SQL-interview Questions

SQL

SQL is an English like language consisting of commands to store, retrieve, maintain & regulate access to your database.

SQL*Plus

SQL*Plus is an application that recognizes & executes SQL commands & specialized SQL*Plus commands that can customize reports, provide help & edit facility & maintain system variables.

NVL

NVL : Null value function converts a null value to a non-null value for the purpose of evaluating an expression. Numeric Functions accept numeric I/P & return numeric values. They are MOD, SQRT, ROUND, TRUNC & POWER.

Date Functions

Date Functions are ADD_MONTHS, LAST_DAY, NEXT_DAY, MONTHS_BETWEEN & SYSDATE.

Character Functions

Character Functions are INITCAP, UPPER, LOWER, SUBSTR & LENGTH. Additional functions are GREATEST & LEAST. Group Functions returns results based upon groups of rows rather than one result per row, use group functions. They are AVG, COUNT, MAX, MIN & SUM.

TTITLE & BTITLE

TTITLE & BTITLE are commands to control report headings & footers.

COLUMN

COLUMN command define column headings & format data values.

BREAK

BREAK command clarify reports by suppressing repeated values, skipping lines & allowing for controlled break points.

COMPUTE

command control computations on subsets created by the BREAK command.

SET

SET command changes the system variables affecting the report environment.

SPOOL

SPOOL command creates a print file of the report.

JOIN

JOIN is the form of SELECT command that combines info from two or more tables.

Types of Joins are Simple (Equijoin & Non-Equijoin), Outer & Self join.

Equijoin returns rows from two or more tables joined together based upon a equality condition in the WHERE clause.

Non-Equijoin returns rows from two or more tables based upon a relationship other than the equality condition in the WHERE clause.

Outer Join combines two or more tables returning those rows from one table that have no direct match in the other table.

Self Join joins a table to itself as though it were two separate tables.

Union

Union is the product of two or more tables.

Intersect

Intersect is the product of two tables listing only the matching rows.

Minus

Minus is the product of two tables listing only the non-matching rows.

Correlated Subquery

Correlated Subquery is a subquery that is evaluated once for each row processed by the parent statement. Parent statement can be Select, Update or Delete. Use CRSQ to answer multipart questions whose answer depends on the value in each row processed by parent statement.

Multiple columns

Multiple columns can be returned from a Nested Subquery.

Sequences

Sequences are used for generating sequence numbers without any overhead of locking. Drawback is that after generating a sequence number if the transaction is rolled back, then that

sequence number is lost.

Synonyms

Synonyms is the alias name for table, views, sequences & procedures and are created for reasons of Security and Convenience.

Two levels are Public - created by DBA & accessible to all the users. Private - Accessible to creator only. Advantages are referencing without specifying the owner and Flexibility to customize a more meaningful naming convention.

Indexes

Indexes are optional structures associated with tables used to speed query execution and/or guarantee uniqueness. Create an index if there are frequent retrieval of fewer than 10-15% of the rows in a large table and columns are referenced frequently in the WHERE clause. Implied tradeoff is query speed vs. update speed. Oracle automatically update indexes. Concatenated index max. is 16 columns.

Data types

Max. columns in a table is 255. Max. Char size is 255, Long is 64K & Number is 38 digits.
Cannot Query on a long column.
Char, Varchar2 Max. size is 2000 & default is 1 byte.
Number(p,s) p is precision range 1 to 38, s is scale -84 to 127.
Long Character data of variable length upto 2GB.
Date Range from Jan 4712 BC to Dec 4712 AD.
Raw Stores Binary data (Graphics Image & Digitized Sound). Max. is 255 bytes.
Mslabel Binary format of an OS label. Used primarily with Trusted Oracle.

Order of SQL statement execution

Where clause, Group By clause, Having clause, Order By clause & Select.

Transaction

Transaction is defined as all changes made to the database between successive commits.

Commit

Commit is an event that attempts to make data in the database identical to the data in the form. It involves writing or posting data to the database and committing data to the database. Forms check the validity of the data in fields and records during a commit. Validity check are uniqueness, consistency and db restrictions.

