DBMS Lab Project Guidelines

Project work **Total: 20 Marks**

Presentation:	**5 Marks**
Viva Voce:	**5 Marks**
Report :	**10 Marks**

1. **Group Formation:**

   Form groups of **1 to 3 students**. Collaboration is strongly encouraged for DBMS projects, as it often involves more complex design and implementation.

2. **Project Topic Selection:**

   Choose a project that leverages MySQL's capabilities. Some project ideas are attached at the end.

3. **Project Planning and Documentation:**
   a. **Requirements Analysis:** Clearly define the functionalities your database should support. What kind of data will it store? What queries will users perform?
   b. **Conceptual Design (ER Diagram):** Create an Entity-Relationship Diagram (ERD) to visually represent the entities (tables) and their relationships in your database. This is a *crucial* step in DBMS projects.
   c. **Logical Design (Schema):** Translate the ERD into a relational schema, defining the tables, columns, data types, and primary and foreign keys. Specify constraints (e.g., NOT NULL, UNIQUE, CHECK) to enforce data integrity.
   d. **Physical Design:** Consider storage optimization, indexing strategies, and other physical aspects of the database. (Less critical for basic projects, but good to think about). **Implementation (SQL):** Write SQL scripts to create the database, tables, and relationships. Populate the database with sample data. *This is where you will use MySQL extensively.*
   e. **Query Development:** Develop a set of SQL queries to retrieve, insert, update, and delete data from the database. Include complex queries involving joins, subqueries, and aggregate functions.

f. **Testing and Evaluation:** Test your database thoroughly. Verify data integrity, query performance, and the functionality of your application (if any). Document the testing process and the results.

g. **Table Entries (Essential):** This is *very* important for DBMS projects. Consider N-team size
   - N>=1 and N <=3.
   - Team members from same lab batch.
   - Student must be part in one team only.
   - Number of relations to be >=5*N.
   - Number of unique features to be >=3*N as compared to existing literature survey.
   - Total records to be >3000*N. Total records will be computed by addition of all records in a given system. For example, consider 3 tables A(3X6),B(90X30) and C(30X10). Thus, total records are 18+2700+300=3018.
   - Projects having data from real time scenario and given by client can draws more marks.

h. **New Attribute:** Student should add new attributes to the tables which are unique from the existing.

4. **Report Writing:** Your report should include:

a. **Introduction**: Project overview and objectives.

b. **Requirements Analysis:** Detailed description of the database requirements.

c. **ER Diagram:** Visual representation of the database structure.

d. **Relational Schema:** Definition of tables, columns, data types, and constraints.

e. **SQL Scripts:** The SQL code used to create and populate the database.

f. **Query Examples:** A variety of SQL queries demonstrating the database's functionality. *Include the results of these queries in tables in your report. This is a great way to fulfill the 30-entry requirement.*

g. **Testing and Evaluation:** Results of your tests and analysis.

h. **Conclusion:** Summary of your project and future work.

5. **Presentation:**
   i) Prepare a presentation that covers the different stages of your project, from requirements analysis to implementation and testing.
   ii) Showcase your ER diagram, schema, and key SQL queries.
   iii) Demonstrate the functionality of your database (if possible).

6. **Viva Voce:**
   i) Be prepared to explain your design choices, the rationale behind your schema, and the SQL queries you developed.
   ii) Demonstrate a good understanding of database concepts, normalization, and SQL.
   iii) Be ready to discuss any challenges you faced and how you overcame them.

Project Ideas

E-commerce & Retail:

1. **Online Auction System:** Manage bids, auctions, users, and items. Consider features like bidding history, automatic bidding, and auction end notifications.
2. **E-bookstore Database:** Handle books, authors, publishers, reviews, ratings, and sales. Implement features for searching by genre, author, or keyword.
3. **Grocery Store Inventory and Sales:** Track inventory, sales, suppliers, and customer loyalty programs. Implement features for generating reports on popular items and sales trends.
4. **Fashion E-commerce Platform:** Manage clothing items, sizes, colors, brands, and customer orders. Implement features for product recommendations and personalized shopping experiences.
5. **Restaurant Reservation System:** Manage restaurant tables, bookings, customers, and menus. Implement features for online reservations and waitlist management.

