B.TECH. CSE with specialization in Oracle Technologies

Departmental Elective-I	Oracle Database 11g: SQL Fundamentals I (BCS 047)
Departmental Elective-II	Oracle Database 11g: SQL Fundamentals II (BCS 057)
Departmental Elective-III	Oracle 11 g: Administration Workshop I (BCS 067)
Departmental Elective-IV	Oracle 11 g: Admistration Workshop II (BCS 076)
Open Elective	Java SE7 (EOE 076)
Departmental Elective-V	Web Component Development with Serve lets and JSPs BCS 086)
Departmental Elective-VI	Java Advanced (BCS 090)

Department Elective-I

BCS-047: Oracle Database 11g: SQL Fundamentals I

L T P **Credit-4**

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UNIT I **08 hours**

Introduction: Course Objectives, Overview of relational database management concepts and terminologies, Introduction to SQL and its development environments, The Human Resource (HR) Schema

Retrieving Data using the SQL SELECT Statement: Capabilities of the SELECT statement, Arithmetic expressions and NULL values in the SELECT statement, Column aliases, Use of concatenation operator, literal character strings, alternative quote operator, and the DISTINCT keyword, Use of the DESCRIBE command

UNIT II **08 hours**

Restricting and Sorting Data: Limiting the Rows, Rules of precedence for operators in an expression, Substitution Variables, Using the DEFINE and VERIFY command.

Using Single-Row Functions to Customize Output: Describe the differences between single row and multiple row functions, Manipulate strings with character function in the SELECT and WHERE clauses, Manipulate numbers with the ROUND, TRUNC and MOD functions, Perform arithmetic with date data, Manipulate dates with the date functions

UNIT III **08 hours**

Using Conversion Functions and Conditional Expressions: Describe implicit and explicit data type conversion, Use the TO_CHAR, TO_NUMBER, and TO_DATE conversion functions, Nest multiple functions, Apply the NVL, NULLIF, and COALESCE functions to data, Use conditional IF THEN ELSE logic in a SELECT statement

Reporting Aggregated Data Using the Group Functions: Group Functions, Creating Groups of Data,Restricting Group Results

UNIT IV **08 hours**

Displaying Data from Multiple Tables Using Joins: Introduction to JOINS, Types of Joins, Natural join,Self-join,Non equi-joins,OUTER join

Using Subqueries to Solve Queries: Introduction to Subqueries,Single Row Subqueries,Multiple Row Subqueries

UNIT V **08 hours**

Using the SET Operators: Set Operators,UNION and UNION ALL operator,INTERSECT operator,MINUS operator,Matching the SELECT statements,Using ORDER BY clause in set operations

Managing Tables using DML statements: Data Manipulation Language,Database Transactions

Introduction to Data Definition Language: Data Definition Language

Reference Books:

1. Korth, Silberschatz, ―Database System Concepts‖, 4th Ed., TMH, 2000.

2.Steve Bobrowski, ―Oracle & Architecture‖, TMH, 2000

Department Elective-II

BCS-057: Oracle Database 11g: SQL Fundamentals II

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Unit –I **08 hours**

Introduction to Data Dictionary Views: Introduction to Data Dictionary, Describe the Data Dictionary Structure, Using the Data Dictionary views, Querying the Data Dictionary Views

Creating Sequences, Synonyms, Indexes: Overview of sequences, Overview of synonyms, Overview of indexes

Creating Views: Overview of views

Unit –II **08 hours**

Managing Schema Objects: Managing constraints,Creating and using temporary tables,Creating and using external tables

Retrieving Data by Using Subqueries: Retrieving Data by Using a Subquery as Source, Working with Multiple-Column subqueries,Using Scalar subqueries in SQL,Correlated Subqueries,Working with the WITH clause

Unit- III **08 hours**

Manipulating Data by Using Subqueries: Using Subqueries to Manipulate Data, Inserting by Using a Subquery as a Target, Using the WITH CHECK OPTION Keyword on DML Statements, Using Correlated Subqueries to Update and Delete rows

