Assignment: Object-Oriented Programming in Java

Part 1: Theory Questions

1. **Define and explain the following terms:**
    - Object
    - Class
    - Encapsulation
    - Inheritance
2. **Discuss the benefits of encapsulation in Java. Provide examples to illustrate your points.**
3. **Explain the concept of inheritance in Java. How does it promote code reuse? Provide an example with a superclass and a subclass.**

Part 2: Practical Application

Problem 1: Class Design

Consider the scenario of managing a library. Design and implement the following classes:

- `Book` class with the following attributes:
    - Title
    - Author
    - Year of publication
- `Library` class that encapsulates a collection of `Book` objects.

Problem 2: Constructors

1. Implement a parameterized constructor in the `Book` class to initialize its attributes.
2. Implement a default constructor in the `Library` class to initialize an empty collection of books.
3. Overload the constructors in the `Book` class to provide flexibility for creating objects.

Problem 3: Inheritance

Extend the `Book` class to include a `Magazine` subclass. The `Magazine` class should have an additional attribute for the publication frequency (e.g., monthly, weekly).

Problem 4: Encapsulation

Make appropriate fields in the `Book` and `Magazine` classes private. Provide public methods to access and modify these fields.

Part 3: Submission

Submit your assignment as a zip file containing:

- A document with the theoretical answers (Part 1).
- Java source code files for the implemented classes and constructors (Part 2).
- A brief explanation of the design choices made in the implementation.