LAKSHMAN_JAVA_IT_SCHOOL

ORACLE 19c - (SQL & PL/SQL)

1. Fundamentals of Database

• What is Data Base and Why is Data Base?
• DBMS Concepts
• RDBMS Concepts
• Oracle versions
• What is oracle 12c?
• What is MULTITENANT DATABASE?
• Features in Oracle 12c
• Advantages of Oracle 12c
• What is DATA MODEL for any OLTP RDBMS?

2. STRUCURE QUERY LANGUAGE(SQL) AND CLIENT TOOLS

• What is SQL?
• Role of SQL in RDBMS
• Sub-languages in SQL
• **CLIENT INTERFACE TOOS**
• **SQL * PLUS**
• **SQL DEVELOPER**
• **PLSQL DEVELOPER**
• **TOAD**
• Oracle data types

3. SQL LANGUAGES

Data Definition Language (DDL) Commands
• CREATE
• ALTER
• TRUNCATE
• DROP
• RENAME

Data Manipulation Languages(DML) Commands
• INSERT
• UPDATE
• DELETE

Data Query Language / Retrieval Language
• SELECT

Transaction Control Languages(TCL) Commands
- ROLLBACK
- COMMIT
- SAVEPOINT

Data Control Languages(DCL) Commands
- GRANT
- REVOKE

4. DATA INTEGRITY CONSTRAINTS

- KEY Constraints
- DOMAIN Constraints
- REFERENTIAL INTEGRITY Constraints

5. OPERATORS

- Arithmetic Operators
- Relational Operators
- Relation Negation Operators
- Logical Operators
- Set Operators (Union, Union All, Intersect, Minus)

6. JOINS

- Purpose Of JOINS

- Types of JOINS

  - Cross join
  - Equi join
  - Inner Join
  - Self Join
  - Outer joins
    - left Outer join
    - Right Outer join
    - Full Outer join

7. SUB - QUERIES

- Single row sub-queries
- Multi-row sub-queries
- Correlated Sub-Queries
- Use of EXISTS / NOT EXISTS /ANY /ALL

8. SQL OBJECTS

8.1. VIEWS

• What is a view?
• Importance of View.
• Types of Views
• Simple views

- Simple views with WITH CHECK OPTION
- Simple views with WITH READ ONLY option

• Composite views
• Inline views
• Materialized views

- Read Only Materialized view
- Updatable Materialized view
- Complex Materialized view

• Force views

8.2. INDEXES

• What is a INDEX
• Necessity of Index
• Types of Indexes

- Simple Index
- Composite Index
- Bitmap Index
- Function based index

8.3. CLUSTERS

• Use of cluster
• Creation of cluster
• Advantages of clusters

8.4. SEQUENCES

• Creating sequence
• Uses of sequences

- Inserting sequence values
- Updating column with sequence values
- Altering sequence
- Using sequence value as DEFAULT value

- [from oracle 12c]

8.5. SYNONYMS

• Use of Synonym
• Types of Synonyms(PUBLIC,PRIVATE)
• How and when to create synonyms?

9. PARTITIONS

• What is partition?
• Types of partitions

- Range partition
- List partition
- Hash partition

10. SQL FUNCTIONS

Categories of Functions
• Group or Aggregate Functions
• Scalar or Single Row Functions

Types of Functions
• Numerical Functions
• String Functions
• Conversion Functions
• Date Functions
• Analytical functions

11. PL/SQL

• Introduction to PL/SQL
• What is a Program block?
• Advantages of PL/SQL.
• Architecture of PL/SQL Engine
• Features, Structure of Program Block
• Data types, Executable Stmts.
• What are the blocks in the program structure?
• DECLARE Block
• BEGIN Block
• EXCEPTION Block
• END

11.1. TYPES OF PROGRAMS

- Static Programs
- Dynamic Programs
- Worked Examples and Assignments

11.2. Type Compatibility keywords

- Declaring variables Dynamically --%TYPE
- Declaring Table Type Record Variables--%ROWTYPE

