Viva Question Bank

1. What is DBMS ?

The database management system is a collection of programs that enables user to store, retrieve, update and delete information from a database.

2. What is RDBMS ?

Relational Database Management system (RDBMS) is a database management system (DBMS) that is based on the relational model. Data from relational database can be accessed or reassembled in many different ways without having to reorganize the database tables. Data from relational database can be accessed using an API , Structured Query Language (SQL).

3. What is SQL ?

Structured Query Language(SQL) is a language designed specifically for communicating with databases. SQL is an ANSI (American National Standards Institute) standard.

4. What are the different type of SQL's statements ?

This is one of the most frequently asked SQL Interview Questions for freshers. SQL statements are broadly classified into three. They are

1. DDL – Data Definition Language

DDL is used to define the structure that holds the data. For example, Create, Alter, Drop and Truncate table.

2. DML – Data Manipulation Language

DML is used for manipulation of the data itself. Typical operations are Insert, Delete, Update and retrieving the data from the table. The Select statement is considered as a limited version of the DML, since it can't change the data in the database. But it can perform operations on data retrieved from the DBMS, before the results are returned to the calling function.

3. DCL – Data Control Language

DCL is used to control the visibility of data like granting database access and set privileges to create tables, etc. Example - Grant, Revoke access permission to the user to access data in the database.

5. What are the Advantages of SQL ?

1. SQL is not a proprietary language used by specific database vendors. Almost every major DBMS supports SQL, so learning this one language will enable programmers to interact with any database like ORACLE, SQL ,MYSQL etc.

2. SQL is easy to learn. The statements are all made up of descriptive English words, and there aren't that many of them.

3. SQL is actually a very powerful language and by using its language elements you can perform very complex and sophisticated database operations.

6. what is a field in a database ?

A field is an area within a record reserved for a specific piece of data.

Examples: Employee Name, Employee ID, etc.

7. What is a Record in a database ?

A record is the collection of values / fields of a specific entity: i.e. an Employee, Salary etc.

8. What is a Table in a database ?

A table is a collection of records of a specific type. For example, employee table, salary table etc.

9. What is a database transaction?

Database transaction takes database from one consistent state to another. At the end of the transaction the system must be in the prior state if the transaction fails or the status of the system should reflect the successful completion if the transaction goes through.

10. What are properties of a transaction?

(Expect this SQL Interview Questions as a part of an any interview, irrespective of your experience) Properties of the transaction can be summarized as ACID Properties.

1. Atomicity: A transaction consists of many steps. When all the steps in a transaction get completed, it will get reflected in DB or if any step fails, all the transactions are rolled back.

2. Consistency: The database will move from one consistent state to another, if the transaction succeeds and remain in the original state, if the transaction fails.

3. Isolation: Every transaction should operate as if it is the only transaction in the system.

4. Durability: Once a transaction has completed successfully, the updated rows/records must be available for all other transactions on a permanent basis.

11. What is a Database Lock ?

Database lock tells a transaction, if the data item in questions is currently being used by other transactions.

12. What are the type of locks ?

1. Shared Lock: When a shared lock is applied on data item, other transactions can only read the item, but can't write into it.

2. Exclusive Lock: When an exclusive lock is applied on data item, other transactions can't read or write into the data item.

Database Normalization Questions

13. What are the different type of normalization?

In database design, we start with one single table, with all possible columns. A lot of redundant data would be present since it's a single table. The process of removing the redundant data, by splitting up the table in a well defined fashion is called normalization.

1. First Normal Form (1NF): A relation is said to be in first normal form if and only if all underlying domains contain atomic values only. After 1NF, we can still have redundant data.

2. Second Normal Form (2NF): A relation is said to be in 2NF if and only if it is in 1NF and every non key attribute is fully dependent on the primary key. After 2NF, we can still have redundant data.

3. Third Normal Form (3NF): A relation is said to be in 3NF, if and only if it is in 2NF and every non key attribute is non-transitively dependent on the primary key.

Database Keys and Constraints SQL Questions

14. What is a primary key?

A primary key is a column whose values uniquely identify every row in a table. Primary key values can never be reused. If a row is deleted from the table, its primary key may not be assigned to any new rows in the future. To define a field as primary key, following conditions had to be met :

1. No two rows can have the same primary key value.

2. Every row must have a primary key value.

3. The primary key field cannot be null.

4. Value in a primary key column can never be modified or updated, if any foreign key refers to that primary key.

15. What is a Composite Key ?

A Composite primary key is a type of candidate key, which represents a set of columns whose values uniquely identify every row in a table.

For example - if "Employee_ID" and "Employee Name" in a table is combined to uniquely identify a row its called a Composite Key.

16. What is a Composite Primary Key ?

A Composite primary key is a set of columns whose values uniquely identify every row in a table. What it means is that, a table which contains composite primary key will be indexed based on the columns specified in the primary key. This key will be referred in Foreign Key tables.

For example - if the combined effect of columns, "Employee_ID" and "Employee Name" in a table is required to uniquely identify a row, its called a Composite Primary Key. In this case, both the columns will be represented as primary key.

