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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.

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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 they are through 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 an 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 prohibits 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 <options>`.

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
< Less than
>= Greater than or equal
<= Less than or equal
BETWEEN an inclusive range
LIKE Search for a pattern

SELECT statements:

SELECT column_name(s) FROM table_name
SELECT DISTINCT column_name(s) FROM table_name
SELECT column FROM table WHERE column operator value
SELECT column FROM table WHERE column LIKE pattern
SELECT column,SUM(column) FROM table GROUP BY column

SELECT column,SUM(column) FROM table GROUP BY column HAVING SUM(column) condition value

Note that single quotes around text values and numeric values should not be enclosed in quotes. Double quotes may be acceptable in some databases.

The SELECT INTO Statement is most often used to create backup copies of tables or for archiving records.

SELECT column_name(s) INTO newtable [IN externaldatabase] FROM source
SELECT column_name(s) INTO newtable [IN externaldatabase] FROM source WHERE column_name operator value

The INSERT INTO Statements:

INSERT INTO table_name VALUES (value1, value2,...)
INSERT INTO table_name (column1, column2,...) VALUES (value1, value2,...)

The Update Statement:

UPDATE table_name SET column_name = new_value WHERE column_name = some_value

The Delete Statements:

DELETE FROM table_name WHERE column_name = some_value
Delete All Rows:
DELETE FROM table_name or DELETE * FROM table_name

Sort the Rows:

SELECT column1, column2, ... FROM table_name ORDER BY columnX, columnY, ..
SELECT column1, column2, ... FROM table_name ORDER BY columnX DESC
SELECT column1, column2, ... FROM table_name ORDER BY columnX DESC, columnY ASC

The IN operator may be used if you know the exact value you want to return for at least one of the columns.

SELECT column_name FROM table_name WHERE column_name IN (value1,value2,..)

BETWEEN ... AND

SELECT column_name FROM table_name WHERE column_name BETWEEN value1 AND value2
The values can be numbers, text, or dates.

What is the use of CASCADE CONSTRAINTS?

When this clause is used with the DROP command, a parent table can be dropped even when a child table exists.

Why does the following command give a compilation error?

DROP TABLE &TABLE_NAME; Variable names should start with an alphabet. Here the table name starts with an '&' symbol.

Which system tables contain information on privileges granted and privileges obtained?

USER_TAB_PRIVS_MADE, USER_TAB_PRIVS_RECD

Which system table contains information on constraints on all the tables created?obtained?

USER_CONSTRAINTS.

What is the difference between TRUNCATE and DELETE commands?

True

State true or false. !=, <>, ^= all denote the same operation?

True.

State true or false. EXISTS, SOME, ANY are operators in SQL?

True.

What will be the output of the following query?

```
SELECT REPLACE(TRANSLATE(LTRIM(RTRIM('!! ATHEN !!','!'), '!'), 'AN', '**'), '*', 'TROUBLE')  
FROM DUAL;?  
TROUBLETHETROUBLE. p>
```

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.

Which command executes the contents of a specified file?

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 an 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 reflected 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
4. DBMS_SQL

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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('www',  
'abcdefghijklmnopqrstuvwxyzaBCDEFGHIJKLMNOPQRSTUVWXYZ',  
'XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX'),'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 in terms 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.

CLIENT/SERVER

What does preemptive in preemptive multitasking mean ?

Preemptive refers to the fact that each task is allotted fixed time slots and at the end of that time slot the next task is started.

What does the OLTP stands for ?

OLTP stands for On Line Transaction Processing

What is the most important requirement for OLTP ?

OLTP requires real time response.

In a client server environment, what would be the major work that the client deals with ?

The client deals with the user interface part of the system.

Why is the most of the processing done at the sever ?

To reduce the network traffic and for application sharing and implementing business rules.

What does the term upsizing refer to ?

Applications that have outgrown their environment are re-engineered to run in a larger environment. This is upsizing.

What does one do when one is rightsizing ?

With rightsizing, one would move applications to the most appropriate server platforms.

What does the term downsizing refer to ?

