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Daffodil International University

Faculty of Science & Information Technology
Department of Computer Science & Engineering
Midterm Examination, Summer 2026
Course Code: CSE221, Course Title: Object Oriented Programming
Level: 2 Term: 1 Batch: 68

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.	*a)*	Differentiate between a **class** and an **object** with suitable example.	~~2.5~~	CO1
	b)	Summarize **four pillars of Object-Oriented Programming** (Encapsulation, Inheritance, Polymorphism, and Abstraction) with real-world examples for each.	~~2.5~~	
2.		A hospital wants to store information about its employees. Every employee has an **employeeId** and a **name**. A Doctor additionally has a **specialization** and **designation**. The hospital also has a payment system for bills. Patients can pay using: CreditCard → "Processing Credit Card Payment" MobileBanking → "Processing Mobile Banking Payment" Cash → "Processing Cash Payment" The hospital maintains a **BankAccount** to manage funds.		CO2
	a)	Implement **payBill()** and **refund()** methods in relation to patients and the hospital's BankAccount. Create object(s) with java program to pay bill 5000, refund 2000, and print the final balance.	3	
	b)	Write a Java program using the hospital scenario above. Create a **superclass Employee** and two **subclasses** Doctor and DoctorAssistant where both inherit from Employee. DoctorAssistant additionally has a department attribute. Apply encapsulation for all attributes, use constructor to initialize them, and **override displayInfo()** method in both subclasses to demonstrate polymorphism. Create objects of both subclasses and display their information.	~~7~~	
3.		A Library Management System maintains records of books and members. A Book is a type of Item. Each Item has an itemId and title. Each Book additionally has an author. A Member has a memberId and name and can borrow multiple books. A Library has a libraryName, maintains a list of books, and has addBook() and issueBook() methods.		CO3
	a)	Suppose that you are working as a UML Class Diagram analyst, illustrate all **classes, attributes, methods** for the required system.	~~10~~	