**CSA0556 – Database Management Systems for Relational Database**

**Assignment 1 Questions**

Answer the following Questions Each carry 10 Marks

|  |  |  |  |
| --- | --- | --- | --- |
| **Sl. No** | **Question** | **CO** | **BTL** |
| **1** | **Project Scenario: Library Management System**  **Scenario Description**  You have been tasked with designing a Library Management System for a public library. The system should manage the borrowing and returning of books by members, track the availability of books, and keep records of all transactions. The goal is to create a logical model diagram that captures the essential entities and relationships within the system.  **Requirements**   1. **Books**:    * Each book has a unique identifier (Book ID), title, author, publisher, and publication year.    * Books can have multiple copies, each with a unique Copy ID. 2. **Members**:    * Each member has a unique Member ID, name, address, phone number, and email.    * Members can borrow multiple books, but there is a limit to the number of books a member can borrow at one time. 3. **Borrowing Transactions**:    * Each borrowing transaction has a unique Transaction ID, Member ID, Copy ID, borrow date, and due date.    * A member can borrow multiple books in a single transaction, and each book borrowed will have a separate entry. 4. **Returning Transactions**:    * Each returning transaction has a unique Transaction ID, Member ID, Copy ID, and return date.    * Books returned late incur a fine based on the number of late days. 5. **Fines**:    * Fines have a unique Fine ID, Transaction ID, amount, and payment status.    * The fine amount is calculated based on the number of late days and a fixed daily fine rate.   **Entities and Attributes**   1. **Book**    * Book ID (Primary Key)    * Title    * Author    * Publisher    * Publication Year 2. **Copy**    * Copy ID (Primary Key)    * Book ID (Foreign Key) 3. **Member**    * Member ID (Primary Key)    * Name    * Address    * Phone Number    * Email 4. **BorrowingTransaction**    * Transaction ID (Primary Key)    * Member ID (Foreign Key)    * Copy ID (Foreign Key)    * Borrow Date    * Due Date 5. **ReturningTransaction**    * Transaction ID (Primary Key)    * Member ID (Foreign Key)    * Copy ID (Foreign Key)    * Return Date 6. **Fine**    * Fine ID (Primary Key)    * Transaction ID (Foreign Key)    * Amount    * Payment Status   **Relationships**   1. **A Book can have multiple Copies**. 2. **A Member can have multiple BorrowingTransactions**. 3. **A BorrowingTransaction involves one Member and one Copy**. 4. **A ReturningTransaction involves one Member and one Copy**. 5. **A Fine is associated with one BorrowingTransaction**.   **Logical Model Diagram**  You can now create the logical model diagram based on the entities and relationships described above. Use an Entity-Relationship (ER) diagram to visually represent the model. The diagram should include:   * Entities (represented as rectangles) * Attributes (represented as ovals) * Primary keys (underlined attributes) * Relationships (represented as diamonds or lines connecting entities) * Foreign keys (represented as lines connecting related entities) | CO1 | BL6 |
| **2** | **Project Scenario: Oracle Baseball League (OBL)**  You are a small consulting company specializing in database development. You have just been awarded the contract to develop a data model for a database application system for a small retail store called Oracle Baseball League (OBL).  The Oracle Baseball League store serves the entire surrounding community selling baseball kit. The OBL has two types of customer, there are individuals who purchase items like balls, cleats, gloves, shirts, screen printed t-shirts, and shorts. Additionally customers can represent a team when they purchase uniforms and equipment on behalf of the team.  Teams and individual customers are free to purchase any item from the inventory list, but teams get a discount on the list price depending on the number of players. When a customer places an order we record the order items for that order in our database.  OBL has a team of three sales representatives that officially only call on teams but have been known to handle individual customer complaints. | CO1 | BL6 |