Premier University
Department of CSE
Complex Engineering Problem, 30th June 2024
Semester: 4th, **Session:** Spring 2024
Course Title: Database Management System**, Course Code:** CSE 237
Course Outcome: CO3**, Total Marks: 10**

Suppose you are a database engineer, you have to design a database for an online shopping system. The system will need to manage information about products, customers, orders, and other aspects of the shopping experience. Consider the different stakeholders involved, such as customers, administrators, and vendors (if applicable), and their data needs.

You will navigate through the objectives, investigation, evaluation, design, and deliverables to propose an effective database solution.

Objectives:

The following are the objectives of the solution:

i. Analyze the requirements of different stakeholders and convert them into a comprehensive database design.

ii. Develop the ability to translate a real-world scenario into a practical and normalized database schema.

Investigation:

The system is supposed to have the following features

- **User Roles and Permissions:** Different access levels for administrators, vendors (optional), and customer accounts.
- **Product Management:** Add, edit, and manage product information (descriptions, images, pricing, stock levels).
- **Customer Relationship Management (CRM):** Store and manage customer data securely, including purchase history and preferences for personalized marketing campaigns. ● **Order Management:** Track orders from placement through fulfillment, including inventory management and shipping details.
- **Reporting and Analytics:** Generate reports on sales performance, customer trends, inventory levels, and identify areas for improvement.
- **Vendor Management (optional):** If applicable, provide vendors with a platform to manage their product listings, stock updates, and order fulfillment processes.

- **Customer Portal:** Account creation, secure payment processing, order tracking, and communication with customer support.
- **Administrative Dashboard:** Monitor overall store performance, manage users, products, orders, and generate reports.

Evaluation:

Discuss the reasons behind utilizing a relational database for this scenario.

How can a relational database efficiently manage complex relationships among various stakeholders of the system?

What are the benefits of using a structured database over file management systems or spreadsheets?

Design:

Propose a comprehensive database design for the School Result Management System.

Deliverables:

A printed assignment reporting the following tasks:

(i) A broad suggestion of the appropriate image processing technique meeting the provided requirements.

(ii) Relevant Mathematical explanations supporting the Suggestion.

(iii) Briefly address the complex problem-solving questions:

a. Does the solution need in-depth engineering knowledge?

b. Does the solution involve wide-ranging or conflicting technical, engineering, and other issues?

c. Is the solution well-known, or does it require abstract thinking and analysis to formulate?

d. Does the solution involve infrequently encountered issues?

e. Does the solution need adherence to standards and codes of practice?

f. Does the solution involve stakeholders with conflicting technical requirements?

g. Does the solution involve interdependence between sub-problems or parts?

Rubrics for Assignment marking:

Task	**Criteria**	**Good (4-5) Moderate (2-3)**	**Poor (1)**
i.	Problem solution	Properly designed diagrams including all functionalities Appropriate solution for some cases	Inappropriate or no solution

ii.	Problem analysis	In-depth analysis Shallow analysis	Incomplete analysis