Education & Learning:

6. **Online Course Management System:** Manage courses, students, instructors, assignments, grades, and discussions. Implement features for tracking student progress and generating reports.

7. **University Management System:** Manage students, faculty, departments, courses, enrollments, and grades. Implement features for generating transcripts and managing student records.
8. **Library Management System (Extended):** (As mentioned before, but add new features) Consider integrating with digital libraries, managing fines, and handling interlibrary loans.
9. **Online Exam System:** Manage questions, quizzes, exams, students, and results. Implement features for automatic grading and generating reports.
10. **Educational Resource Sharing Platform:** Manage learning materials, users, ratings, and reviews. Implement features for searching and filtering resources.

Healthcare & Medical:

11. **Hospital Management System (Extended):** (As mentioned before, but add new features) Focus on patient records, appointments, billing, and integration with medical devices.
12. **Pharmacy Management System:** Manage medications, prescriptions, patients, doctors, and inventory. Implement features for tracking drug interactions and generating reports.
13. **Medical Research Database:** Store and analyze data from clinical trials or medical studies. Implement features for data visualization and statistical analysis.
14. **Veterinary Clinic Management:** Manage animal patients, owners, appointments, treatments, and medical records. Implement features for tracking vaccinations and generating reports.
15. **Blood Bank Management System:** Manage blood donations, donors, blood types, inventory, and distribution. Implement features for tracking blood availability and ensuring safety.

Human Resources & Management:

16. **Employee Management System:** Manage employee information, salaries, performance reviews, attendance, and payroll. Implement features for generating reports and managing employee benefits.

17. **Recruitment Management System:** Manage job postings, applications, candidates, interviews, and hiring decisions. Implement features for tracking applicant progress and generating reports.
18. **Project Management System:** Manage projects, tasks, team members, deadlines, and progress. Implement features for Gantt charts and project tracking.
19. **Training Management System:** Manage training programs, courses, participants, instructors, and certifications. Implement features for tracking training progress and generating reports.
20. **Performance Appraisal System:** Manage employee performance reviews, goals, feedback, and ratings. Implement features for generating performance reports and identifying areas for improvement.

Other Applications:

21. **Real Estate Management System:** Manage properties, listings, clients, agents, and transactions. Implement features for searching properties and generating reports.
22. **Travel Agency Management System:** Manage tours, bookings, flights, hotels, and customers. Implement features for online booking and itinerary planning.
23. **Event Management System:** Manage events, venues, attendees, tickets, and logistics. Implement features for online ticketing and event promotion.
24. **Music Streaming Service Database:** Manage artists, albums, songs, playlists, users, and listening history. Implement features for personalized recommendations and music discovery.
25. **Movie Database and Recommendation System:** Manage movies, actors, directors, genres, ratings, and reviews. Implement features for movie recommendations and user ratings.
26. **Social Media Platform (Simplified - Extended):** (As mentioned before, but add new features) Focus on user interactions, posts, comments, groups, and privacy settings.
27. **Inventory Management System (Extended):** (As mentioned before, but add new features) Consider integrating with suppliers, purchase orders, sales, and warehouse management.
28. **Help Desk Ticketing System:** Manage customer support tickets, agents, issues, resolutions, and service level agreements. Implement features for tracking ticket status and generating reports.

29. **City Services Management System:** Manage citizen requests, service requests (e.g., potholes, repairs), departments, and resolutions. Implement features for tracking request status and generating reports.
30. **Personal Finance Tracker:** Manage income, expenses, budgets, accounts, and financial goals. Implement features for generating reports and visualizing financial data.