A host based application is re-engineered to run in smaller or LAN based environment.

What is event trigger ?

An event trigger, a segment of code which is associated with each event and is fired when the event occurs.

Why do stored procedures reduce network traffic ?

When a stored procedure is called, only the procedure call is sent to the server and not the statements that the procedure contains.

What are the types of processes that a server runs ?

Foreground process and Background process.

What is an event handler ?

An event handler is a routine that is written to respond to a particular event.

What is an integrity constraint ?

An integrity constraint allows the definition of certain restrictions, at the table level, on the data that is entered into a table.

What are the various uses of database triggers ?

Database triggers can be used to enforce business rules, to maintain derived values and perform value-based auditing.

What is a transaction ?

A transaction is a set of operations that begin when the first DML is issued and end when a commit or rollback is issued. BEGIN COMMIT/ROLLBACK are the boundaries of a transaction.

Why are the integrity constraints preferred to database triggers ?

Because it is easier to define an integrity constraint than a database trigger.

Why is it better to use an integrity constraint to validate data in a table than to use a stored procedure ?

Because an integrity constraint is automatically checked while data is inserted into a table. A stored has to be specifically invoked.

What are the three components of a client server model ?

A Client,
A Server and
A Network/Communication software.

What are the advantages of client/server model ?

Flexibility of the system, scalability, cost saving, centralised control and implementation of business

rules, increase of developers productivity, portability, improved network and resource utilization.

What are the disadvantages of the client/server model ?

Heterogeneity of the system results in reduced reliability. May not be suitable for all applications. Managing and tuning networks becomes difficult.

What are the different topologies available for network ?

Star,
Bus,
Ring.

What is the first work of Client process ?

A client process at first establishes connection with the Server.

What are the responsibilities of a Server ?

1. Manage resources optimally across multiple clients.
2. Controlling database access and security.
3. Protecting the database and recovering it from crashes.
4. Enforcing integrity rules globally.

In a Client/Server context, what does API (Application Programming Interface) refer to ?

An API, in a Client/Server context, is a specification of a set of functions for communication between the client and the server.

Give some examples of standard API??

Open Database Connectivity (ODBC),
Integrated Database Application Programming Interface (IDAPI),
XOpen
SQL/CLI

What is the main advantage of developing an application using an API ?

The application can be connected to any back end server that is supported by the API.

What is the main disadvantage of developing an application using an API ?

The application cannot use any special features of the backend server.

Why is an event driven program referred to a passive program ?

Because an event driven program is always waiting for something to happen before processing.

What are the four types of events ?

1. System Events.
2. Control Events
3. User Events
4. Other Events.

What is the difference between file server and a database server ?

A file server just transfers all the data requested by all its client and the client processes the data while a database server runs the query and sends only the query output.

What is inheritance ?

Inheritance is a method by which properties and methods of an existing object are automatically passed to any object derived from it.

What are the two components of ODBC ?

1. An ODBC manager/administrator and
2. ODBC driver.

What is the function of a ODBC manager ?

The ODBC Manager manages all the data sources that exists in the system.

What is the function of a ODBC Driver ?

The ODBC Driver allows the developer to talk to the back end database.

What description of a data source is required for ODBC ?

The name of the DBMS, the location of the source and the database dependent information.

How is a connection established by ODBC ?

ODBC uses the description of the datasource available in the ODBC.INI file to load the required drivers to access that particular back end database.

SQL/ SQL Plus

1. How can variables be passed to a SQL routine?

Level: Low

Expected answer: By use of the & symbol. For passing in variables the numbers 1-8 can be used (&1, &2,...,&8) to pass the values after the command into the SQLPLUS session. To be prompted for a specific variable, place the ampersanded variable in the code itself:

"select * from dba_tables where owner=&owner_name;" . Use of double ampersands tells SQLPLUS to resubstitute the value for each subsequent use of the variable, a single ampersand will cause a reprompt for the value unless an ACCEPT statement is used to get the value from the user.