Controlling User Access: Systemprivileges, Creating a role, Objectprivileges, Revoking object privileges

Manipulating Data: Overview of the Explicit Default Feature, Using multitable Inserts, Using the MERGE statement, Performing flashback operations, Tracking Changes in Data,

Managing Data in Different Time Zones: Working with CURRENT_DATE, CURRENT_TIMESTAMP,and LOCALTIMESTAMP

Unit –IV **08 hours**

Oracle Database 11g: Controlling User Access and Managing Schema Objects: Controlling User Access, Managing Schema Objects

Oracle Database 11g: Data Dictionary Views and Large Data Sets: Managing Objects with Data Dictionary Views, Manipulating Large Data Sets

Unit –V

Oracle Database 11g: Managing Data in Different Time Zones: Using Time Zones and Date time Functions

Oracle Database 11g: Using Subqueries and Regular Expressions: Retrieving Data Using Subqueries,Using Regular Expressions

Reference Books:

1. Korth, Silberschatz, ―Database System Concepts‖, 4th Ed., TMH, 2000.

2.Steve Bobrowski, ―Oracle & Architecture‖, TMH, 2000

Department Elective-III

BCS-067: Oracle 11 g: Administration Workshop I

L T P **Credit-4**

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UNIT-I **08 hours**

Exploring the Oracle Database Architecture: Oracle Database Architecture Overview,Oracle ASM Architecture Overview,Process Architecture,Memory structures,Logical and physical storage structures,ASM storage components

Installing your Oracle Software: Tasks of an Oracle Database Administrator,Tools Used to Administer an Oracle Database,Installation: System Requirements,Oracle Universal Installer (OUI),Installing Oracle Grid Infrastructure,Installing Oracle Database Software,Silent Install

Creating an Oracle Database: Planning the Database,Using the DBCA to Create a Database,Password Management,Creating a Database Design Template,Using the DBCA to Delete a Database.

UNIT-II **08 hours**

Managing the Oracle Database Instance: Start and stop the Oracle database and components,Use Oracle Enterprise Manager,Access a database with SQLPlus,Modify database installation parameters,Describe the stages of database startup,Describe database shutdown options,View the alert log,Access dynamic performance views

Manage the ASM Instance: Set up initialization parameter files for ASM instance,Start up and shut down ASM instances,Administer ASM disk groups

Configuring the Oracle Network Environment: Use Enterprise Manager to create and configure the Listener,Enable Oracle Restart to monitor the listener,Use tnsping to test Oracle Net connectivity,Identify when to use shared servers and when to use dedicated servers.

UNIT-III **08 hours**

Managing Database Storage Structures: Storage Structures,How Table Data Is Stored,Anatomy of a Database Block,Space Management in Tablespaces,Tablespaces in the Preconfigured Database,Actions with Tablespaces,Oracle Managed Files (OMF)

Administering User Security: Database User Accounts,Predefined Administrative Accounts,Benefits of Roles,Predefined Roles,Implementing Profiles

Managing Data Concurrency: Data Concurrency,Enqueue Mechanism,Resolving Lock Conflicts,Deadlocks,

Managing Undo Data: Data Manipulation,Transactions and Undo Data,Undo Data Versus Redo Data,Configuring Undo Retention

UNIT-IV **08 hours**

Implementing Oracle Database Auditing: Describe DBA responsibilities for security,Enable standard database auditing,Specify audit options,Review audit information,Maintain the audit trail

Database Maintenance: Manage optimizer statistics,Manage the Automatic Workload Repository (AWR),Use the Automatic Database Diagnostic Monitor (ADDM),Describe and use the advisory framework,Set alert thresholds,Use server-generated alerts,Use automated tasks

Performance Management: Performance Monitoring,Managing Memory Components,Enabling Automatic Memory Management (AMM),Automatic Shared Memory Advisor,Using Memory Advisors,Dynamic Performance Statistics,Troubleshooting and Tuning Views,Invalid and Unusable Objects.

