



SQL and PL/SQL V1.0

1. What is PL/SQL?

PL/SQL stands for Procedural Language extension of SQL.

PL/SQL is a combination of SQL along with the procedural features of programming languages.

It was developed by Oracle Corporation in the early 90's to enhance the capabilities of SQL.

2. How many sections does a PL/SQL Block consists

- The Declaration section (optional).
- The Execution section (mandatory).
- The Exception (or Error) Handling section (optional).

3. What does declaration section have?

The Declaration section of a PL/SQL Block starts with the reserved keyword **DECLARE**. This section is optional and is used to declare any placeholders like variables, constants, records and cursors, which are used to manipulate data in the execution section. Placeholders may be any of Variables, Constants and Records, which stores data temporarily. Cursors are also declared in this section.

4. What does execution section have?

The Execution section of a PL/SQL Block starts with the reserved keyword **BEGIN** and ends with **END**. This is a mandatory section and is the section where the program logic is written to perform any task. The programmatic constructs like loops, conditional statement and SQL statements from the part of execution section.

5. What does exception section have?

The Exception section of a PL/SQL Block starts with the reserved keyword **EXCEPTION**. This section is optional. Any errors in the program can be handled in this section, so that the PL/SQL Blocks terminates gracefully. If the PL/SQL Block contains exceptions that cannot be handled, the Block terminates abruptly with errors. Every statement in the above three sections must end with a semicolon ; . PL/SQL blocks can be nested within other PL/SQL blocks. Comments can be used to document code.

6. How a sample pl/sql block looks like?

```
DECLARE
Variable declaration
BEGIN
Program Execution
EXCEPTION
Exception handling
END;
```

7. General Syntax to declare a constant is
constant_name CONSTANT datatype := VALUE;

8. What are records?

Records are another type of datatypes which oracle allows to be defined as a placeholder. Records are composite datatypes, which means it is a combination of different scalar datatypes

like char, varchar, number etc. Each scalar data types in the record holds a value. A record can be visualized as a row of data. It can contain all the contents of a row.

9. What are Cursors?

A cursor is a temporary work area created in the system memory when a SQL statement is executed. A cursor contains information on a select statement and the rows of data accessed by it.

This temporary work area is used to store the data retrieved from the database, and manipulate this data. A cursor can hold more than one row, but can process only one row at a time. The set of rows the cursor holds is called the active set.

10. What are the types of cursor available?

- Implicit cursors
- Explicit cursors

11. What is database Trigger?

A database trigger is a PL/SQL block that can defined to automatically execute for insert, update, and delete statements against a table. The trigger can e defined to execute once for the entire statement or once for every row that is inserted, updated, or deleted. For any one table, there are twelve events for which you can define database triggers. A database trigger can call database procedures that are also written in PL/SQL.

12. What are stored-procedures? And what are the advantages of using them?

Stored procedures are database objects that perform a user defined operation. A stored procedure can have a set of compound SQL statements. A stored procedure executes the SQL commands and returns the result to the client. Stored procedures are used to reduce network traffic.

13. What is meant by query optimization?

The phase that identifies an efficient execution plan for evaluating a query that has the least estimated cost is referred to as query optimization.

14. What is a Phantom Deadlock?

In distributed deadlock detection, the delay in propagating local information might cause the deadlock detection algorithms to identify deadlocks that do not really exist. Such situations are called phantom deadlocks and they lead to unnecessary aborts.

15. What is a checkpoint and When does it occur?

A Checkpoint is like a snapshot of the DBMS state. By taking checkpoints, the DBMS can reduce the amount of work to be done during restart in the event of subsequent crashes.

16. What is a mutating table error and how can you get around it?

This happens with triggers. It occurs because the trigger is trying to update a row it is currently using. The usual fix involves either use of views or temporary tables so the database is

selecting from one while updating the other.

17. Describe the use of %ROWTYPE and %TYPE in PL/SQL

%ROWTYPE allows you to associate a variable with an entire table row. The %TYPE associates a variable with a single column type.

18. Describe the use of PL/SQL tables

PL/SQL tables are scalar arrays that can be referenced by a binary integer. They can be used to hold values for use in later queries or calculations.

19. When is a declare statement needed ?

The DECLARE statement is used in PL/SQL anonymous blocks such as with stand alone, non-stored PL/SQL procedures. It must come first in a PL/SQL stand alone file if it is used.

20. In what order should a open/fetch/loop set of commands in a PL/SQL block be implemented if you use the %NOTFOUND cursor variable in the exit when statement?

Why?

OPEN then FETCH then LOOP followed by the exit when. If not specified in this order will result in the final return being done twice because of the way the %NOTFOUND is handled by PL/SQL.

