**Practical Exam: SWD392 -SU25**

**Duration:** 85 Minutes

Name: Hoang Trong Quang

ID: DE180830

**Questions 1. (3.0 points)**

A diagram of a book

AI-generated content may be incorrect.

**Questions 2. (3.0 points)**

**Sequence Diagram**

**A diagram of a program

AI-generated content may be incorrect.**

**Questions 3. (3.0 points)**

**State diagram**

**A diagram of a computer

AI-generated content may be incorrect.**

[https://app.diagrams.net/#G10M5g9FxeT8QIUNC1lRwUHI-vwJcQPFO0#%7B%22pageId%22%3A%221V8Ed6SCzGhBcCSxNeir%22%7D](https://app.diagrams.net/#%7B%22pageId%22%3A%221V8Ed6SCzGhBcCSxNeir%22%7D)  
link drawIO

**Question 4 (1 điểm)** Architecture Name: Three-Tier Architecture Explanation: The Three-Tier Architecture divides the application into three main layers: Presentation Layer: Handles the user interface and user-side operations. Business Logic Layer: Contains the core logic, rules, and processes of the system (e.g., borrowing, returning books, searching for books, etc.). Data Access Layer: Manages data storage, retrieval, and connection to the database. This architecture is suitable for a Library Management system because it helps separate functions, making the system easy to manage, easy to test, and easy to extend later. It also supports many different types of client interfaces (such as web or desktop), and allows each layer to be upgraded or replaced independently. Main advantages: Easier to maintain and extend: Each layer can be developed, tested, and maintained separately. Business logic or database can be easily updated without affecting the user interface. Main disadvantages: Increased complexity: The initial design and construction will be more complex than a simple system, requiring careful design and additional code to allow the layers to communicate with each other.

**Question 5 (1 điểm)**

Design Pattern Name: Strategy Pattern Explanation: The Strategy Pattern defines a family of algorithms, encapsulating each algorithm in a separate class and allowing the algorithm to be swapped and selected while the program is running. In a Library Management system, searching by Title, Author or ISBN are different strategies. The main search interface simply selects the appropriate strategy without knowing the details of how each search algorithm works. Why this is the best solution: The Strategy Pattern makes the system flexible and extensible. If new search types are needed later (e.g. by genre, by year of publication...), just create a new strategy without modifying the main interface. This pattern also follows the Open/Closed Principle: The system allows for extension (adding new algorithms) without modifying the old source code.