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Daffodil International University

Faculty of Science & Information Technology

Department of Computer Science & Engineering

Midterm Examination, Fall 2025

Course Code: CSE221, Course Title: Object Oriented Programming

Level: 2 Term: 2

Time: 01:30 Hrs **Marks: 25**

Answer ALL Questions

[The figures in the right margin indicate the full marks and corresponding course outcomes. All portions of each question must be answered sequentially.]

1.		Explain the concepts of classes and objects in Java (or OOP) with suitable real-life examples, illustrating how they represent real-world entities and their characteristics.	03	CO1

2.		**Predict the output of the following program below.**
		`class A {`
		`  A() {`
		`  System.out.println("A's Constructor");`
		`  }`
		`  void show() {`
		`  System.out.println("Show from A");`
		`  }`
		`}`
		`class B extends A {`
		`  B() {`
		`  System.out.println("B's Constructor");`
		`  }`
		`  void show() {`
		`  System.out.println("Show from B");`
		`  }`
		`}`
		`public class Test {`
		`  public static void main(String[] args) {`
		`  A obj = new B();`
		`  obj.show();`
		`  }`
		`}`
			02	CO2

3.	*a)*	A financial organization is developing a **Banking Transaction System** using Object-Oriented Programming concepts to efficiently manage customer accounts. Each **Account** includes attributes such as accountNo, holderName, and balance, along with methods to deposit and withdraw money. To handle specialized account operations, the organization introduces a single subclass, **SavingsAccount**, which extends **Account** by adding an additional attribute interestRate and a method calculateInterest() that computes and adds interest to the account balance. Now draw a **UML**	05	

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		Class Diagram to represent the attributes, methods, and single inheritance relationship between the **Account** and **SavingsAccount** classes		**CO3**
	b)	In a **Ride Fare Estimation System**, the company needs to calculate ride fares under different conditions such as **fixed fare** and **discounted fare** for special customers.**Analyze** the scenario and **identify** a suitable Object-Oriented Programming concept that can make the fare calculation more flexible and reusable.Then, **write a short Java code snippet** to demonstrate your identified concept.	**03**	
4.		A software company is developing a **Smart Transportation Management System** using Object-Oriented Programming concepts to efficiently manage information about different types of vehicles such as **Car** and **ElectricCar**. Each **Vehicle** possesses attributes like vehicleNo, brand, and mileage. The **Car** class inherits from **Vehicle** and introduces an additional attribute fuelType along with a method displayDetails() that presents the car's information. Furthermore, the **ElectricCar** class extends the **Car** class by adding a new attribute batteryCapacity and **overrides** the displayDetails() method to incorporate battery-related details		
	a)	• Demonstrate the **inheritance** in the above scenario. • Use **method overriding** to redefine the displayDetails() method. • In your main() method, create an object of ElectricCar and display its details.	**10**	**CO2**
	b)	Explain conceptually how inheritance in this scenario allows method access and reuse.	**02**	