Viva Voce Questions

1.   What is DBMS?

A Database Management System (DBMS) is a program that controls creation, maintenance and use of a database. DBMS can be termed as File Manager that manages data in a database rather than saving it in file systems.

2.   What is RDBMS?

RDBMS stands for Relational Database Management System. RDBMS store the data into the collection of tables, which is related by common fields between the columns of the table. It also provides relational operators to manipulate the data stored into the tables.

Example: Oracle, SQL Server.

3.   What is SQL?

SQL stands for Structured Query Language, and it is used to communicate with the Database. This is a standard language used to perform tasks such as retrieval, updation, insertion and deletion of data from a database.

4.   What is a Database?

Database is nothing but an organized form of data for easy access, storing, retrieval and managing of data. This is also known as structured form of data which can be accessed in many ways.

Example: School Management Database, Bank Management Database.

5.   What are Tables and Fields?

A table is a set of data that are organized in a model with Columns and Rows. Columns can be categorized as vertical, and Rows are horizontal. A table has specified number of columns called fields but can have any number of rows which is called records

Example: Table: Employee.

Field: Emp-ID, Emp-Name, Date of Birth.

6.   What is a primary key?

A primary key is a combination of fields which uniquely specify a row. This is a special kind of unique key, and it has implicit NOT NULL constraint. It means Primary key values cannot be NULL.

7. What is a unique key?

A Unique key constraint uniquely identifies each record in the database. This provides uniqueness for the column or set of columns. A Primary key constraint has automatic unique constraint defined on it. There can be many unique constraints defined per table, but only one Primary key constraint defined per table.

8. What is a foreign key?

A foreign key in one table is related to the primary key of another table. Relationship needs to be created between two tables by referencing foreign key with the primary key of another table.

9. What is a join?

This is a keyword used to query data from more tables based on the relationship between the fields of the tables. Keys play a major role when JOINs are used.

10. What are the types of join and explain each?

There are various types of join which can be used to retrieve data and it depends on the relationship between tables.

(a). Inner join: Inner join return rows when there is at least one match of rows between the tables.

(b). Right Join: Right join return rows which are common between the tables and all rows of Right hand side table. Simply, it returns all the rows from the right hand side table even though there are no matches in the left hand side table.

(c). Left Join: Left join return rows which are common between the tables and all rows of Left hand side table. Simply, it returns all the rows from Left hand side table even though there are no matches in the Right hand side table.

(d). Full Join: Full join return rows when there are matching rows in any one of the tables. This means, it returns all the rows from the left hand side table and all the rows from the right hand side table.

11. What is normalization?

Normalization is the process of minimizing redundancy and dependency by organizing fields and table of a database. The main aim of Normalization is to add, delete or modify field that can be made in a single table.

12. What is Denormalization?

DeNormalization is a technique used to access the data from higher to lower normal forms of database. It is also process of introducing redundancy into a table by incorporating data from the related tables.

13. Define 1NF, 2NF and 3NF.

First Normal Form (1NF): This should remove all the duplicate columns from the table. Creation of tables for the related data and identification of unique columns.

Second Normal Form (2NF): Meeting all requirements of the first normal form. Placing the subsets of data in separate tables and Creation of relationships between the tables using primary keys.

Third Normal Form (3NF): This should meet all requirements of 2NF. Removing the columns which are not dependent on primary key constraints.

14. What is a View?

A view is a virtual table which consists of a subset of data contained in a table. View can have data of one or more tables combined.

15. What is an Index?

An index is performance tuning method of allowing faster retrieval of records from the table. An index creates an entry for each value and it will be faster to retrieve data.

16.   What are all the different types of indexes?

There are three types of indexes:

(a). Unique Index: This indexing does not allow the field to have duplicate values if the column is unique indexed. Unique index can be applied automatically when primary key is defined.

(b). Clustered Index: This type of index reorders the physical order of the table and search based on the key values. Each table can have only one clustered index.

(c). Non-Clustered Index: Non-Clustered Index does not alter the physical order of the table and maintains logical order of data. Each table can have 999 non-clustered indexes.