Posting

Posting is an event that writes Inserts, Updates & Deletes in the forms to the database but not

committing these transactions to the database.

Rollback

Rollback causes work in the current transaction to be undone.

Savepoint

Savepoint is a point within a particular transaction to which you may rollback without rolling back the entire transaction.

Set Transaction

Set Transaction is to establish properties for the current transaction.

Locking

Locking are mechanisms intended to prevent destructive interaction between users accessing data. Locks are used to achieve.

Consistency

Consistency : Assures users that the data they are changing or viewing is not changed until the are thro' with it.

Integrity

Assures database data and structures reflects all changes made to them in the correct sequence. Locks ensure data integrity and maximum concurrent access to data. Commit statement releases all locks. Types of locks are given below.

Data Locks protects data i.e. Table or Row lock.

Dictionary Locks protects the structure of database object i.e. ensures table's structure does not change for the duration of the transaction.

Internal Locks & Latches protects the internal database structures. They are automatic.

Exclusive Lock allows queries on locked table but no other activity is allowed.

Share Lock allows concurrent queries but prohibits updates to the locked tables.

Row Share allows concurrent access to the locked table but prohibits for a exclusive table lock.

Row Exclusive same as Row Share but prohibits locking in shared mode.

Shared Row Exclusive locks the whole table and allows users to look at rows in the table but prohibit others from locking the table in share or updating them.

Share Update are synonymous with Row Share.

Deadlock

Deadlock is a unique situation in a multi user system that causes two or more users to wait indefinitely for a locked resource. First user needs a resource locked by the second user and the second user needs a resource locked by the first user. To avoid dead locks, avoid using exclusive table lock and if using, use it in the same sequence and use Commit frequently to release locks.

Mutating Table

Mutating Table is a table that is currently being modified by an Insert, Update or Delete statement. Constraining Table is a table that a triggering statement might need to read either directly for a SQL statement or indirectly for a declarative Referential Integrity constraints. Pseudo Columns behaves like a column in a table but are not actually stored in the table. E.g. Currval, Nextval, Rowid, Rownum, Level etc.

SQL*Loader

SQL*Loader is a product for moving data in external files into tables in an Oracle database. To load data from external files into an Oracle database, two types of input must be provided to SQL*Loader : the data itself and the control file. The control file describes the data to be loaded. It describes the Names and format of the data files, Specifications for loading data and the Data to be loaded (optional). Invoking the loader sqlload username/password controlfilename .

The most important DDL statements in SQL are:

CREATE TABLE - creates a new database table
ALTER TABLE - alters (changes) a database table
DROP TABLE - deletes a database table
CREATE INDEX - creates an index (search key)
DROP INDEX - deletes an index

Operators used in SELECT statements.

= Equal
or != Not equal
> Greater than
>= Greater than or equal

What does the following query do?
SELECT SAL + NVL(COMM,0) FROM EMP;?
This displays the total salary of all employees. The null values in the commission column will be replaced by 0 and added to salary.

What is the advantage of specifying WITH GRANT OPTION in the GRANT command?
The privilege receiver can further grant the privileges he/she has obtained from the owner to any other user.

START or @.

What is the value of comm and sal after executing the following query if the initial value of 'sal' is 10000 UPDATE EMP SET SAL = SAL + 1000, COMM = SAL*0.1;?
sal = 11000, comm = 1000.

Which command displays the SQL command in the SQL buffer, and then executes it?
RUN.

What command is used to get back the privileges offered by the GRANT command?
REVOKE.

What will be the output of the following query?
SELECT DECODE(TRANSLATE('A','1234567890','1111111111'), '1','YES', 'NO');?
NO.
Explanation : The query checks whether a given string is a numerical digit.

Which date function is used to find the difference between two dates?
MONTHS_BETWEEN.

What operator performs pattern matching?

LIKE operator.

What is the use of the DROP option in the ALTER TABLE command?

It is used to drop constraints specified on the table.

What operator tests column for the absence of data?

IS NULL operator.

What are the privileges that can be granted on a table by a user to others?

Insert, update, delete, select, references, index, execute, alter, all.

