# Today's Technology Solutions
# Oracle Database Administration 11g and 12C (Course Topics)

1. **Introduction to database management systems and databases**

   - What is a database?

   - Popular database management system (DBMS) software and why Oracle DBMS.

   - History and Current trends of DBMS and Database Administration.

   - Oracle database market share and about its current competitive landscape.

   - Tasks of a Database Administrator.

2. **Relational Database Model and Installing Oracle database software**

   - Understand pre-requisites for a successful Oracle RDBMS software installation.

   - Installation of Oracle 11g R2 database software (Oracle DBMS).

   - Installation of Oracle 12c database software (Latest Release).

3. **Oracle Database Architecture**

   - Components of an Oracle database and detailed architecture.

   - Oracle database memory and process architecture.

   - Planning for an Oracle database creation.

   - Creating an Oracle database using the MANUAL method.

   - Creating an Oracle database using the Graphical Tool (Database Configuration Assistant).

   - Startup and Shutdown of a database.

   - Advance Startup and Shutdown Scenarios.

4. **Database storage**

   - Tablespaces and allocation types.

   - Create tablespaces.

   - Create datafiles with fixed size and autoextend option.

   - Control files and producing a trace output to view its contents.

   - How to rename datafiles in a controlfile.

   - Redolog File architecture and best practices.

   - Enabling Archivelog mode for a database with automatic archiving.

   - Temporary tablespaces and temporary tablespace groups (11g R2 new feature).

5. **Oracle Networking**
   - Oracle listener configuration (Dynamic and Static Listeners).
   - Dynamic Service Registration and Naming Methods configuration in sqlnet.ora.
   - Oracle database connections from other computers.
   - Using Oracle netca (Network Configuration Assistant) for network configuration file tnsnames.ora.
   - Oracle listener administration and TNS_ADMIN environment variable.
   - Database Links.

6. **User Administration and Security**
   - How to create database users.
   - How to set database profile limits for a user.
   - Unlocking a user account and enabling password management.
   - Oracle database authorization using object and system privileges.
   - Oracle database authorization using database roles.
   - How to audit Oracle DBA commands (SYS Operations).
   - How to schedule Oracle database jobs using DBMS_SCHEDULER package.

7. **Used Managed (Manual) Backup and Recovery**
   - Introduction and planning for a robust Backup and Recovery Strategy.
   - How to take an Oracle database backup in offline mode (COLD BACKUP).
   - Hot to take an Oracle database backup in online mode (HOT BACKUP).
   - How to clone a database using Cold Backup.
   - How to clone a database using Hot Backup.
   - How to recreate source database from a user-managed backup (Media failure scenario).

8. **RMAN Backup and Recovery**
   - Advantages of RMAN method compared to manual method.
   - Database backup using RMAN in normal and compressed mode.
   - Oracle database backup metadata.
   - Database backup using Recovery catalog (RMAN Catalog).
   - Querying the RMAN metadata.
   - How to clone a database using RMAN duplicate (11g R2 new feature: Backup based duplication).

- How to restore and recover a database using its backup in the event of a media failure.
- Oracle database backup retention policies and backups to Tape/offsite.
- Fast Recovery Area for better management of backups and archive log files.

## 9. Oracle Database Patching and Upgrades

- Introduction to Oracle versions and how to understand a version.
- How to upgrade from a previous release to Oracle 12c.
- How to upgrade from one patch set to another patch set within a release.
- What are one-off/interim patches?
- What are quarterly CPU patches (Cumulative Patch Updates).
- Learn about Oracle Interim Patch Installer (OPATCH).
- Upgrade a database using DBUA (database upgrade assistant) GUI tool.

## 10. Oracle 12c database creation (non-CDB) and new features

- How to create a non-CDB (traditional database) using Oracle 12c DBCA utility.
- Learn about the improvements in DBCA utility.
- How to configure and use Oracle Enterprise Manager Database Express web based tool.

## 11. Oracle 12c's Multitenant Architecture

- Understanding Container database (CDB) and Pluggable Database (PDB) in Oracle 12c release.
- How Oracle 12c CDB, PDB instance architecture differs from Oracle 11g, 10g instance architectures.
- How to create a non-CDB database in Oracle 12c (Traditional database).
- How to create a CDB database in 12c (using the multitenant feature).
- How to move (plug) the non-CDB database into the CDB database as a pluggable database (PDB).
- Real world Business use cases for using Oracle 12c Multitenant architecture.

## 12. Oracle Utilities

- Oracle database logical backups.
- Business use cases of logical backups compared to physical backups.
- Data Pump Export modes.
- Data Pump Import to import data from an export backup.
- Advanced features in Oracle Data Pump Export.

## 13.Performance Tuning

- How to handle performance issues in the real world.
- V$ views for performance monitoring and analysis.
- How to size the Oracle database memory structures for optimal performance.
- Oracle database wait events.
- Explain Oracle UNDO management internals and sizing.
- Explain Oracle TEMP space internals and sizing.
- SQL Query tracing using TKPROF.
- Database wide tracing for Oracle Errors (Event Tracing).
- Index Monitoring and internals of index maintenance by Oracle.
- Statistics data collection for Oracle database optimizer.

## 14.Real world life of an Oracle DBA

- Type of Oracle errors. Valid errors and internal exceptions (ORA-00600 and ORA-07445).
- Monitoring Oracle databases.
- How to work with Oracle Support to create Service Requests.
- Parlance and terminology used by Oracle DBAs.
- Working with Oracle Forums for issues.
- Productivity tools required when you join the work place.
- Scheduling JOBS and scripts through UNIX/LINUX crontab utility.