AHMEDABAD UNIVERSITY

SCHOOL OF COMPUTER STUDIES

Master of Computer Applications (M.C.A.) – W.E.F. June, 2013

Second Year Integrated MCA **Semester-IV**

Subject Code: MCA5_244	**Subject Name:** Advanced Database Management System
Lectures per week (hours):	3
Practicals per week (hours)	2
Internal Evaluation	50 Marks
External Evaluation	50 Theory + 50 Practical Marks
Total Credits	4

Prerequisites: Basic concepts of Database Management System

Aim:

The course is aimed to develop the techniques and skills of database designing which can be applied in real time software development.

Objectives:

(1) To understand the importance of database design.
(2) To gain knowledge of basic and advanced concepts of relational database.
(3) To develop skills of writing queries and basic programs in fourth generation language SQL by using a relational database management system named ORACLE.
(4) To make students familiar with the advanced database concepts such as transaction processing, database recovery and security.

Learning Outcomes:

Unit I	**Design Concepts of the Relational Database Model** Introduction to RDBMS, Importance of database design, Problems with the file system data management, DBMS functions, Data models, 3-tier architecture of DBMS, Types of keys, Integrity rules; Relational set operators, Data dictionary	9	12
Unit II	**E-R modeling and Normalization** Entity-Relationship modeling and its examples, The need for normalization, The normalization process: Conversion to First, Second and Third normal forms, Surrogate key considerations; Denormalization.	9	13

Unit III	**Advanced Database Concepts** Transaction management : Transaction properties; Transaction log, Concurrency control problems : lost update; uncommitted data; inconsistent retrieval, Locking methods : Binary lock; Shared/Exclusive locks, Database backup and recovery; Database security, integrity and authorization, Overview of centralized and distributed database management system; Advancements in databases	9	12
Unit IV	**Implementation with SQL and PL/SQL** Data types, Data definition commands, Data manipulation commands; Types of constraints, Special operators, Joining tables, Views, Date functions, Conversion function, Mathematical functions, Aggregate functions, String functions, PL/SQL block, Cursors, Stored Procedure and Function, Trigger	9	13
	Total	**36**	**50**

Learning Outcomes:

Upon the completion of this course, the student will be able to:

1. Use the basic and advanced concepts of the database management system to design and create the database table structures of any real time application by applying concepts of entity-relationship and normalization efficiently.
2. Solve any query by using the fourth generation language SQL and write small programs with Procedural SQL in the DBMS ORACLE.
3. Know the importance of transaction management and concurrency control during simultaneous execution of transactions.

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Practicals per week (hours) 2

Total Marks (Practical Exam) 50 Marks

Topics to be covered in Practical Sessions

Total Marks: 50

Sr. No.	Topics to be Covered	No. of Practicals
1.0	**SQL** 1.1 Select queries 1.2 Advanced select queries 1.3 SQL functions 1.3.1 Date and time functions 1.3.2 String functions 1.3.3 Numeric functions 1.3.4 Conversion functions	6
2.0	**Advanced SQL** 2.1 Virtual table : View 2.2 Joining database tables 2.3 Relational set operators : Union, Intersect, Minus 2.4 Sub queries	6
3.0	**PL/SQL** 3.1 Creating Pl/SQL block 3.2 Working with Cursors 3.3 Stored procedure 3.4 Stored function	12
	Total	**24**

Prescribed Reference Books:

(1) Shefali Naik, "Concepts of Database Management System", Pearson Education, First Edition, 2014
(2) Peter Rob and Carlos Coronel, "Database Systems : Design, Implementation and Management", Thomson Course Technology, Seventh Edition, 2007
(3) S.K. Singh, "Database Systems : Concepts, Design and Applications", Pearson Education, Third Edition, 2009
(4) Ivan Bayross, "SQL, PL/SQL : The Programming Language of ORACLE", BPB Publications, Fourth Edition, 2010

Additional Reference Books/Resources:

(1) Ramez Elmasri and Sham Kent Navathe, "Fundamentals of Database Systems", Pearson Education, Fifth Edition, 2004
(2) Atul Kahate, "Introduction to Database Management System", Pearson Education, Third Edition, 2009
(3) Nilesh Shah, "Database Systems Using Oracle", PHI Pvt. Ltd., Second Edition, 2005