21. How can you generate debugging output from PL/SQL?

Use the DBMS_OUTPUT package. Another possible method is to just use the SHOW ERROR command, but this only shows errors. The DBMS_OUTPUT package can be used to show intermediate results from loops and the status of variables as the procedure is executed. The new package UTL_FILE can also be used.

22. What are the types of triggers?

There are 12 types of triggers in PL/SQL that consist of combinations of the BEFORE, AFTER, ROW, TABLE, INSERT, UPDATE, DELETE and ALL key words:

BEFORE ALL ROW INSERT

AFTER ALL ROW INSERT

BEFORE INSERT

AFTER INSERT etc.

23. What steps are included in the compilation process of a PL/SQL block?

The compilation process includes syntax checking, binding, and p-code generation.

Syntax checking involves checking PL/SQL code for compilation errors. After syntax errors have been corrected, a storage address is assigned to the variables that are used to hold data for Oracle. This process is called binding. Next, p-code is generated for the PL/SQL block. P-code is a list of instructions to the PL/SQL engine. For named blocks, p-code is stored in the database, and it is used the next time the program is executed.

24. How an Implicit cursor works?

1. Any given PL/SQL block issues an implicit cursor whenever a SQL statement is executed, as long as an explicit cursor does not exist for that SQL statement.

2. A cursor is automatically associated with every DML (data manipulation) statement (UPDATE, DELETE, INSERT).

3. All UPDATE and DELETE statements have cursors that identify the set of rows that will be affected by the operation.

4. An INSERT statement needs a place to receive the data that is to be inserted into the database; the implicit cursor fulfills this need.

5. The most recently opened cursor is called the SQL cursor.

25. How an Explicit cursor works?

The process of working with an explicit cursor consists of the following steps:

1. Declaring the cursor. This initializes the cursor into memory.
2. Opening the cursor. The declared cursor is opened, and memory is allotted.
3. Fetching the cursor. The declared and opened cursor can now retrieve data.
4. Closing the cursor. The declared, opened, and fetched cursor must be closed to release the memory allocation.

26. Answer any three PL/SQL Exceptions?

Too_many_rows,
No_Data_Found,
Value_Error,
Zero_Error,
Others

27. What are PL/SQL Cursor Exceptions?

Cursor_Already_Open, Invalid_Cursor

28. What is the maximum number of triggers, can apply to a single table?

12 triggers.

29. What is a mutating table error and how can you get around it?

This happens with triggers. It occurs because the trigger is trying to update a row it is currently using. The usual fix involves either use of views or temporary tables so the database is selecting from one while updating the other

30. Describe the use of PL/SQL tables

PL/SQL tables are scalar arrays that can be referenced by a binary integer. They can be used to hold values for use in later queries or calculations. In Oracle 8 they will be able to be of the %ROWTYPE designation, or RECORD.

31. 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.

32. What is the difference between Package, Procedure and Functions?

1. A package is a database objects that logically groups related PL/SQL types, objects, and Subprograms.
2. Procedure is a sub program written to perform a set of actions and can return multiple values.
3. Function is a subprogram written to perform certain computations and return a single value. Unlike subprograms packages cannot be called, passed parameters or nested.

33. How do you make a Function and Procedure as a Private?

Functions and Procedures can be made private to a package by not mentioning their declaration in the package specification and by just mentioning them in the package body.

34. What is an Anonymous block?

Anonymous Block is a block of instructions in PL/SQL and SQL which is not saved under a name as an object in database schema It is also not compiled and saved in server storage,

so it needs to be parsed and executed each time it is run. However, this simple form of program can use variables, can have flow of control logic, can return query results into variables and can prompt the user for input using the SQL*Plus '&' feature as any stored procedure.

35. How can u create a table in PL/SQL procedure?

By using execute immediate statement we can create a table in PLSQL.

Begin

Execute immediate 'create table amit as select * from emp';

End;

All DDL,DML,DCL commands can be performed by using this command.

36. How do we Tune the Queries?

Queries can be tuned by Checking the logic (table joins), by creating Indexes on objects in the where clause, by avoiding full table scans. Finally use the trace utility to generate the trace file, use the TK-Prof utility to generate a statistical analysis about the query using which appropriate actions can be taken.

37. What are the advantages of procedures ? (Basic)

- Loaded once and used many times
- Performance better coz all SQL stmts are sent in one go from the application to the database
- Security (no object privileges are given directly)
- Invoker's rights possible
- Data integrity, productivity

38. How is a PL/SQL program stored in database ? (Advanced)

- Parsed code is stored. It's called P-code