17. What is a Foreign Key ?

When a "one" table's primary key field is added to a related "many" table in order to create the common field which relates the two tables, it is called a foreign key in the "many" table.

For example, the salary of an employee is stored in salary table. The relation is established via foreign key column “Employee_ID_Ref” which refers “Employee_ID” field in the Employee table.

18. What is a Unique Key ?

Unique key is same as primary with the difference being the existence of null. Unique key field allows one value as NULL value.

SQL Insert, Update and Delete Commands Interview Questions

19. Define SQL Insert Statement ?

SQL INSERT statement is used to add rows to a table. For a full row insert, SQL Query should start with “insert into “ statement followed by table name and values command, followed by the values that need to be inserted into the table. The insert can be used in several ways:

1. To insert a single complete row.

2. To insert a single partial row.

20. Define SQL Update Statement ?

SQL Update is used to update data in a row or set of rows specified in the filter condition.

The basic format of an SQL UPDATE statement is, Update command followed by table to be updated and SET command followed by column names and their new values followed by filter condition that determines which rows should be updated.

21. Define SQL Delete Statement ?

SQL Delete is used to delete a row or set of rows specified in the filter condition.

The basic format of an SQL DELETE statement is, DELETE FROM command followed by table name followed by filter condition that determines which rows should be updated.

22. What are wild cards used in database for Pattern Matching ?

SQL Like operator is used for pattern matching. SQL 'Like' command takes more time to process. So before using "like" operator, consider suggestions given below on when and where to use wild card search.

1) Don't overuse wild cards. If another search operator will do, use it instead.

2) When you do use wild cards, try not to use them at the beginning of the search pattern, unless absolutely necessary. Search patterns that begin with wild cards are the slowest to process.

3) Pay careful attention to the placement of the wild card symbols. If they are misplaced, you might not return the data you intended.

SQL Joins

23. Define Join and explain different type of joins?

Another frequently asked SQL Interview Questions on Joins. In order to avoid data duplication, data is stored in related tables. Join keyword is used to fetch data from related tables. "Join" return rows when there is at least one match in both table. Type of joins are

Right Join : Return all rows from the right table, even if there are no matches in the left table.

Outer Join: An outer join returns a set of records (or rows) that include what an inner join would return but also includes other rows for which no corresponding match is found in the other table.

Left Join: Return all rows from the left table, even if there are no matches in the right table.

Full Join: Return rows when there is a match in one of the tables.

24. What is Self-Join?

Self-join is query used to join a table to itself. Aliases should be used for the same table comparison.

25. What is Cross Join?

Cross Join will return all records where each row from the first table is combined with each row from the second table.

Database Views

26. What is a view?

The views are virtual tables. Unlike tables that contain data, views simply contain queries that dynamically retrieve data when used.

27. What is a materialized view?

Materialized views are also a view but are disk based. Materialized views get updates on specific duration, base upon the interval specified in the query definition. We can index materialized view.

28. What are the advantages and disadvantages of views in a database?

Advantages:

1. Views don't store data in a physical location.

2. The view can be used to hide some of the columns from the table.

3. Views can provide Access Restriction, since data insertion, update and deletion is not possible with the view.

Disadvantages:

1. When a table is dropped, associated view become irrelevant.

2. Since the view is created when a query requesting data from view is triggered, its a bit slow.

3. When views are created for large tables, it occupies more memory.

29. What is a stored procedure?

Stored Procedure is a function which contains a collection of SQL Queries. The procedure can take inputs , process them and send back output.

30. What are the advantages of a stored procedure?

Stored Procedures are precomplied and stored in the database. This enables the database to execute the queries much faster. Since many queries can be included in a stored procedure, round trip time to execute multiple queries from source code to database and back is avoided.

31. What is a trigger?

Database triggers are sets of commands that get executed when an event(Before Insert, After Insert, On Update, On delete of a row) occurs on a table, views.

32. Explain the difference between DELETE , TRUNCATE and DROP commands?

Once delete operation is performed, Commit and Rollback can be performed to retrieve data.

Once the truncate statement is executed, Commit and Rollback statement cannot be performed. Where condition can be used along with delete statement but it can't be used with truncate statement.

Drop command is used to drop the table or keys like primary,foreign from a table.

33. What is the difference between Cluster and Non cluster Index?

A clustered index reorders the way records in the table are physically stored. There can be only one clustered index per table. It makes data retrieval faster.

A non clustered index does not alter the way it was stored but creates a completely separate object within the table. As a result insert and update command will be faster.

34. What is Union, minus and Interact commands?

MINUS operator is used to return rows from the first query but not from the second query. INTERSECT operator is used to return rows returned by both the queries.

SQL

35. What is the difference between SQL, MySQL or SQL server?

SQL or Structured Query Language is a language; language that communicates with a relational database thus providing ways of manipulating and creating databases. MySQL and Microsoft's SQL Server both are relational database management systems that use SQL as their standard relational database language.