Which function is used to find the largest integer less than or equal to a specific value?

FLOOR.

Which is the subset of SQL commands used to manipulate Oracle Database structures, including tables?

Data Definition Language (DDL).

What is the use of DESC in SQL?

DESC has two purposes. It is used to describe a schema as well as to retrieve rows from table in descending order.

Explanation :

The query SELECT * FROM EMP ORDER BY ENAME DESC will display the output sorted on ENAME in descending order.

What command is used to create a table by copying the structure of another table?

CREATE TABLE .. AS SELECT command

Explanation:

To copy only the structure, the WHERE clause of the SELECT command should contain a FALSE statement as in the following.

CREATE TABLE NEWTABLE AS SELECT * FROM EXISTINGTABLE WHERE 1=2;

If the WHERE condition is true, then all the rows or rows satisfying the condition will be copied

to the new table.

TRUNCATE TABLE EMP; DELETE FROM EMP; Will the outputs of the above two commands differ?

Both will result in deleting all the rows in the table EMP..

What is the output of the following query SELECT TRUNC(1234.5678,-2) FROM DUAL;?

1200.

What are the wildcards used for pattern matching.?

_ for single character substitution and % for multi-character substitution.

What is the parameter substitution symbol used with INSERT INTO command?

&

What's an SQL injection?

SQL Injection is when form data contains an SQL escape sequence and injects a new SQL query to be run.

What is difference between TRUNCATE & DELETE ?

TRUNCATE commits after deleting entire table i.e., cannot be rolled back. Database triggers do not fire on TRUNCATE

DELETE allows the filtered deletion. Deleted records can be rolled back or committed. Database triggers fire on DELETE.

What is a join? Explain the different types of joins?

Join is a query, which retrieves related columns or rows from multiple tables.

Self Join - Joining the table with itself.

Equi Join - Joining two tables by equating two common columns.

Non-Equi Join - Joining two tables by equating two common columns.

Outer Join - Joining two tables in such a way that query can also retrieve rows that do not have corresponding join value in the other table.

What is the sub-query?

Sub-query is a query whose return values are used in filtering conditions of the main query.

What is correlated sub-query?

Correlated sub-query is a sub-query, which has reference to the main query.

Explain CONNECT BY PRIOR?

Retrieves rows in hierarchical order eg.
select empno, ename from emp where.

Difference between SUBSTR and INSTR?

INSTR (String1, String2 (n, (m)),
INSTR returns the position of the m-th occurrence of the string 2 in string1. The search begins from nth position of string1.
SUBSTR (String1 n, m)
SUBSTR returns a character string of size m in string1, starting from n-th position of string1.

Explain UNION, MINUS, UNION ALL and INTERSECT?

INTERSECT - returns all distinct rows selected by both queries. MINUS - returns all distinct rows selected by the first query but not by the second. UNION - returns all distinct rows selected by either query UNION ALL - returns all rows selected by either query, including all duplicates.

What is ROWID?

ROWID is a pseudo column attached to each row of a table. It is 18 characters long, blockno, rownumber are the components of ROWID.

What is the fastest way of accessing a row in a table?

Using ROWID.
CONSTRAINTS

What is an integrity constraint?
Integrity constraint is a rule that restricts values to a column in a table.

What is referential integrity constraint?
Maintaining data integrity through a set of rules that restrict the values of one or more columns of the tables based on the values of primary key or unique key of the referenced table.

What is the usage of SAVEPOINTS?
SAVEPOINTS are used to subdivide a transaction into smaller parts. It enables rolling back part of a transaction. Maximum of five save points are allowed.

What is ON DELETE CASCADE?
When ON DELETE CASCADE is specified Oracle maintains referential integrity by automatically removing dependent foreign key values if a referenced primary or unique key value is removed.

What are the data types allowed in a table?
CHAR, VARCHAR2, NUMBER, DATE, RAW, LONG and LONG RAW.

What is difference between CHAR and VARCHAR2? What is the maximum SIZE allowed for each type?
CHAR pads blank spaces to the maximum length.
VARCHAR2 does not pad blank spaces.
For CHAR the maximum length is 255 and 2000 for VARCHAR2.