11.3. SUB PROGRAMS

Stored Procedures
- What is a procedure?
- How to create it?
- What are the advantages of procedures?
- Types of stored procedures
- Static Procedures (without Arguments)
- Dynamic Procedures (with Arguments)
- Arguments or Parameters Mode
- IN OUT INOUT

CONTOL STRUCTURES
CONDITIONAL STATEMENTS
- Simple IF
- IF—THEN—ELSE
- COMPOUND IF
- ELSIF Construct
- Worked Examples and Assignments

LOOPS
- Simple Loop
- While Loop
- For Loop

CURSORS
- Types: Implicit and Explicit cursors
- Cursor Variables
- FOR loop cursor
- Parameterized cursor
- REF_CURSOR

What is BULK COLLECT?
What is FORALL?
What is BULKBIND?

EXCEPTION HANDLING AND THEIR TYPES
• Predefined Exceptions
• User defined Exceptions
• Pragma_ Exception_init
• RISE_APPLICATION_ERROR

PL/SQL RECORDS AND TABLES
• Composite Data Types
• PL/SQL Records & Tables
• Nested Records
• Using Record in a Table
• And Examples

FUNCTIONS
• What is a Function?
• When we have to create a function?
• How to call it?
• With and without arguments

PL/SQL Collections
• VARRAYS
• Associative Arrays
• Nested tables/ PLSQL TABLES

TRIGGERS
• What is a Trigger Program?
• When we need a Trigger?
• Parts of a Trigger
• Types of Triggers
• Database Triggers
• Row Level Triggers with Ex.
• Statement Level Triggers
• Instead-of Triggers - Views with Ex.

PACKAGES
• What is a PACKAGE?
• Structure of package
• Package Spec and Body
• Accessing procedures and functions from a package

Supporting
Interview Tips
Interview Questions
Resume Preparation tips

Introduction to DBMS

- Approach to Data Management
- Introduction to prerequisites
- File and Filesystem
- Disadvantages of file
- Review of Database Management Terminology
- Database Models
- Hierarchal Model
- Network Model
- Relational Model

Sub Language Commands

- Data Definition Language (DDL)
- Data Retrieval Language (DRL)
- Data Manipulation Language (DML)
- Transaction Control Language (TCL)
- Database Security and Privileges (DCL)

Introduction to SQL Database Object

- Oracle Pre Defined Datatypes
- DDL Commands
- Create, Alter (add, modify, rename, drop)Columns, Rename, truncate, drop
- DML-Insert, update, delete
- DQL-SELECT Statements using WHEREclause
- Comparison and Conditional Operators
- Arithmetic and Logical Operators
- Set Operators (UNION, UNION ALL, INTERSECT, MINUS)
- Special Operators – IN (NOT IN), BETWEEN (NOT BETWEEN), LIKE (NOT LIKE), IS NULL (IS NOT NULL)
- Working with DML, DRL Commands
- Operators Support

Working with Integrity Constraints

- Importance of Data Integrity
- Support of Integrity Constraints for Relating Table in RDBMS
- NOT NULL constraint
- UNIQUE constraint
- PRIMARY KEY constraint
- FOREIGN KEY constraint

- CHECK constraint

- Working with different types of Integrity Constraints

Querying Multiple Tables (Joins)

- Equi Join/Inner Join/Simple Join
- Cartesian Join
- Non-Equi Join
- Outer Joins
- Self Join

Working with DCL, TCL Commands

- Grant, Revoke
- Commit, Rollback, Savepoint
- SQL Editor Commands
- SQL Environment settings

Structured Query Language (SQL)

Chapter 1: Introduction To SQL

1. Introduction Database
2. Understanding DBMS vs RDBMS
3. Gone through SQL Standards
4. Sub languages of SQL
5. Difference between 10g vs 11g vs 12c
6. Installation of 12c
7. About SQL*Plus and use of developer tool
8. Datatypes in Oracle
9. Operators in Oracle
10. Understanding Schema design and objects

Chapter 2: Data Retrieval Techniques

1. How to use select statement in different ways to retrieve records?
2. Working with Column alias
3. Working with Table alias
4. Data filtering and sorting with in single table
5. Clauses and its types in oracle

