



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.	A <u>Food-Delivery Platform</u> connects Customers with Restaurants. • A <u>Customer</u> has <u>custid</u>, <u>name</u> and <u>email</u> • Each Customer places many <u>Orders</u>. • An Order has an <u>orderId</u>, <u>orderDate</u>, and <u>totalAmount</u>. • Each Order contains one or more <u>MenuItems</u> (name, price). A class-level attribute is required in <u>Order</u> to keep the <u>running total</u> of orders placed on the platform. a) <u>Business-Case Analysis</u> a) List three <u>attributes</u> (with Java data types) for <u>Customer</u> and <u>Order</u> b) Identify two behaviours (methods) relevant to classes in the case. c) Describe the <u>relationships</u> among <u>Customer</u>, <u>Order</u> and <u>MenuItem</u>, including <u>multiplicity</u>. b) <u>UML Class Diagram</u> Draw a UML diagram comprising <u>Customer</u>, <u>Order</u> and <u>MenuItem</u> showing: • <u>attributes with visibility and data types</u> • <u>methods you identified in part a)</u> • <u>association links with multiplicities</u> • <u>the static attribute that tracks total orders</u> c) <u>Java Implementation</u> Implement the UML model: (code)	5	CO1
		6	CO3
		9	CO4

	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. d) Reasoning on Design Choices Why is the <i>totalOrders</i> counter best declared static? Write 3 points which may further enhance your model.	3	CO2
2.	Problem Solving 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 <u>each Ride has one Driver</u>. Tasks 1. Identify the <u>classes</u> and <u>principal attributes</u> (no methods needed). 2. Sketch a high-level UML class diagram with correct multiplicities (show <u>Driver-Ride</u> and <u>Rider-Ride</u> separately).	5	CO3

Good Luck