



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:

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

[Marks-10]

CLO-3
Level-3

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 [Marks-2]
- | 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.
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]