



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



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

Good Luck