SARDAR VALLABHBHAI PATEL EDUCATION SOCIETY'S
R. N. G. PATEL INSTITUTE OF TECHNOLOGY - RNGPIT
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**Program Name: Int. M.Sc. (I.T.)**

**Level: Post Graduate**

**Branch: Information Technology**

**Subject Code: 1BS303**

**Subject Name: Relational Database Management System RDBMS**

| | |
|---|---|
| w. e. f. Academic Year: | 2025-26 |
| Semester: | 03 |
| Category of the Course: | Major Course |

| | |
|---|---|
| **Prerequisite:** | DBMS |
| **Rationale:** | This course covers basic understanding of relational database management systems, overview of PL/SQL, cursors, triggers, stored procedures, functions. |

**Course Outcome:**

After Completion of the Course, Student will be able to:

| No | Course Outcomes |
|---|---|
| 01 | Describe Codd's Rules and relational algebra operations. |
| 02 | Perform Advanced SQL concept and query. |
| 03 | Explore the concept of PL/SQL block and control structure. |
| 04 | Demonstrate the use of cursors in PL/SQL for managing data. |
| 05 | Implement triggers in PL/SQL for efficient database management. |
| 06 | Utilize functions and stored procedures for real world problems. |

**Teaching and Examination Scheme:**

| Teaching Scheme (in Hours) | | | Total Credits L+T+ (PR/2) | Assessment Pattern and Marks | | | | Total Marks |
|---|---|---|---|---|---|---|---|---|
| | | | | Theory | | Tutorial / Practical | | |
| L | T | PR | C | SEE (TH) | IAT | CCE | SEE (P) | |
| 2 | 0 | 4 | 4 | 70 | 30 | 20 | 30 | 150 |

Where SEE: Semester End Examination, IAT: Internal Assessment Test, CCE: Continuous and Comprehensive Evaluation

**Course Content:**

| Unit No. | Content | No. of Hours | % of Weightage |
|---|---|---|---|
| 1 | **Unit-1 Introduction of Relational model**<br>1.1 Codd's Rules<br>1.2 Relational operations Algebra<br>1.3 Transaction control language<br>1.4 Data Control language | 4 | 15 |
| 2 | **Unit-2 Advanced SQL**<br>2.1 Data types<br>2.2 ROWID pseudo column & DUAL table<br>2.3 DATE Functions<br>2.4 Concepts of Index<br>2.5 Join Queries<br>2.6 Nested Queries | 4 | 15 |
| 3 | **Unit-3: PL/SQL and Conditional Statements**<br>3.1 Introduction to PL/SQL<br>3.2 Variables, Constants and Data Type<br>3.3 Assigning Values to Variables<br>3.4 User Defined Record<br>3.5 Conditional Statements<br>3.6 Iterative statements | 7 | 20 |
| 4 | **UNIT 4: Introduction to Cursor**<br>4.1 Introduction to Cursor<br>4.2 Types of Cursors<br>4.3 Cursor Declaration<br>4.4 Cursors Operations<br>4.5 Advantages and Disadvantages of Cursor | 4 | 15 |
| 5 | **UNIT 5: Concepts of Triggers**<br>5.1 Introduction to Triggers | 4 | 15 |

| | | | |
|---|---|---|---|
| | 5.2 Types of Triggers<br>5.3 Trigger Events<br>5.4 Trigger Creation<br>5.5 Advantages and Disadvantages of Trigger | | |
| **6** | **UNIT 6: Function and Stored Procedure:**<br>6.1 Introduction to Function and Procedure<br>6.2 Creation of Function and Procedure<br>6.3 Calling of Function and Procedure<br>6.4 Advantages and Disadvantages of Function and Procedure | 7 | 20 |
| | **Total** | **30** | **100** |

| **Distribution of Theory Marks (%)** | | | | | |
|---|---|---|---|---|---|
| **R Level** | **U Level** | **A Level** | **N Level** | **E Level** | **C Level** |
| **20** | **40** | **40** | **-** | **-** | **-** |

**Suggested Specification Table with Marks (Theory):**
Where R: Remember; U: Understanding; A: Application, N: Analyze and E: Evaluate C: Create (as per Revised Bloom's Taxonomy)

**References/Suggested Learning Resources:**

**(a) Books:**

1. Database Management Systems by Raghu ramakrishnan and Johannes Gehrke
2. SQL in 10 Minutes, Sams Teach Yourself by Ben Forta
3. Oracle Database 12c SQL by Jason Price
4. PL/SQL: The Definitive Guide by Jonathan Gennick
5. SQL Performance Explained by Markus Winand

**(b) Open-source software and website:**

1. https://www.mysql.com/
2. https://www.postgresql.org/
3. https://www.sqlite.org/
4. https://firebirdsql.org/
5. https://db.apache.org/derby/

**Suggested Course Practical List:**

| Sr. No. | Name of Practical |
|---|---|
| **1.** | Write an SQL query to find the second highest salary from the "Employees" table. |
| **2.** | Create a table named "Customers" with the following columns: CustomerID (int, primary key), Name (varchar), Email (varchar), DateOfBirth (date), and Phone (varchar). |
| **3.** | Write a query to retrieve the names of all employees who have worked on a project, including the project name. (Use the "Employees" and "Projects" tables.) |
| **4.** | Given a set of unnormalized data (e.g., a table storing customer orders with multiple products in one record), normalize the data to 1NF (First Normal Form). |
| **5.** | Create a trigger that automatically updates the "last_updated" timestamp in the "Employees" table whenever an employee's salary is updated. |
| **6.** | Write an explicit cursor to fetch all employees' names and salaries from the "Employees" table and display them. |
| **7.** | Create a stored function to calculate the total salary for an employee given their EmployeeID. |
| **8.** | Write a transaction block to transfer money from one account to another (with proper rollback in case of error). |
| **9.** | Create a stored procedure to delete a customer's record from the "Customers" table only if no orders are placed by that customer. |
| **10.** | Write a query to get the list of all customers who have not placed any orders from the "Customers" and "Orders" tables. |

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