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Daffodil International University

Faculty of Science & Information Technology

Department of Software Engineering

Final Examination, Spring 2026

Course Code: SE 223; Course Title: Database System

Sections & Teachers: NJ (A), SS (B), TRT (C, D, K), KRA (E, F), CP (G, H), AUA (I), AR (J)

Time: 2:00 Hrs **Marks: 40**

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) *Customer*

Customer_ID	Customer_Name	City	Country
C001	*Ahmed Khan*	*Dhaka*	Bangladesh
C002	*Sarah Johnson*	*London*	UK
C003	*Maria Garcia*	*Madrid*	Spain
C004	*Chen Wei*	*Beijing*	China
C005	*Priya Sharma*	*Mumbai*	India

Orders

Order_ID	Customer_ID	Order_Date	Amount	Status
O101	*C001*	*2024-03-15*	*2500.00*	*Completed*
O102	*C003*	*2024-03-18*	*1800.50*	*Pending*
O103	*C001*	*2024-04-02*	*3200.75*	*Completed*
O104	*C005*	*2024-04-12*	*950.00*	*Cancelled*
O105	*C002*	*2024-04-12*	*5600.00*	*Completed*

Solve SQL queries for the given question:

a. Retrieve the total order amount for each customer.
b. Find all customers who have placed more than 2 orders.
c. Find all customers who have placed orders.
d. Count the number of orders by status category.
e. Get the details of customers who are from "Dhaka" city.
f. Find all orders that do not have a "Completed" status.
g. Get the customer information whose name contains "a" (case insensitive).
h. Find the order IDs of those orders that were placed between 15th March 2024 and 12th April 2024.
i. List all orders with customer details (show Order_ID, Order_Date, Amount, Customer_Name, and City).
j. Find the customer name whose total ordered amount is greater than any amount ordered in 2024-04-12.

[Marks-10] **CLO-3** *Level-3*

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2. Consider the following tables:

Topic: University Library System

Borrow_ID	Borrow_Date	Student_ID	Student_Name	Dept	Book_ID	Book_Title	Author	Price	Category
B01	3/10/2024	S101	Karim	CSE	L01, L02	DBMS, OS	Smith, Ali	45, 50	Tech, Tech
B02	3/12/2024	S102	Rahim	EEE	L03	Networks	Khan	60	Tech
B03	3/15/2024	S101	Karim	CSE	L04, L05	AI, ML	Lee, Wang	70, 80	Tech, Tech
B04	3/18/2024	S103	Sara	BBA	L06	Marketing	Roy	40	Biz

	a)	**Analyze** the given table and normalize it from 1NF to 3NF, examining every step for the tables given in question 2, with a proper explanation.	[Marks-8]	CLO-4 *Level-4*
	b)	**Distinguish** between transitive dependency and multivalued dependency.	[Marks-2]	
	c)	**Outline** the normalization rules and explain why we need normalization to design efficient databases based on question 2.	[Marks-4]	
	d)	**Identify** anomalies that may exist in the unnormalized table and explain with proper justification based on question 2.	[Marks-4]	
	e)	**Project** Project_ID | Project_Name | Employee_ID | Employee_Name | Role | Hours_Worked P01 | Website Dev | E01 | Ahmed | Developer | 40 **Explain** the current normalization level of the given table.	[Marks-2]	
3.	*a)*	**Illustrate** an Entity-Relationship (ER) Diagram for the normalized university library system from Question 2. with appropriate attribute types, cardinality constraints, and relationships between entities.	[Marks-5]	CLO-2 *Level-4*
4.	*a)*	**Explain** the transaction properties, and also elaborate on the three states of transaction execution (Active, Partially Committed, Aborted) based on the question Table 2 (Library System).	[Marks-3]	CLO-5 *Level-2*
	b)	**Describe** each component of ACID properties and explain how they ensure reliability, integrity, and concurrency control in database transactions based on the question Table 2 (Library System).	[Marks-2]	