2. You want to include a carriage return/linefeed in your output from a SQL script, how can you do this?

Level: Intermediate to high

Expected answer: The best method is to use the CHR() function (CHR(10) is a return/linefeed) and the concatenation function "||". Another method, although it is hard to document and isn't always portable is to use the return/linefeed as a part of a quoted string.

3. How can you call a PL/SQL procedure from SQL?

Level: Intermediate

Expected answer: By use of the EXECUTE (short form EXEC) command.

4. How do you execute a host operating system command from within SQL?

Level: Low

Expected answer: By use of the exclamation point "!" (in UNIX and some other OS) or the HOST (HO) command.

5. You want to use SQL to build SQL, what is this called and give an example

Level: Intermediate to high

Expected answer: This is called dynamic SQL. An example would be:
set lines 90 pages 0 termout off feedback off verify off

```
spool drop_all.sql
select ?drop user ?||username||? cascade;? from dba_users
where username not in ("SYS?,"SYSTEM?);
spool off
```

Essentially you are looking to see that they know to include a command (in this case DROP USER...CASCADE;) and that you need to concatenate using the ||? the values selected from the database.

6. What SQLPlus command is used to format output from a select?

Level: low

Expected answer: This is best done with the COLUMN command.

7. You want to group the following set of select returns, what can you group on?

```
Max(sum_of_cost), min(sum_of_cost), count(item_no), item_no
```

Level: Intermediate

Expected answer: The only column that can be grouped on is the "item_no" column, the rest have aggregate functions associated with them.

8. What special Oracle feature allows you to specify how the cost based system treats a SQL statement?

Level: Intermediate to high

Expected answer: The COST based system allows the use of HINTs to control the optimizer path selection. If they can give some example hints such as FIRST ROWS, ALL ROWS, USING INDEX, STAR, even better.

9. You want to determine the location of identical rows in a table before attempting to place a unique index on the table, how can this be done?

Level: High

Expected answer: Oracle tables always have one guaranteed unique column, the rowid column. If you use a min/max function against your rowid and then select against the proposed primary key you can squeeze out the rowids of the duplicate rows pretty quick. For example:

```
select rowid from emp e
where e.rowid > (select min(x.rowid)
from emp x
where x.emp_no = e.emp_no);
```

In the situation where multiple columns make up the proposed key, they must all be used in the where clause.

10. What is a Cartesian product?

Level: Low

Expected answer: A Cartesian product is the result of an unrestricted join of two or more tables. The result set of a three table Cartesian product will have $x * y * z$ number of rows where x, y, z correspond to the number of rows in each table involved in the join.

11. You are joining a local and a remote table, the network manager complains about the traffic involved, how can you reduce the network traffic?

Level: High

Expected answer: Push the processing of the remote data to the remote instance by using a view to pre-select the information for the join. This will result in only the data required for the join being sent across.

12. What is the default ordering of an ORDER BY clause in a SELECT statement?

Level: Low

Expected answer: Ascending

13. What is tkprof and how is it used?

Level: Intermediate to high

Expected answer: The tkprof tool is a tuning tool used to determine cpu and execution times for SQL statements. You use it by first setting timed_statistics to true in the initialization file and then turning on tracing for either the entire database via the sql_trace parameter or for the session using the ALTER SESSION command. Once the trace file is generated you run the tkprof tool against the trace file and then look at the output from the tkprof tool. This can also be used to generate explain plan output.

14. What is explain plan and how is it used?

Level: Intermediate to high

Expected answer: The EXPLAIN PLAN command is a tool to tune SQL statements. To use it you must have an explain_table generated in the user you are running the explain plan for. This is created using the utlxplan.sql script. Once the explain plan table exists you run the explain plan command giving as its argument the SQL statement to be explained. The explain_plan table is then queried to see the execution plan of the statement. Explain plans can also be run using tkprof.

15. How do you set the number of lines on a page of output? The width?

Level: Low

Expected answer: The SET command in SQLPLUS is used to control the number of lines generated per page and the width of those lines, for example SET PAGESIZE 60 LINESIZE 80 will generate reports that are 60 lines long with a line width of 80 characters. The PAGESIZE and LINESIZE options can be shortened to PAGES and LINES.