36. What is the difference between SQL and PL/SQL?

PL/SQL is a dialect of SQL that adds procedural features of programming languages in SQL. It was developed by Oracle Corporation in the early 90's to enhance the capabilities of SQL.

37. What are the various DDL commands in SQL? Give brief description of their purpose.

Following are various DDL or Data Definition Language commands in SQL −

CREATE − it creates a new table, a view of a table, or other object in database.

ALTER − it modifies an existing database object, such as a table.

DROP − it deletes an entire table, a view of a table or other object in the database.

38. What are the various DML commands in SQL? Give brief description of their purpose.

Following are various DML or Data Manipulation Language commands in SQL −

SELECT − it retrieves certain records from one or more tables.

INSERT − it creates a record.

UPDATE − it modifies records.

DELETE − it deletes records.

39. What are the various DCL commands in SQL? Give brief description of their purpose.

Following are various DCL or Data Control Language commands in SQL −

GRANT − it gives a privilege to user.

REVOKE − it takes back privileges granted from user.

40. Can you sort a column using a column alias?

Yes. A column alias could be used in the ORDER BY clause.

50. Is a NULL value same as zero or blank space? If not, what is the difference?

A NULL value is not same as zero or a blank space. A NULL value is a value which is 'unavailable, unassigned, unknown or not applicable'. Whereas, zero is a number and blank space is a character.

51. If a column value taking part in an arithmetic expression is NULL, then the result obtained would be NULL. True

52. If a table contains duplicate rows, does a query result display the duplicate values by default? How can elimate duplicate values from a query result if so? True

A query result displays all rows including the duplicate rows. To eliminate duplicate rows in the result, the DISTINCT keyword is used in the SELECT clause.

53. What is the purpose of the condition operators BETWEEN and IN?

The BETWEEN operator displays rows based on a range of values. The IN condition operator checks for values contained in a specific set of values.

54. How do you search for a value in the database when you don't have the exact value to search for?

In such cases, the LIKE condition operator is used to select rows that match a character pattern. This is also called 'wildcard' search.

55. What is the default ordering of data using the order by clause? How could it be changed?

The default sorting order is ascending. It can be changed using the DESC keyword, after the column name in the ORDER BY clause.

56. What are the specific uses of SQL functions?

SQL functions have the following uses −

- Performing calculations on data
- Modifying individual data items
- Manipulating the output
- Formatting dates and numbers
- Converting data types

57. What are the case manipulation functions of SQL?

LOWER, UPPER, INITCAP

58. What function returns the remainder in a division operation?

The MOD function returns the remainder in a division operation.

59. What is the purpose of the NVL function?

The NVL function converts a NULL value to an actual value.

60. What is the difference between the NVL and NVL2 function?

The NVL(exp1, exp2) function converts the source expression (or value) exp1 to the target expression (or value) exp2, if exp1 contains NULL. The return value has the same data type as that of exp1.

The NVL2(exp1, exp2, exp3) function checks the first expression exp1, if it is not null then, the second expression exp2 is returned. If the first expression exp1 is null, then the third expression exp3 is returned.

61. What is the use of NULLIF function?

The NULLIF function compares two expressions. If they are equal, the function returns null. If they are not equal, the first expression is returned.

62. Discuss the syntax and use of COALESCE function

The COALESCE function has the expression COALESCE(exp1, exp2, …. expn)

It returns the first non-null expression given in the parameter list.

63. What expression or function allows you to implement conditional processing in an SQL statement?

There are two ways to implement conditional processing or IF-THEN-ELSE logic in a SQL statement.

Using CASE expression

Using the DECODE function

64. You want to display a result query from joining two tables with 20 and 10 rows respectively. You forget to write the WHERE clause. What would be the result?

The result would be the Cartesian product of two tables with 20 x 10 = 200 rows.

65. What is the difference between cross joins and natural joins?

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

66. What is the purpose of group (aggregate) function in SQL? Give some examples of group functions.

Group functions in SQL work on sets of rows and returns one result per group. Examples of group functions are AVG, COUNT, MAX, MIN, STDDEV, SUM, VARIANCE.

67. Is it true that by default group functions consider only distinct values in the set? False

By default, group functions consider all values including the duplicate values.

68. Is it true that the DISTINCT keyword allows a function to consider only non-duplicate values? True

69. Is it true that all group functions ignore NULL values? True

70. Is it true that COUNT(*) returns the number of columns in a table?

False. COUNT(*) returns the number of rows in a table.

71. What's wrong in the following query?

Select subject_code, count(name) from students;

It doesn't have a GROUP BY clause. The subject_code should be in the GROUP BY clause.

Select subject_code, count(name) from students GROUP BY subject_code;

72. What's wrong in the following query?

SELECT subject_code, AVG (marks) FROM students

  WHERE AVG(marks) > 75 GROUP BY subject_code;

The WHERE clause cannot be used to restrict groups. The HAVING clause should be used.

SELECT subject_code, AVG (marks) FROM students

  HAVING AVG(marks) > 75 GROUP BY subject_code;