17. What is a Cursor?

A database Cursor is a control which enables traversal over the rows or records in the table. This can be viewed as a pointer to one row in a set of rows. Cursor is very much useful for traversing such as retrieval, addition and removal of database records.

18. What is a relationship and what are they?

Database Relationship is defined as the connection between the tables in a database. There are various data basing relationships, and they are as follows:

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

19. What is a query?

A DB query is a code written in order to get the information back from the database. Query can be designed in such a way that it matched with our expectation of the result set. Simply, a question to the Database.

20. What is sub-query?

A sub-query is a query within another query. The outer query is called as main query, and inner query is called sub-query. Sub-Query is always executed first, and the result of sub-query is passed on to the main query.

21. What are the types of sub-queries?

There are two types of sub-queries – Correlated and Non-Correlated.

A Correlated sub-query cannot be considered as independent query, but it can refer the column in a table listed in the FROM the list of the main query.

A Non-Correlated sub query can be considered as independent query and the output of sub-query are substituted in the main query.

22. What is a stored procedure?

Stored Procedure is a function consists of many SQL statement to access the database system. Several SQL statements are consolidated into a stored procedure and execute them whenever and wherever required.

23. What is a trigger?

A DB trigger is a code or programs that automatically execute with response to some event on a table or view in a database. Mainly, trigger helps to maintain the integrity of the database.

Example: When a new student is added to the student database, new records should be created in the related tables like Exam, Score and Attendance tables.

24. What is the difference between DELETE and TRUNCATE commands?

DELETE command is used to remove rows from the table, and WHERE clause can be used for conditional set of parameters. Commit and Rollback can be performed after delete statement.

TRUNCATE removes all rows from the table. Truncate operation cannot be rolled back.

25. What are local and global variables and their differences?

Local variables are the variables which can be used or exist inside the function. They are not known to the other functions and those variables cannot be referred or used. Variables can be created whenever that function is called.

Global variables are the variables which can be used or exist throughout the program. Same variable declared in global cannot be used in functions. Global variables cannot be created whenever that function is called.

26. What is a constraint?

Constraint can be used to specify the limit on the data type of table. Constraint can be specified while creating or altering the table statement. Sample of constraint are.

- NOT NULL.
- CHECK.
- DEFAULT.
- UNIQUE.
- PRIMARY KEY.
- FOREIGN KEY.

27. What is data Integrity?

Data Integrity defines the accuracy and consistency of data stored in a database. It can also define integrity constraints to enforce business rules on the data when it is entered into the application or database.

28. What is Auto Increment?

Auto increment keyword allows the user to create a unique number to be generated when a new record is inserted into the table. AUTO INCREMENT keyword can be used in Oracle and IDENTITY keyword can be used in SQL SERVER.

Mostly this keyword can be used whenever PRIMARY KEY is used.

29. What is the difference between Cluster and Non-Cluster Index?

Clustered index is used for easy retrieval of data from the database by altering the way that the records are stored. Database sorts out rows by the column which is set to be clustered index.

A Non-Clustered index does not alter the way it was stored but creates a complete separate object within the table. It points back to the original table rows after searching.

30. What is Data warehouse?

Data warehouse is a central repository of data from multiple sources of information. Those data are consolidated, transformed and made available for the mining and online processing. Warehouse data have a subset of data called Data Marts.

31. What is Self-Join?

Self-join is set to be query used to compare to itself. This is used to compare values in a column with other values in the same column in the same table. ALIAS can be used for the same table comparison.

32. What is Cross-Join?

Cross join defines as Cartesian product where number of rows in the first table multiplied by number of rows in the second table. If suppose, WHERE clause is used in cross join then the query will work like an INNER JOIN.

33. What is user defined functions?

User defined functions are the functions written to create user-defined logic whenever required. It is not necessary to write the same logic several times. Instead, function can be called or executed whenever needed.

34. What are the types of user defined functions?

Three types of user defined functions are.

- Scalar Functions.
- Inline Table valued functions.
- Multi statement valued functions.

35. What is collation?

Collation is defined as set of rules that determine how character data can be sorted and compared. ASCII value can be used to compare these character data.

36. What are all different types of collation sensitivity?

Following are different types of collation sensitivity -.