UNIT-V **08 hours**

Backup and Recovery Concepts: Part of Your Job,Statement Failure,User Error,Understanding Instance Recovery,Phases of Instance Recovery,Using the MTTR Advisor,Media Failure,Archive Log Files

Performing Database Backups: Backup Solutions: Overview,Oracle Secure Backup,User-Managed Backup,Terminology,Recovery Manager (RMAN),Configuring Backup Settings,Backing Up the Control File to a Trace File,Monitoring the Flash Recovery Area

Performing Database Recovery: Opening a Database,Data Recovery Advisor,Loss of a Control File,Loss of a Redo Log File,Data Recovery Advisor,Data Failures,Listing Data Failures,Data Recovery Advisor Views

Reference Books:

1. Date C. J., ―An Introduction to Database Systems‖, 7th Ed., Narosa Publishing, 2004
2. Elmsari and Navathe, ―Fundamentals of Database Systems‖, 4th Ed., A. Wesley, 2004
3. Ullman J. D., ―Principles of Database Systems‖, 2nd Ed., Galgotia Publications, 1999.

Department Elective-IV

BCS-076: Oracle 11 g: Admiration Workshop II

L T P **Credit-4**

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UNIT-I **08 hours**

Oracle Database 11g Release 2: Database Architecture and Recovery Operations: Oracle Database Architecture, Backup and Recovery Operations.

Oracle Database 11g Release 2: The RMAN Catalog and Creating Backups: The RMAN Recovery Catalog, Creating Backups with RMAN.

UNIT-II **08 hours**

Oracle Database 11g Release 2: Performing Restore and Recovery Tasks: Restore and Recovery Tasks, Performing User-Managed Backup and Recovery.

Oracle Database 11g Release 2: Using, Monitoring and Tuning RMAN: Using RMAN to Perform Recovery, Monitoring and Tuning RMAN.

UNIT-III **08 hours**

Oracle Database 11g Release 2: Database Diagnostics and Flashback Technologies: Diagnosing the Oracle Database, Flashback Technologies.

Oracle Database 11g Release 2: Managing Database Memory and Performance: Managing Memory, Managing Database Performance.

UNIT-IV **08 hours**

Oracle Database 11g Release 2: Managing Database Resources and the Scheduler: Managing Resources, Task Automation and Administration.

UNIT-V **08 hours**

Oracle Database 11g Release 2: Managing Database Space and Duplication: Oracle Database 11g Release 2: Managing Database Space and Duplication, Duplicate Databases.

1. **Reference Books:** Date C. J., ―An Introduction to Database Systems‖, 7th Ed., Narosa Publishing, 2004
2. Elmsari and Navathe, ―Fundamentals of Database Systems‖, 4th Ed., A. Wesley, 2004
3. Ullman J. D., ―Principles of Database Systems‖, 2nd Ed., Galgotia Publications, 1999.

Open Elective

BOE-076Java SE7 Fundamentals

L T P **Credit-4**

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UNIT-I **08 hours**

Introducing the Java Technology: Relating Java with other languages, Showing how to download, install, and configure the Java environment on a Windows system, Describing the various Java technologies such as Java EE, JavaME, Embedded Java SE, Describing key features of the technology and the advantages of using Java, Using an Integrated Development Environment (IDE).

Thinking in Objects: Defining the problem domain, Identifying objects and recognizing the criteria for defining objects.

Introducing the Java Language: Defining classes ,Identifying the components of a class, Creating and using a test class, Compiling and executing a test program.

UNIT-II **08 hours**

Working with Primitive Variables: Declaring and initializing field variables, Describing primitive data types such as integral, floating point, textual, and logical, Declaring variables and assigning values, Using constants, Using arithmetic operators to modify values.

