant and Revoke access permissions.

1. What is a Self-Join?

* Self-join is a type of join that can be used to connect two tables. As a result, it is a unary relationship. Each row of the table is attached to itself and all other rows of the same table in a self-join. As a result, self-joining is mostly used to combine and compare rows from the same database table.

1. What are some common clauses used with SELECT query in SQL?

* WHERE clause: In SQL, the WHERE clause is used to filter records that are required depending on certain criteria.
* ORDER BY clause: The ORDER BY clause in SQL is used to sort data in ascending (ASC) or descending (DESC) order depending on specified field(s) (DESC).
* GROUP BY clause: GROUP BY clause in SQL is used to group entries with identical data and may be used with aggregation methods to obtain summarised database results.
* HAVING clause in SQL is used to filter records in combination with the GROUP BY clause. It is different from WHERE, since the WHERE clause cannot filter aggregated records.

1. What is Cursor? How to use a Cursor?

* After any variable declaration, DECLARE a cursor. A SELECT Statement must always be coupled with the cursor definition.
* To start the result set, move the cursor over it. Before obtaining rows from the result set, the OPEN statement must be executed.
* To retrieve it and go to the next row in the result set, use the FETCH command.
* To disable the cursor, use the CLOSE command.
* Finally, use the DEALLOCATE command to remove the cursor definition and free up the resources connected to it.

1. Explain character-manipulation functions? Explains its different types in SQL.

* Change, extract, and edit the character string using character manipulation routines. The function will do its action on the input strings and return the result when one or more characters and words are supplied into it.
* The character manipulation functions in SQL are as follows:
  + CONCAT (joining two or more values): This function is used to join two or more values together. The second string is always appended to the end of the first string.
  + SUBSTR: This function returns a segment of a string from a given start point to a given endpoint.
  + LENGTH: This function returns the length of the string in numerical form, including blank spaces.
  + INSTR: This function calculates the precise numeric location of a character or word in a string.
  + LPAD: For right-justified values, it returns the padding of the left-side character value.
  + RPAD: For a left-justified value, it returns the padding of the right-side character value.
  + TRIM: This function removes all defined characters from the beginning, end, or both ends of a string. It also reduced the amount of wasted space.
  + REPLACE: This function replaces all instances of a word or a section of a string (substring) with the other string value specified.

1. What is the difference between the RANK() and DENSE\_RANK() functions?

* The RANK() function in the result set defines the rank of each row within your ordered partition. If both rows have the same rank, the next number in the ranking will be the previous rank plus a number of duplicates.
* The DENSE\_RANK() function assigns a distinct rank to each row within a partition based on the provided column value, with no gaps. It always indicates a ranking in order of precedence. This function will assign the same rank to the two rows if they have the same rank, with the next rank being the next consecutive number.

1. What is the difference between NOW() and CURRENT\_DATE()?

* NOW() returns a constant time that indicates the time at which the statement began to execute. (Within a stored function or trigger, NOW() returns the time at which the function or triggering statement began to execute.
* The simple difference between NOW() and CURRENT\_DATE() is that NOW() will fetch the current date and time both in format ‘YYYY-MM\_DD HH:MM:SS’ while CURRENT\_DATE() will fetch the date of the current day ‘YYYY-MM\_DD’.

1. What is BLOB and TEXT in MySQL?

* BLOB stands for Binary Huge Objects and can be used to store binary data, whereas TEXT may be used to store a large number of strings. BLOB may be used to store binary data, which includes images, movies, audio, and applications.
* BLOB values function similarly to byte strings, and they lack a character set. As a result, bytes’ numeric values are completely dependent on comparison and sorting.
* TEXT values behave similarly to a character string or a non-binary string. The comparison/sorting of TEXT is completely dependent on the character set collection.

1. What are Entities and Relationships?

* Entities: A person, place, or thing in the real world about which data can be stored in a database. Tables store data that represents one type of entity. For example – A bank database has a customer table to store customer information. The customer table stores this information as a set of attributes (columns within the table) for each customer.
* Relationships: Relation or links between entities that have something to do with each other. For example – The customer’s name is related to the customer account number and contact information, which might be in the same table. There can also be relationships between separate tables (for example, customer to accounts).

1. What is the difference between cross join and natural join?

* The cross join produces the cross product or Cartesian product of two tables whereas the natural join is based on all the columns having the same name and data types in both the tables.

1. What are the different types of a subquery?

* Correlated subquery: These are queries which select the data from a table referenced in the outer query. This is not considered an independent query as it refers to another table and refers to the column in a table.
* Non-Correlated subquery: This query is an independent query where the output of subquery is substituted in the main query.

1. What is the difference between ‘HAVING’ CLAUSE and a “where” clause?

* HAVING clause can only be used only with SELECT statement. It is usually used in a GROUP BY clause and whenever GROUP BY is not used, HAVING behaves like a WHERE clause.
* Having Clause is only used with the GROUP BY function in a query whereas WHERE Clause is applied to each row before they are a part of the GROUP BY function in a query.