

**DBMS LABORATORY WITH MINI PROJECT**  
**[As per Choice Based Credit System (CBCS) scheme]**  
**(Effective from the academic year 2016 -2017)**

**SEMESTER – V**

Subject Code	15CSL58	IA Marks	20
Number of Lecture Hours/Week	01I + 02P	Exam Marks	80
Total Number of Lecture Hours	40	Exam Hours	03

**CREDITS – 02**

**Course objectives:** This course will enable students to

- Foundation knowledge in database concepts, technology and practice to groom students into well-informed database application developers.
- Strong practice in SQL programming through a variety of database problems.
- Develop database applications using front-end tools and back-end DBMS.

**Description (If any):**

**PART-A: SQL Programming (Max. Exam Mks. 50)**

- Design, develop, and implement the specified queries for the following problems using Oracle, MySQL, MS SQL Server, or any other DBMS under LINUX/Windows environment.
- Create Schema and insert at least 5 records for each table. Add appropriate database constraints.

**PART-B: Mini Project (Max. Exam Mks. 30)**

- Use Java, C#, PHP, Python, or any other similar front-end tool. All applications must be demonstrated on desktop/laptop as a stand-alone or web based application (Mobile apps on Android/IOS are not permitted.)

**Lab Experiments:**

**Part A: SQL Programming**

- 1 Consider the following schema for a Library Database:  
 BOOK(Book\_id, Title, Publisher\_Name, Pub\_Year)  
 BOOK\_AUTHORS(Book\_id, Author\_Name)  
 PUBLISHER(Name, Address, Phone)  
 BOOK\_COPIES(Book\_id, Branch\_id, No-of\_Copies)  
 BOOK\_LENDING(Book\_id, Branch\_id, Card\_No, Date\_Out, Due\_Date)  
 LIBRARY\_BRANCH(Branch\_id, Branch\_Name, Address)  
 Write SQL queries to
  1. Retrieve details of all books in the library – id, title, name of publisher, authors, number of copies in each branch, etc.
  2. Get the particulars of borrowers who have borrowed more than 3 books, but from Jan 2017 to Jun 2017.
  3. Delete a book in BOOK table. Update the contents of other tables to reflect this data manipulation operation.
  4. Partition the BOOK table based on year of publication. Demonstrate its working with a simple query.
  5. Create a view of all books and its number of copies that are currently available in the Library.
- 2 Consider the following schema for Order Database:  
 SALESMAN(Salesman\_id, Name, City, Commission)  
 CUSTOMER(Customer\_id, Cust\_Name, City, Grade, Salesman\_id)  
 ORDERS(Ord\_No, Purchase\_Amt, Ord\_Date, Customer\_id, Salesman\_id)  
 Write SQL queries to
  1. Count the customers with grades above Bangalore's average.

