SQL PLSQL Developer Course Outline (Oracle)

1. Basic SQL 16 classes

1. **Oracle 11g Database Configuration** – 1 class
    - Installing Oracle 11g
    - Configuring Oracle Users and Roles
    - Configuring the Sample Database
2. **RDBMS and SQL** – 1 class
    - Database Management System (DBMS)
    - Relational Database Management System (RDBMS)
    - Structured Query Language (SQL)
3. **Data Types and Constraints** – 2 classes
    - Oracle Data Types (CHAR, VARCHAR2, NUMBER, DATE, BLOB)
    - Implicit and Explicit Data Type Conversion
    - Types of Constraints (NOT NULL, UNIQUE, PRIMARY KEY, FOREIGN KEY, CHECK)
    - Defining and Modifying Constraints
4. **DDL (Data Definition Language)** – 1 class
    - CREATE
    - ALTER
    - DROP
    - RENAME
    - TRUNCATE
5. **DML (Data Manipulation Language)** – 1 class
    - INSERT
    - UPDATE
    - DELETE
6. **TCL (Transaction Control Language)** – 1 class
    - COMMIT
    - ROLLBAC
    - SAVEPOINT
7. **DRL (Data Retrieval Language) - SELECT** – 2 classes
    - Basic SELECT Query
    - Using WHERE Clause
    - Sorting Results with ORDER BY
    - Filtering Data with DISTINCT
    - Limiting Results with ROWNUM and FETCH

8. **Single Row Functions** – 4 classes
    - String Functions (e.g., CONCAT, LENGTH, SUBSTR, INSTR)
    - Numeric Functions (e.g., ROUND, CEIL, FLOOR, MOD)
    - Date Functions (e.g., SYSDATE, ADD_MONTHS, TO_DATE)
    - Conversion Functions (e.g., TO_CHAR, TO_NUMBER, TO_DATE)
    - NULL-related Functions (e.g., NVL, COALESCE, NULLIF)
9. **Aggregate Functions** – 1 class
    - COUNT
    - SUM
    - AVG
    - MAX
    - MIN
    - Using GROUP BY and HAVING with Aggregate Functions
10. **Joins** – 2 classes
    - INNER JOIN
    - OUTER JOIN (LEFT, RIGHT, FULL)
    - CROSS JOIN
    - SELF JOIN

2. Advanced SQL 14 classes

1. **Pseudo Column** – 1 class
    - ROWNUM
    - ROWID
    - SYSDATE
    - LEVEL
    - CURRVAL and NEXTVAL (for Sequences)
2. **Advanced DML** – 2 classes
    - INSERT ALL
    - UPDATE ALL
    - MERGE (Upsert Operation)
    - UPDATE with JOIN
    - DELETE with JOIN
3. **Subqueries** – 3 classes
    - Single-row Subquery
    - Multiple-row Subquery
    - Correlated Subquery
    - Nested Subquery
    - Subquery in SELECT, WHERE, and FROM clauses
4. **SET Operators** – 1 class
    - UNION
    - UNION ALL
    - INTERSECT
    - MINUS
    - Differences between UNION and UNION ALL

5. **Analytical (Window) Functions** – 2 classes
    - ROW_NUMBER()
    - RANK()
    - DENSE_RANK()
    - NTILE()
    - LEAD() and LAG()
    - FIRST_VALUE() and LAST_VALUE()
    - PERCENT_RANK()
6. **Conditional Statements** – 1 class
    - CASE Statement
    - DECODE Function
    - NVL (as a conditional function)
7. **Views** – 2 class
    - Creating Views
    - Updating Views
    - Dropping Views
    - Materialized Views
    - Advantages and Limitations of Views
8. **Sequences** – 1 class
    - Creating Sequences
    - Using Sequences with NEXTVAL and CURRVAL
    - Alter and Drop Sequences
9. **Synonyms** – 1 class
    - Creating Synonyms
    - Using Public and Private Synonyms
    - Dropping Synonyms
    - Advantages of Synonyms in SQL Queries

3. PLSQL 34 classes

1. **Getting Started with PL/SQL** – 1 class
    - Introduction to PL/SQL
    - PL/SQL Block Structure (DECLARE, BEGIN, EXCEPTION, END)
    - PL/SQL vs SQL
    - Writing and Executing Simple PL/SQL Programs
2. **Flow Control (Conditional Statements)** – 1 class
    - IF-THEN-ELSE
    - CASE
    - GOTO
    - NULL
3. **Flow Control (Iterative Statements)** – 1 class
    - LOOP
    - WHILE LOOP
    - FOR LOOP
    - EXIT and CONTINUE Statements

4. **SELECT INTO** – 1 class
    - Using SELECT INTO for Variable Assignment
    - Selecting into Record Variables
    - Handling Multiple Rows with SELECT INTO
    - Common Errors with SELECT INTO
5. **Exceptions** – 2 classes
    - Predefined Exceptions
    - User-defined Exceptions
    - EXCEPTION_INIT
    - Handling Exceptions with RAISE and RAISE_APPLICATION_ERROR
    - Exception Propagation
6. **Cursors** – 2 classes
    - Implicit Cursors
    - Explicit Cursors
    - Cursor FOR Loops
    - Cursor Variables
    - Handling Cursor Exceptions
7. **Records** – 2 classes
    - Declaring a Record Type
    - Using Records with SELECT INTO
    - %ROWTYPE vs %TYPE
    - Manipulating Record Values
8. **Procedures** – 3 classes
    - Creating and Calling Procedures
    - IN, OUT, and INOUT Parameters
    - Procedure Overloading
    - Handling Exceptions in Procedures
    - Dropping and Altering Procedures
9. **Functions** – 2 classes
    - Creating and Calling Functions
    - IN and OUT Parameters in Functions
    - Function Overloading
    - Returning Values from Functions
    - Dropping and Altering Functions
    - Procuedure vs Functions
10. **Packages** – 3 classes
    - Creating and Using Packages
    - Package Specification vs Package Body
    - Public and Private Procedures/Functions
    - Package Initialization
    - Package State (Global Variables)
    - Advantages of Packages over Procedures and Functions
11. **Triggers** – 2 classes
    - Creating Triggers
    - Types of Triggers (BEFORE, AFTER, INSTEAD OF)
    - Row-Level vs Statement-Level Triggers
    - Compound Triggers
    - Trigger Timing and Order
    - Disabling and Dropping Triggers

