



Daffodil International University
Department of Computer Science and Engineering
Faculty of Science & Information Technology
Midterm Examination, Summer 2025

Course Code: CSE221, Course Title: Object Oriented Programming

Level:2 Term:2 Batch: ALL

Time: 1.5 Hours

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.	<p>A Food-Delivery Platform connects Customers with Restaurants.</p> <ul style="list-style-type: none">• A Customer has <code>custid</code>, name and email• Each Customer places many Orders.• An Order has an <code>orderId</code>, <code>orderDate</code>, and <code>totalAmount</code>.• Each Order contains one or more MenuItems (name, price). <p>A class-level attribute is required in Order to keep the running total of orders placed on the platform.</p> <p>a) Business-Case Analysis</p> <p>a) List three attributes (with Java data types) for Customer and Order.</p> <p>b) Identify two behaviours (methods) relevant to classes in the case.</p> <p>c) Describe the relationships among Customer, Order and MenuItem, including <i>multiplicity</i>.</p> <p>b) UML Class Diagram</p> <p>Draw a UML diagram comprising Customer, Order and MenuItem showing:</p> <ul style="list-style-type: none">• attributes with visibility and data types• methods you identified in part a)• association links with multiplicities• the static attribute that tracks total orders <p>c) Java Implementation</p> <p>Implement the UML model:</p>	5	CO1
		6	CO3
		6	CO4

	<ol style="list-style-type: none"> 1. Create the three classes with constructors and the members from UML model. 2. Declare and update the static attribute in Order. 3. In a <code>main()</code> method, instantiate one Customer who places two Orders, each containing at least one MenuItem. 4. Print a summary showing customer name, order IDs, item names and total orders so far. <p>d) Reasoning on Design Choices</p> <p>Why is the <i>totalOrders</i> counter best declared static? Write 3 points which may further enhance your model.</p>	3	CO2
2.	<p>Problem Solving</p> <p>Scenario: A Car-Pooling Service matches Drivers (driverID, rating) with Rides (rideID, distance, fare) requested by Riders (riderID, name). A Rider can join many Rides; a Ride can include many Riders; a Driver drives many Rides but each Ride has one Driver.</p> <p>Tasks</p> <ol style="list-style-type: none"> 1. Identify the classes and principal attributes (no methods needed). 2. Sketch a high-level UML class diagram with correct multiplicities (show <i>Driver–Ride</i> and <i>Rider–Ride</i> separately). 	5	CO3

Good Luck