	<ol style="list-style-type: none"> <li>Find the name and numbers of all salesman who had more than one customer.</li> <li>List all the salesman and indicate those who have and don't have customers in their cities (Use UNION operation.)</li> <li>Create a view that finds the salesman who has the customer with the highest order of a day.</li> <li>Demonstrate the DELETE operation by removing salesman with id 1000. All his orders must also be deleted.</li> </ol>
3	<p>Consider the schema for Movie Database:</p> <p>ACTOR(<u>Act_id</u>, Act_Name, Act_Gender)</p> <p>DIRECTOR(<u>Dir_id</u>, Dir_Name, Dir_Phone)</p> <p>MOVIES(<u>Mov_id</u>, Mov_Title, Mov_Year, Mov_Lang, Dir_id)</p> <p>MOVIE_CAST(<u>Act_id</u>, <u>Mov_id</u>, Role)</p> <p>RATING(<u>Mov_id</u>, Rev_Stars)</p> <p>Write SQL queries to</p> <ol style="list-style-type: none"> <li>List the titles of all movies directed by 'Hitchcock'.</li> <li>Find the movie names where one or more actors acted in two or more movies.</li> <li>List all actors who acted in a movie before 2000 and also in a movie after 2015 (use JOIN operation).</li> <li>Find the title of movies and number of stars for each movie that has at least one rating and find the highest number of stars that movie received. Sort the result by movie title.</li> <li>Update rating of all movies directed by 'Steven Spielberg' to 5.</li> </ol>
4	<p>Consider the schema for College Database:</p> <p>STUDENT(<u>USN</u>, SName, Address, Phone, Gender)</p> <p>SEMSEC(<u>SSID</u>, Sem, Sec)</p> <p>CLASS(<u>USN</u>, <u>SSID</u>)</p> <p>SUBJECT(<u>Subcode</u>, Title, Sem, Credits)</p> <p>IAMARKS(<u>USN</u>, <u>Subcode</u>, <u>SSID</u>, Test1, Test2, Test3, FinalIA)</p> <p>Write SQL queries to</p> <ol style="list-style-type: none"> <li>List all the student details studying in fourth semester 'C' section.</li> <li>Compute the total number of male and female students in each semester and in each section.</li> <li>Create a view of Test1 marks of student USN '1BI15CS101' in all subjects.</li> <li>Calculate the FinalIA (average of best two test marks) and update the corresponding table for all students.</li> <li>Categorize students based on the following criterion:  If FinalIA = 17 to 20 then CAT = 'Outstanding'  If FinalIA = 12 to 16 then CAT = 'Average'  If FinalIA &lt; 12 then CAT = 'Weak'  Give these details only for 8<sup>th</sup> semester A, B, and C section students.</li> </ol>
5	<p>Consider the schema for Company Database:</p> <p>EMPLOYEE(<u>SSN</u>, Name, Address, Sex, Salary, SuperSSN, DNo)</p> <p>DEPARTMENT(<u>DNo</u>, DName, MgrSSN, MgrStartDate)</p> <p>DLOCATION(<u>DNo</u>, <u>DLoc</u>)</p> <p>PROJECT(<u>PNo</u>, PName, PLocation, DNo)</p> <p>WORKS_ON(<u>SSN</u>, <u>PNo</u>, Hours)</p> <p>Write SQL queries to</p> <ol style="list-style-type: none"> <li>Make a list of all project numbers for projects that involve an employee whose last name is 'Scott', either as a worker or as a manager of the department that controls the project.</li> </ol>

2. Show the resulting salaries if every employee working on the 'IoT' project is given a 10 percent raise.
3. Find the sum of the salaries of all employees of the 'Accounts' department, as well as the maximum salary, the minimum salary, and the average salary in this department
4. Retrieve the name of each employee who works on all the projects controlled by department number 5 (use NOT EXISTS operator).
5. For each department that has more than five employees, retrieve the department number and the number of its employees who are making more than Rs. 6,00,000.

**Part B: Mini project**

- For any problem selected, write the ER Diagram, apply ER-mapping rules, normalize the relations, and follow the application development process.
- Make sure that the application should have five or more tables, at least one trigger and one stored procedure, using suitable frontend tool.
- Indicative areas include; health care, education, industry, transport, supply chain, etc.

**Course outcomes:** The students should be able to:

- Create, Update and query on the database.
- Demonstrate the working of different concepts of DBMS
- Implement, analyze and evaluate the project developed for an application.

**Conduction of Practical Examination:**

1. All laboratory experiments from part A are to be included for practical examination.
2. Mini project has to be evaluated for 30 Marks.
3. Report should be prepared in a standard format prescribed for project work.
4. Students are allowed to pick one experiment from the lot.
5. Strictly follow the instructions as printed on the cover page of answer script.
6. Marks distribution:
  - a) Part A: Procedure + Conduction + Viva:  $10 + 35 + 5 = 50$  Marks
  - b) Part B: Demonstration + Report + Viva voce =  $15 + 10 + 05 = 30$  Marks
7. Change of experiment is allowed only once and marks allotted to the procedure part to be made zero.

  
H. O. D.

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