

CDAC Mumbai
PG-DAC Aug25 Batch (Kharghar)
OOPJ Lab Exam
Module 4: Object Oriented Programming in Java

Time : 2hrs

Marks: 40

Question 1 : Hotel Booking System [20 marks]

You are tasked with developing a Hotel Booking System in Java. The system should allow users to search for available rooms, make reservations, and manage customer details. Your design should demonstrate concepts like Constructor Chaining, Exception Handling, Object-Oriented Programming (OOP), Inheritance, Polymorphism, and the use of Collections.

Requirements:

1. Class Design and Inheritance:

- Create a base class `Room` with properties like `roomId`, `roomType` (Single, Double, Suite), `price`, and `isAvailable`.
- Extend this class into `LuxuryRoom` and `EconomyRoom`, where each type has specific attributes such as additional amenities.
- Create a `Customer` class with properties like `customerId`, `name`, `email`, and `bookRoom()`/`cancelBooking()` methods.

2. Constructor Chaining:

- Use constructor chaining in the `Room` class and its subclasses to initialize room properties.

3. Polymorphism:

- Implement polymorphism by overriding the `bookRoom()` method to handle different room types (e.g., `LuxuryRoom` or `EconomyRoom`).

4. Collections and Functionalities:

- Use a `List<Room>` collection to manage room availability.
- Use a `Map<Customer, Room>` collection to track which rooms are booked by which customers.

5. Exception Handling:

- Implement custom exceptions like:
 - `RoomNotAvailableException`: Thrown when a customer tries to book a room that is unavailable.
 - `InvalidBookingException`: Thrown when an invalid booking operation is attempted.

6. Bonus (optional):

- Add features for room cleaning scheduling, managed using `Queue`.

Question 2 : Online Shopping [10 marks]

Scenario: An e-commerce platform processes orders by calculating the total price (quantity × unit price). The system needs to handle invalid quantities and accessing non-existent products.

Task: Create an order processing method that handles multiple exception types.

Sample Input:

0
3
299.99 499.99 199.99
5

Expected Output:

Arithmetic Exception caught
or
Array Index Exception

Question 3: Employee Management System [10 marks]

Use Case: Manage employee information including name and salary.

Requirements:

- Create Employee objects with name and salary (dynamically).
- Store employees in a collection.
- Display employee information.

Sample Input (Dynamic):

- Employee 1: Name = Amit, Salary = 50000
- Employee 2: Name = Priya, Salary = 60000
- Employee 3: Name = Rahul, Salary = 55000
- Employee 4: Name = Neha, Salary = 45000
- Employee 5: Name = Vikram, Salary = 70000
- Employee 6: Name = Sanya, Salary = 65000
- Employee 7: Name = Karan, Salary = 48000

Expected Output:

Employee List:
Amit:50000
Priya:60000
Rahul:55000
Neha:45000
Vikram:70000
Sanya:65000
Karan:48000