CS-16: RDBMS Using ORACLE

Objectives:
- To provide the basic concept, theory and practices in design and implementation of DBMS.
- To be able to handling different type of data transaction by using SQL commands.

Prerequisites:
- Theoretical as well as practical knowledge of database management system.

Unit No.	Topic	Detail
1	**DBMS Overview, SQL, SQL *PLUS**	- Introduction to DBMS and RDBMS - Dr. E. F. Codd Rules - Importance of E. R. Diagram in RDBMS - Normalization - Introduction to SQL - SQL Commands and Datatypes - Introduction to SQL *PLUS - SQL *PLUS formatting commands - Operator and Expression - SQL v/s SQL *PLUS

2	**Managing Tables and Data, Data Control and Transaction Control Command**	- Creating, Altering & Dropping tables
		- Data Manipulation Command like Insert, update, delete
		- Different type of constraints and applying of constraints
		- SELECT statement with WHERE, GROUP BY and HAVING, ORDER BY, DISTINCT, Special operators like IN, ANY, ALL, BETWEEN, EXISTS, LIKE
		- Join (Inner join ,outer join, self join)
		- subquery, minus, intersect, union
		- Built in functions
		
		    Numeric Functions: abs, ceil, cos, decode, exp, floor, greatest, least, log, max, min, rem, round , sin, sqrt, tan, trunc
		
		    Character Functions: chr, concat, initcap, lower, lpad, ltrim, replace, rpad, rtrim, substr, trim, upper
		
		    Date Functions: add_months, last_day, next_day, months_between, round (date), sysdate, trunc (date), systimestamp, to_date, to_char
		
		    Aggregate Functions: Sum, Count, AVG, MAX, MIN
		- Creating user & role
		- Grant, Revoke command
		- What is transaction?
		- Starting and Ending of Transaction Commit, Rollback,

		SavePoint
3	**Other Oracle Database Objects, Concurrency control using lock**	• View • Sequence • Synonyms • Database Links • Overview of Index and their types • Cluster • Snapshot • Locks, Overview of Locking Issues, Lock types
4	**Introduction to PL/SQL, Advanced PL/SQL**	• SQL v/s PL/SQL • PL/SQL Block structure • Language construct of PL/SQL (Variable, Basic and Composite Data Type, Conditions, Looping etc.) • %Type and %Rowtype • Using Cursor (Implicit, Explicit) • Exception Handling • Creating and Using Procedure • Package • Trigger • Creating Objects • Object in Database – Table • PL/SQL Tables, Nested Tables, Varrays
5	**Oracle Database Structure**	• Instance Architecture • Creating and Altering Database • Opening and shutdown Database • Initialization Parameter • Control Files, Redo Log Files • Concept of Tablespace • Rollback Segment • Import • Export • SQL *Loader

Seminar   - 5 Lectures
Expert Talk   - 5 Lectures (Managing a Multitenant Environment using Oracle 12c)
Test   - 5 Lectures

Total Lectures 60 + 15 = 75

Reference Books:

- Oracle Database 12c The Complete Reference (Oracle Press) by Bob Bryla , Kevin Loney – Oracle Press
- Oracle Database 12c SQL – Jason Price – Oracle Press
- Oracle Database 12c PL/SQL Programming by McLaughlin – Oracle Press
- SQL, PL/SQL The programming - Lang.Of Oracle Ivan Bayross – BPB

Course outcomes:
- Describe the fundamentals of data design and relation database concepts
- Design entity-relationship diagrams to represent database application scenarios
- Develop relational database
- Apply normalization techniques on relational database
- Describe the knowledge of transaction processing and various concurrency problems
- Apply knowledge of SQL queries to perform various database related operations
- Develop various PL/SQL programs