Working with Objects: Declaring and initializing objects, Storing objects in memory, Using object references to manipulate data, Using JSE javadocs to look up the methods of a class, working with String and StringBuilder objects.

Using operators and decision constructs: Using relational and conditional operators, Testing equality between strings, Evaluating different conditions in a program and determining the algorithm, Creating if and if/else constructs, Nesting and chaining conditional statements, Using a switch statement.

UNIT-III **08 hours**

Creating and Using Arrays: Declaring, instantiating, and initializing a one-dimensional Array, Declaring, instantiating, and initializing a two-dimensional Array, Using a for loop to process an Array, Creating and initializing an ArrayList, Using the import statement to work with existing Java APIs, Accessing a value in an Array or and ArrayList, Using the args Array.

Using Loop Constructs: Creating while loops and nested while loops, Developing a for loop, Using ArrayLists with for loops, Developing a do while loop, Understanding variable scope.

UNIT-IV **08 hours**

Working with Methods and Method Overloading: Creating and Invoking a Method, Passing arguments and returning values, Creating static methods and variables, Using modifiers, Overloading a method.

Using Encapsulation and Constructors: Creating constructors, Implementing encapsulation.

Introducing Advanced Object Oriented Concepts: Using inheritance, Using types of polymorphism such as overloading, overriding, and dynamic binding, Working with superclasses and subclasses, Adding abstraction to your analysis and design, Understanding the purpose of Java interfaces, Creating and implementing a Java interface.

UNIT-V **08 hours**

Handling Errors: Understanding the different kinds of errors that can occur and how they are handled in Java, Understanding the different kinds of Exceptions in Java, Using Javadocs to research the Exceptions thrown by the methods of foundation classes, Writing code to handle Exceptions.

The Big Picture: Creating packages and JAR files for deployment using java, Two and three tier architectures, Looking at some Java applications examples.

Reference Books:

1. "Advanced Java 2 Platform HOW TO PROGRAM" by H. M.Deitel, P. J. Deitel, S. E. Santry – PrenticeHall

2. "Beginning Java™ EE 6 Platform with GlassFish 3 From Novice to Professional" by Antonio Goncalves– Apress publication

Department Elective-V

BCS-086: Web Component Development with Serve lets and JSPs

L T P **Credit-4**

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UNIT-I **08 hours**

Web Application Essentials: Describing Java Servlet Technology, Describing Java Server Pages Technology,Understanting the Model-View-Controller (MVC) Architecture, Explaining Java EE Containers and Java Application Servers, Describing the Web Application Development Process,Identifying the Essential Structure of a WAR File.

Developing a Servlet: Describing the HTTP Headers and Their Function,Explaining the Request and Response Processes,Understanding the Life Cycle of a Servlet,Listing Injection and Lifecycle Method Annotations,Understanding the Threading Model of a Servlet,Developing a Servlet to Respond to Requests from the Client Browser.

UNIT-II **08 hours**

Handling Form Requests in Servlets: Using HTML Forms To Collect Data From Users and Send it To a Servlet,Understanding How Form Data Is Sent in an HTTP Request,Developing a Servlet that Retrieves Form Parameters,Understanding and Using HttpSession Objects,Using Cookies for Session Management,Using URL Rewriting for Session Management.

Configuring Your Web Application: Describing the Purpose of Deployment Descriptors,Creating Servlet Mappings to Allow Invocation of a Servlet,Creating and Access Context and Init Parameters,Using the @WebServlet and @WebInitParam Annotations,Using the ServletContextListener Interface,Describing the Different Scopes in a Web Application,Handling Errors Using a Deployment Descriptor.