- Case Sensitivity – A and a, B and b.
- Accent Sensitivity.
- Width Sensitivity – Single byte character and double byte character.

37. Advantages and Disadvantages of Stored Procedure?

Stored procedure can be used as a modular programming – means create once, store and call for several times whenever required. This supports faster execution instead of executing multiple queries. This reduces network traffic and provides better security to the data.

Disadvantage is that it can be executed only in the Database and utilizes more memory in the database server.

38. What is OLTP?

Online Transaction Processing or OLTP manages transaction based applications which can be used for data entry and easy retrieval processing of data. This processing makes like easier on simplicity and efficiency. It is faster, gives accurate results and expensive.

Example : Bank Transactions on a daily basis.

39. What is CLAUSE?

SQL clause is defined to limit the result set by providing condition to the query. This usually filters some rows from the whole set of records.

Example: Query that has WHERE condition

40. What is recursive stored procedure?

A stored procedure which calls by itself until it reaches some boundary condition. This recursive function or procedure helps programmers to use the same set of code any number of times.

41. What is Union, Minus and Intersect commands?

UNION operator is used to combine the results of two tables, and it eliminates duplicate rows from the tables.

MINUS operator is used to return rows from the first query but not from the second query. Matching records of first and second query and other rows from the first query will be displayed as a result set.

INTERSECT operator is used to return rows returned by both the queries.

42.   What is an ALIAS command?

ALIAS name can be given to a table or column. This alias name can be referred in WHERE clause to identify the table or column.

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

TRUNCATE removes all the rows from the table, and it cannot be rolled back. DROP command removes a table from the database and operation cannot be rolled back.

44.   What are aggregate and scalar functions?

Aggregate functions are used to evaluate mathematical calculation and return single values. This can be calculated from the columns in a table. Scalar functions return a single value based on the input value.

Example: Aggregate – Max( ), Count( ) – Calculated with respect to numeric.

Scalar – UCASE( ), NOW( ) – Calculated with respect to strings.

45. **Data Definition Language** (DDL) statements are used to define the database structure or schema.

- CREATE - to create objects in the database
- ALTER - alters the structure of the database
- DROP - delete objects from the database
- TRUNCATE - remove all records from a table, including all spaces allocated for the records are removed
- RENAME - rename an object

46. Data Manipulation Language (DML) statements are used for managing data within schema objects.

- SELECT - retrieve data from the a database
- INSERT - insert data into a table
- UPDATE - updates existing data within a table
- DELETE - deletes all records from a table, the space for the records remain

47. Data Control Language (DCL) statements.

- GRANT - gives user's access privileges to database
- REVOKE - withdraw access privileges given with the GRANT command

48. List out some TCL commands

Transaction Control (TCL) statements are used to manage the changes made by DML statements. It allows statements to be grouped together into logical transactions.

- COMMIT - save work done
- SAVEPOINT - identify a point in a transaction to which you can later roll back
- ROLLBACK - restore database to original since the last COMMIT

49. Data type in SQL

SQL data type is an attribute that specifies type of data of any object. Each column, variable and expression has related data type used while creating or altering the table.

Some of the mostly used data types are

- **Number-** Data type used to feed an inter/decimal value
- **BOOLEAN** - A Boolean value either true, false or null.
- **CHAR(size)** or **CHARACTER(size)** - A string of fixed length. The maximum size of a CHAR string is 255 characters.
- **VARCHAR(size)** - A string of variable length. The size constraint of these string types do not have to be given and defaults to the maximum possible size of strings that the database is able to store.
- **DATE** - A day/month/year value. Eg. 05-Feb-2013

50. Difference between TRUNCATE, DELETE and DROP commands

Drop and Truncate :

DROP and TRUNCATE are DDL commands, whereas DELETE is a DML command. Therefore DELETE operations can be rolled back (undone), while DROP and TRUNCATE operations cannot be rolled back.

Delete:

The DELETE command is used to remove rows from a table. A WHERE clause can be used to only remove some rows. If no WHERE condition is specified, all rows will be removed. After performing a DELETE operation you need to COMMIT or ROLLBACK the transaction to make the change permanent or to undo it. Note that this operation will cause all DELETE triggers on the table to fire.