How many LONG columns are allowed in a table? Is it possible to use LONG columns in WHERE clause or ORDER BY?
Only one LONG column is allowed. It is not possible to use LONG column in WHERE or ORDER BY clause.

What are the pre-requisites to modify datatype of a column and to add a column with NOT NULL constraint?

- To modify the datatype of a column the column must be empty.
- To add a column with NOT NULL constrain, the table must be empty.

Where the integrity constraints are stored in data dictionary?

The integrity constraints are stored in USER_CONSTRAINTS.

How will you activate/deactivate integrity constraints?

The integrity constraints can be enabled or disabled by ALTER TABLE ENABLE CONSTRAINT / DISABLE CONSTRAINT.

If unique key constraint on DATE column is created, will it validate the rows that are inserted with SYSDATE?

It won't, Because SYSDATE format contains time attached with it.

What is a database link?

Database link is a named path through which a remote database can be accessed.

How to access the current value and next value from a sequence? Is it possible to access the current value in a session before accessing next value?

Sequence name CURRVAL, sequence name NEXTVAL. It is not possible. Only if you access next value in the session, current value can be accessed.

What is CYCLE/NO CYCLE in a Sequence?

CYCLE specifies that the sequence continue to generate values after reaching either maximum or minimum value. After pan-ascending sequence reaches its maximum value, it generates its minimum value. After a descending sequence reaches its minimum, it generates its maximum.

NO CYCLE specifies that the sequence cannot generate more values after reaching its maximum or minimum value.

What are the advantages of VIEW?

- To protect some of the columns of a table from other users.
- To hide complexity of a query.

- To hide complexity of calculations.

Can a view be updated/inserted/deleted? If Yes - under what conditions?

A View can be updated/deleted/inserted if it has only one base table if the view is based on columns from one or more tables then insert, update and delete is not possible.

If a view on a single base table is manipulated will the changes be reflected on the base table?

If changes are made to the tables and these tables are the base tables of a view, then the changes will be reference on the view.

Which of the following statements is true about implicit cursors?

1. Implicit cursors are used for SQL statements that are not named.
2. Developers should use implicit cursors with great care.
3. Implicit cursors are used in cursor for loops to handle data processing.
4. Implicit cursors are no longer a feature in Oracle.

Which of the following is not a feature of a cursor FOR loop?

1. Record type declaration.
2. Opening and parsing of SQL statements.
3. Fetches records from cursor.
4. Requires exit condition to be defined.

A developer would like to use referential datatype declaration on a variable. The variable name is EMPLOYEE_LASTNAME, and the corresponding table and column is EMPLOYEE, and LNAME, respectively. How would the developer define this variable using referential datatypes?

1. Use employee.lname%type.
2. Use employee.lname%rowtype.
3. Look up datatype for EMPLOYEE column on LASTNAME table and use that.
4. Declare it to be type LONG.

Which three of the following are implicit cursor attributes?

1. %found
2. %too_many_rows

3. %notfound
4. %rowcount
5. %rowtype

If left out, which of the following would cause an infinite loop to occur in a simple loop?

1. LOOP
2. END LOOP
3. IF-THEN
4. EXIT

Which line in the following statement will produce an error?

1. cursor action_cursor is
2. select name, rate, action
3. into action_record
4. from action_table;
5. There are no errors in this statement.

The command used to open a CURSOR FOR loop is

1. open
2. fetch
3. parse
4. None, cursor for loops handle cursor opening implicitly.

What happens when rows are found using a FETCH statement

1. It causes the cursor to close
2. It causes the cursor to open
3. It loads the current row values into variables
4. It creates the variables to hold the current row values

Under which circumstance must you recompile the package body after recompiling the package specification?

1. Altering the argument list of one of the package constructs
2. Any change made to one of the package constructs
3. Any SQL statement change made to one of the package constructs
4. Removing a local variable from the DECLARE section of one of the package constructs

Procedure and Functions are explicitly executed. This is different from a database trigger. When is a database trigger executed?

