

CDAC Mumbai
PG-DAC Aug24 Batch (Juhu& Kharghar)
Lab Exam

Module 4: Object Oriented Programming in Java

Time : 2hrs

Marks: 40

Ayurveda Products Website

Question:

Design and develop a Ayurveda Products Website where users can browse, add products to their cart, and place orders. The system should incorporate Java concepts like Constructor Chaining, Exception Handling, OOP principles, Inheritance, Polymorphism, and Collections.

Requirements:

1. Class Design and Inheritance:

- Create a base class `Product` with properties like `productId`, `name`, `price`, and `stock`.
- Extend this into subclasses `HerbalProduct` and `OrganicProduct`, each with specialized attributes.
- Create a `Customer` class with properties like `customerId`, `name`, `cart` (a collection of products), and methods to `addToCart()` and `checkout()`.

2. Constructor Chaining:

- Use constructor chaining in the `Product` class and its subclasses to initialize common product properties.

3. Polymorphism:

- Implement polymorphism by overriding the `applyDiscount()` method for different product types (`HerbalProduct` and `OrganicProduct`).

4. Collections and Functionalities:

- Use a `List<Product>` to manage available products.
- Use a `Map<Customer, List<Product>>` to store customers' carts.

5. Exception Handling:

- Implement custom exceptions:
 - `OutOfStockException`: Thrown when a customer tries to add an out-of-stock product to their cart.
 - `InvalidProductException`: Thrown when an invalid product is accessed.

6. Bonus (optional):

- Add a `Queue` to manage customer orders and process them in sequence.
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