Truncate:

TRUNCATE removes all rows from a table. The operation cannot be rolled back and no triggers will be fired. As such, TRUCATE is faster and doesn't use as much undo space as a DELETE.

Drop:

The DROP command removes a table from the database. All the tables' rows, indexes and privileges will also be removed. No DML triggers will be fired. The operation cannot be rolled back.

Delete and Truncate:

1. TRUNCATE is a DDL command whereas DELETE is a DML command.

2. TRUNCATE is much faster than DELETE.

3. Roll back is not possible in TRUNCATE but in DELETE rollback is applied .TRUNCATE removes the record permanently.

4. In case of TRUNCATE ,Trigger are not fired. But in DML commands like DELETE .Trigger get fired.

5. Conditions(WHERE clause) are not used in TRUNCATE. But in DELETE conditions using WHERE clause are applied.

51. Explain about Group by and Order by

The SQL **ORDER BY** clause is used to sort the data in ascending or descending order, based on one or more columns. By default sorts query results in ascending order keyword used to sort in descending order is DESC.

The SQL **GROUP BY** clause is used in collaboration with the SELECT statement to arrange identical data into groups. The GROUP BY clause follows the WHERE clause in a SELECT statement and precedes the ORDER BY clause.

52. Explain about distinct keyword.

The SQL **DISTINCT** keyword is used in conjunction with SELECT statement to eliminate all the duplicate records and fetching only unique records.

53. Explain about having clause.

The HAVING clause enables you to specify conditions that filter which group results appear in the final results. The WHERE clause places conditions on the selected columns, whereas the HAVING clause places conditions on groups created by the GROUP BY clause.

54. What is a where clause?

A WHERE clause is used to filter the records and fetch only necessary records based on condition. The WHERE clause not only used in SELECT statement, but it is also used in UPDATE, DELETE statement etc

55. Explain about alter command.

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

56. Explain different operators used in SQL.

An operator is a reserved word or a character used primarily in an SQL statement's WHERE clause to perform operation(s), such as comparisons and arithmetic operations. Operators are used to specify conditions in an SQL statement and to serve as conjunctions for multiple conditions in a statement.

- Arithmetic operators (+, -, *, /, mod)
- Comparison operators (< less than,>greater than ,<=less than equal ,>= greater than equal ,=equal to ,<> not equal
- Logical operators (AND, OR, NOT)

57. Use of Like operator in SQL.

The SQL **LIKE** clause is used to compare a value to similar values using wildcard operators. There are two wildcards used in conjunction with the LIKE operator:

- The percent sign (%)

- The underscore (_)

The percent sign represents zero or multiple characters. The underscore represents a single number or character. The symbols can be used in combinations.

58. What are entities and attributes referring to?

Table consists of some properties that are known as attributes. These consist of the representation of entity in the table. They are represented by columns in the table. Entity is referred to the store data about any particular thing.

59. Explain about built in function in SQL

Group-by functions :- Group functions are used to retrieve multiple rows/columns using group by clause.

Single Row Functions: Single row or Scalar functions return a value for every row that is processed in a query. There are four types of single row functions. They are:

1) Mathematical Functions: These are functions that accept numeric input and return numeric values. Ex:- ABS (x), CEIL(x), FLOOR(x), TRUNC(x) etc..

2) Character or Text Functions: These are functions that accept character input and can return both character and number values. Ex:- LOWER(), UPPER(), LENGTH(), TRIM(), LPAD. Etc.

3) Date Functions: These are functions that take values that are of data-type DATE as input and return values of data-type DATE, except for the MONTHS_BETWEEN function, which returns a number. ADD_MONTHS(), NEXT_DAY(),LAST_DAY(),NEW_TIME() etc..

4) Conversion Functions: These are functions that help us to convert a value in one form to another form. For Example: a null value into an actual value, or a value from one data-type to another data-type like NVL, TO_CHAR, TO_NUMBER, TO_DATE etc.

60. What is a DUAL Table in Oracle?
This is a single row and single column dummy table provided by oracle, used to perform mathematical /functional calculations without using a table.