1. When the transaction is committed
2. During the data manipulation statement
3. When an Oracle supplied package references the trigger
4. During a data manipulation statement and when the transaction is committed

Which Oracle supplied package can you use to output values and messages from database triggers, stored procedures and functions within SQL*Plus?

1. DBMS_DISPLAY
2. DBMS_OUTPUT
3. DBMS_LIST
4. DBMS_DESCRIBE

Examine this code

71. BEGIN
72. theater_pck.v_total_seats_sold_overall := theater_pck.get_total_for_year;
73. END;

For this code to be successful, what must be true?

1. Both the V_TOTAL_SEATS_SOLD_OVERALL variable and the GET_TOTAL_FOR_YEAR function must exist only in the body of the THEATER_PCK package.
2. Only the GET_TOTAL_FOR_YEAR variable must exist in the specification of the THEATER_PCK package.
3. Only the V_TOTAL_SEATS_SOLD_OVERALL variable must exist in the specification of the THEATER_PCK package.
4. Both the V_TOTAL_SEATS_SOLD_OVERALL variable and the GET_TOTAL_FOR_YEAR function must exist in the specification of the THEATER_PCK package.

A stored function must return a value based on conditions that are determined at runtime. Therefore, the SELECT statement cannot be hard-coded and must be created dynamically when the function is executed. Which Oracle supplied package will enable this feature?

1. DBMS_DDL
2. DBMS_DML
3. DBMS_SYN

A stored function must return a value based on conditions that are determined at runtime. Therefore, the SELECT statement cannot be hard-coded and must be created dynamically when the function is executed. Which Oracle supplied package will enable this feature?

1. DBMS_DDL
2. DBMS_DML
3. DBMS_SYN
4. DBMS_SQL

How to implement ISNUMERIC function in SQL *Plus ?

Method 1:

```
Select length (translate (trim (column_name),' +-.0123456789',' ')) from dual ;
```

Will give you a zero if it is a number or greater than zero if not numeric (actually gives the count of non numeric characters)

Method 2:

```
select instr(translate('wwww',
'abcdefghijklmnopqrstuvwxyzABCDEFGHIJKLMNOPQRSTUVWXYZ',
'XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX'),'X')
FROM dual;
```

It returns 0 if it is a number, 1 if it is not.

How to Select last N records from a Table?

```
select * from (select rownum a, CLASS_CODE,CLASS_DESC from clm)
where a > ( select (max(rownum)-10) from clm)
```

Here N = 10

The following query has a Problem of performance in the execution of the following query where the table ter.ter_master have 22231 records. So the results are obtained after hours.

```
Cursor rem_master(brepno VARCHAR2) IS
select a.* from ter.ter_master a
where NOT a.repno in (select repno from ermast) and
```

(brepno = 'ALL' or a.repno > brepno)
Order by a.repno

What are steps required tuning this query to improve its performance?
-Have an index on TER_MASTER.REPNO and one on ERMAST.REPNO

-Be sure to get familiar with EXPLAIN PLAN. This can help you determine the execution path that Oracle takes. If you are using Cost Based Optimizer mode, then be sure that your statistics on TER_MASTER are up-to-date. -Also, you can change your SQL to:

```
SELECT a.*
FROM ter.ter_master a
WHERE NOT EXISTS (SELECT b.repno FROM ermast b
WHERE a.repno=b.repno) AND
(a.brepno = 'ALL' or a.repno > a.brepno)
ORDER BY a.repno;
```

What is the difference between Truncate and Delete interms of Referential Integrity?
DELETE removes one or more records in a table, checking referential Constraints (to see if there are dependent child records) and firing any DELETE triggers. In the order you are deleting (child first then parent) There will be no problems.
TRUNCATE removes ALL records in a table. It does not execute any triggers. Also, it only checks for the existence (and status) of another foreign key Pointing to the table. If one exists and is enabled, then you will get The following error. This is true even if you do the child tables first.
ORA-02266: unique/primary keys in table referenced by enabled foreign keys
You should disable the foreign key constraints in the child tables before issuing the TRUNCATE command, then re-enable them afterwards.

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