12. **Collections** – **3 classes**
    - Types of Collections (Associative Arrays, Nested Tables, VARRAYs)
    - Creating and Using Collections
    - Manipulating Collection Data
    - Collection Methods (COUNT, EXISTS, FIRST, LAST)
13. **Bulk Collect** – **2 classes**
    - Using BULK COLLECT to Fetch Data into Collections
    - LIMIT Clause in BULK COLLECT
    - Performance Benefits of BULK COLLECT
    - Handling Exceptions with BULK COLLECT
    - Fetching Multiple Collections in One Query
    - Using FORALL with BULK COLLECT for Efficient DML Operations
14. **Dynamic SQL** – **2 classes**
    - Introduction to Dynamic SQL
    - EXECUTE IMMEDIATE
    - Using Bind Variables with Dynamic SQL
    - Building Dynamic SQL for DML and DDL
    - Executing Dynamic SQL with RETURNING INTO
15. **Table Functions** – **2 classes**
    - Creating and Using Table Functions
    - Returning a Table from a Function
    - Using Table Functions in SQL Queries
16. **Objects** – **2 classes**
    - Creating and Using Object Types
    - Methods in Object Types
    - Using Objects in Tables (Object-Relational Features)
    - Managing Object Type Dependencies
17. **Database Links** – **1 class**
    - Creating Database Links
    - Using Database Links in Queries
    - Managing Database Links
    - Performance Considerations
18. **Autonomous Transactions** – **2 classes**
    - Using PRAGMA AUTONOMOUS_TRANSACTION
    - When to Use Autonomous Transactions
    - COMMIT and ROLLBACK inside Autonomous Transactions
    - Performance Considerations

4. Performance Tuning 16 classes

1. **Read an Execution Plan** – 2 class
    - Understanding the Execution Plan
    - How to Generate an Execution Plan
    - Interpreting Execution Plan Outputs
    - Using EXPLAIN PLAN
2. **Database Statistics** – 2 class
    - Collecting Database Statistics
    - Viewing and Interpreting Statistics
    - Using DBMS_STATS
    - Automatic vs Manual Statistics Collection
    - Analyzing and Tuning Based on Statistics
3. **Query Performance** – 2 class
    - Identifying Slow Queries
    - Optimizing Query Execution
    - Using Hints for Query Optimization
    - Common Query Performance Pitfalls
    - Analyzing Query Performance with EXPLAIN PLAN
4. **Create Indexes** – 1 class
    - Types of Indexes (B-tree, Bitmap, Clustered, etc.)
    - Creating Indexes in Oracle
    - Using Indexes to Improve Query Performance
    - Index Maintenance (Rebuilding, Dropping)
    - When Not to Use Indexes
5. **Why My Query Not Using an Index** – 1 class
    - Reasons Queries Don't Use Indexes
    - Optimizer Hints to Force Index Usage
    - Index Selectivity and Cardinality
    - Using EXPLAIN PLAN to Diagnose Index Usage
    - Resolving Common Indexing Issues
6. **Summarize Data Fast with Materialized Views** – 2 classes
    - Creating Materialized Views
    - Refreshing Materialized Views
    - Materialized View Logs
    - Performance Benefits of Materialized Views
    - When to Use Materialized Views
7. **Joins** – 1 class
    - Hash Joins
    - Nested Loops Joins
    - Merge Joins
    - Join Algorithms and Their Performance
    - Choosing the Right Join for Performance

8. **Make Inserts, Updates, and Deletes Faster** – 2 classes
    - Optimizing INSERT Performance
    - Batch Processing for Bulk Inserts
    - Optimizing UPDATE and DELETE Queries
    - Using Direct Path Inserts
    - Avoiding Locking Issues during DML Operations

9. **Find Slow SQL** – 2 classes
    - Identifying Slow SQL Queries
    - Using AWR and ASH Reports for Performance Tuning
    - SQL Trace and TKPROF
    - Using Oracle Enterprise Manager (OEM) to Find Slow SQL
    - Optimizing Slow Queries

10. **Further Reading** – 1 class
    - Books and Resources for SQL and PL/SQL Tuning
    - Oracle Documentation for Advanced Features
    - Best Practices for SQL Performance
    - Websites and Communities for Oracle Performance Tuning

✓ Course Fee

Course Name	Topics Covered	Fee
SQL only	Basic SQL, Advanced SQL – 30 classes	₹ 20,000
SQL + PLSQL	Basic SQL, Advanced SQL, PL/SQL - 64 classes	₹ 35,000
SQL + PLSQL + Performance Tuning	Basic SQL, Advanced SQL, PL/SQL, Performance Tuning - 80 classes	₹ 40,000

✓ Included

- One-to-One Sessions
- Live Session Recording
- Project-Specific Assignments
- GitHub Training Material Access