CHRIST (Deemed to be University)

Department of Computer Science

Master of Artificial Intelligence and Machine Learning

CIA-Component 2 -Practical Test

Course: MAI271 – JAVA Programming
Date: 19 – 12 – 2023
Duration: 1 Hour
Section: PART B
Marks: 20

PART B:

You have been assigned the task of designing a Library Management System for CHRIST (Deemed to be University) in Java. The system is intended to efficiently manage various aspects of library operations, utilizing object-oriented programming principles for flexibility and scalability.

Base Class: Book **(R1:5 Marks)**

Develop a class named Book with essential attributes:

- bookId (integer): unique identification number for each book
- title (String): the title of the book
- author (String): the author of the book
- Implement appropriate methods for setting and retrieving these attributes, ensuring adherence to professional coding standards.

Derived Classes: **(R2:5 Marks)**

Create specialized classes, ReferenceBook and FictionBook, both extending the Book class.

For ReferenceBook, introduce an additional attribute:

- edition (int): the edition number of the reference book

For FictionBook, include an extra attribute:

-genre (String): the genre of the fiction book

Implement methods in each derived class to display detailed book information.

Functionality: **(R3:5 Marks)**

Design methods for borrowing and returning books in the Library Management System.

- Implement a mechanism to track the availability of each book, and update it accordingly when borrowed or returned.

Inheritance Hierarchy:

Extend the hierarchy with a new class, Periodical, derived from ReferenceBook.

- Introduce an extra attribute:

    - issueFrequency (String): the frequency at which the periodical is issued (e.g., weekly, monthly).
- Implement methods to display detailed information for periodicals.

Data Validation: **(R4:5 Marks)**

Implement robust data validation mechanisms to ensure that book IDs, edition numbers, and other relevant attributes conform to predefined ranges.

Additional Features:

Extend the classes with methods to compute and display overdue fines for late returns.Integrate functionality for tracking and displaying the total number of books available and borrowed, maintaining a professional and comprehensive overview of the library's collection and usage.

General Instruction:

1. Include descriptive comments within the code, explaining its functionality and logic.
2. Attach a PDF document named "your_register_number_exercise_No.pdf" to the submission.The PDF document should include screenshots of the code and the output screen.