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- Where clause

- Having clause
- From clause
- Group by clause
- Order by clause
- Using clause
- Constraint clause
- For update clause

Chapter 3: Working With DDL Commands

1. Table creation using CREATE statement
2. Creating table from another table
3. Dropping a table using DROP command
4. Altering the column of a table
5. Modifying the column datatype in a table
6. Renaming the column of a table
7. Renaming an entire table
8. Using truncate command
9. Difference between Delete and Truncate command

Chapter 4: Working With DML Commands

1. How to copy data from one table to another table?
2. How to copy the structure alone from a table?
3. Different types of inserting row to an existing table
4. Updating any value of with in a record using UPDATE command
5. Deleting a particular record from a table
6. Using merge & insert all command [Implementation of Project 1]

Chapter 5: Integrity Constraints

1. How to declare column level constraints?
2. How to declare row level constraints ?
3. How to add constraints to an existing table?
4. Types of integrity constraints
- Not null
- Unique key
- Primary key
- Referential integrity
- Check integrity
5. How to enable and disable constraints?
6. How to get information about constraints?

Chapter 6: Built In Functions

1. Understanding Single row functions

2. How to use single row functions using dummy table?
3. Types of single row functions
- String functions
- Date functions
- Mathematical functions
- Conversion functions
- Special functions
- Analytical functions
4. Working with multi row functions [Implementation of Project 2]

Chapter 7: Data Aggregation

1. Working with aggregate function
- Count()
- Sum()
- Max()
- Min()
- Avg()
2. Working with group by clause
3. Working with having clause
4. Difference between WHERE and HAVING clause

Chapter 8: Importance Of JOIN

1. Understanding joins and its uses
2. Types of joins
- Equi join
- Non – equi join
- Self join
- Outer join
- Left & Right outer join
- Full outer join
- Cross join [Implementation of Project 3]

Chapter 9: Set Operators And Pseudo Columns:

- How to use set operators in a single table content?
- Working with set operator types
- UNION
- UNION ALL
- INTERSECT
- MINUS
- Working with pseudo columns using the following
- ROWID
- ROWNUM

Chapter 10: Sub Queries

1. Importance of sub queries
2. Using different types of sub queries
- Single row sub queries
- Multi row sub queries
- Nested queries
- Multi column sub queries
- Correlated sub queries
3. Using inline views and scalar queries [Implementation of Project 4]

Chapter 11: Database Transaction And Security

1. Working with data query language using TCL
2. Working with data control language commands
3. Use of commit and rollback
4. Use of savepoint and set transaction
5. How to give system privileges to an user?
6. How to invoke and revoke object privileges?
7. How to create users and roles?

Chapter 12: Design Of Schema Objects

1. Creating and working with Views
2. Working with Synonyms
3. Creating Index and clusters
4. Working with in materialized view
5. Understanding sequences and its types [Implementation of Project 5]

PL/SQL (Procedural Language Extension to SQL)

Chapter 1: Introduction To PL/SQL

1. Informal introduction to PL/SQL
2. Advantages of PL/SQL
3. Datatypes in PL/SQL
4. Program structure of PL/SQL
5. Embedding SQL statements
6. Using conditional statements and loops

Chapter 2: Creating And Using Cursors

1. What is cursor?
2. How to create cursor?
3. Using cursors in PL/SQL
4. How to create explicit cursor?

3. How to trigger a trigger?
4. Using DML trigger & DDL trigger
5. How to audit database using triggers?
6. What are database level trigger?

Chapter 8: Collections In PL/SQL

1. What is collection?
2. How to use arrays?
3. Using nested tables
4. How to use index by value?
5. Listing types of collection methods.
6. General overview and discussion about DBA Concepts

1. **Core Java**

2. **Advanced Java**

3. **Oracle**

4. **HTML & CSS**

5. **JavaScript**

6. **Boot Strap**

7. **Angular**

8. **Spring & Hibernate**

9. **Spring Boot**

10. **RESTful Services**

11. **Applications Development**