UNIT-III **08 hours**

Implementing an MVC Design: Implementing the Controller Design Element Using a Servlet,Implementing the Model Design Element Using a POJO,Implementing the View Design Element Using a JSP and Expression Language (EL),Connecting the model, View, and Controller Elements to Implement a Working MVC Solution,Injecting a Service in a Controller,

Developing Components with JavaServer Pages Technology: Describing JSP Page Technology,Writing JSP ,Code Using Scripting Elements,Writing JSP Code Using the Page Directive,Writing JSP Code Using Standard Tags,Writing JSP code using Expression Language,Configuring the JSP Page Environment in the web.xml File,Writing an Error Page by Using JSP

Developing JSP Pages by Using Custom Tags: Designing JSP Pages with Custom Tag Libraries,Using a Custom Tag Library in JSP Pages,Describing JSTL Tags

UNIT-IV **08 hours**

Using Filters in Web Applications: Describing the Web Container Request Cycle,Describing the Filter API,Developing a Filter Class,Configuring a Filter in the web.xml File

More Servlet Features: Using the Asynchronous Servlet Mechanism,Using JavaScript to Send an HTTP Request from a Client,Processing an HTTP Response Entirely in JavaScript,Combining These Techniques to Create the Effect of Server-push,Handling Multipart Form Data

UNIT-V **08 hours**

Implementing Security: Describing a Common Failure Mode in Security,Requiring that a User Log in Before Accessing Specific Pages in Your Web Application,Describing the Java EE Security Model,Requiring SSL Encrypted Communication for Certain URLs or Servlets

Integrating Web Applications with Databases: Understanding the Nature of the Model as a Macro-pattern,Implementing Persistent Storage for Your Web Applications Using JDBC or Java Persistence API

Reference Books:

1. "Advanced Java 2 Platform HOW TO PROGRAM" by H. M.Deitel, P. J. Deitel, S. E. Santry – PrenticeHall

2. "Beginning Java™ EE 6 Platform with GlassFish 3 From Novice to Professional" by Antonio Goncalves– Apress publication

DEPARTMENTAL ELECTIVE -VI

BCS-090: Java Advanced

L T P **Credit-4**

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UNIT-I **08 hours**

Collections: Collection Interfaces, Concrete Collections, The Collections Framework. **Multithreading :** Creating thread and running it, Multiple Thread acting on single object, Synchronization, Thread communication, Thread group, Thread priorities, Daemon Thread, Life Cycle of Thread.

UNIT-II **08 hours**

Networking: Internet Addressing, InetAddress, Factory Methods, Instance Methods, TCP/IP Client Sockets, URL, URL Connection, TCP/IP Server Sockets, Datagrams.

Enterprise Java Bean: Preparing a Class to be a Java Bean, Creating a Java Bean, Java Bean Properties,
Types of beans, State full Session bean, Stateless Session bean, Entity bean.

UNIT-III **08 hours**

Java Database Connectivity (JDBC): Merging Data from Multiple Tables: Joining, Manipulating , Databases with JDBC, Prepared Statements, Transaction Processing, Stored Procedures .

Servlets: Servlet Overview and Architecture, Interface Servlet and the Servlet Life Cycle, Handling ,HTTP get Requests, Handling HTTP post Requests, Redirecting Requests to Other Resources, Session Tracking, Cookies, Session Tracking with Http Session
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UNIT-IV **08 hours**

Java Server Pages (JSP): Introduction, Java Server Pages Overview, A First Java Server Page Example, Implicit Objects, Scripting, Standard Actions, Directives, Custom Tag Libraries

Remote Method Invocation: Defining the Remote Interface, Implementing the Remote Interface, Compiling and Executing the Server and the Client.

UNIT-V **08 hours**

Common Object Request Broker Architecture (CORBA): Technical/Architectural Overview, CORBA Basics, CORBA services

Introduction Smart Phone Application Development: Introduction to android platform, Creating application template, adding activity, intent, services to application, using Google map API

Reference Book:

1. "Advanced Java 2 Platform HOW TO PROGRAM" by H. M.Deitel, P. J. Deitel, S. E. Santry – PrenticeHall

2. "Beginning Java™ EE 6 Platform with GlassFish 3 From Novice to Professional" by Antonio Goncalves– Apress publication