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Daffodil International University

Department of Software Engineering

Faculty of Science & Information Technology

Final Examination, Spring 2025

Course Code: SE223; Course Title: Database System

Sections & Teachers: NJ(A), TRT(B), KRA(C, D), MMSI(F), AR(G,H,N), SAN(J,K), LA(I,L), KMH(E, M)

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.	Consider the following Schema and **Solve** with SQL for the following questions: Project (P_ID, Project_Name, Manager, Budget) Employee (E_ID, Employee_Name, Address, Department_No) Department (Departnemt_No, Department_Name, Location) Emp_Timehour (P_ID, E_ID, Hour_Rate) a. Retrieve project names and the names of employees working on them. b. Show the project name, employee name, and hour rate for projects managed by 'Alice'. c. List all employees working on projects with budgets over 5,000,000. d. Find the total budget of projects managed by each manager. e. Find projects where the total payment to employees (hour rate sum) exceeds 10,000.	[Marks-10]	CLO-3 *Level-3*
2.	Imagine you want to withdraw money from an ATM. You provide all the required details, and the system asks for the withdrawal amount. You input the amount and confirm the process. However, during this process, an error occurs, and the transaction does not complete. Consider the above situation. **Explain** the states of the transaction by drawing a state diagram. Also, explain how the system maintains consistency in this case.	[Marks-5]	CLO-5 *Level-2*
3	a. **Apply** the concepts of insert, update, and delete anomalies to justify the need for normalization with relevant examples.	[Marks-6]	CLO-4 Level-4

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Consider the given schema and answer the following questions:

CustNo	Cust Name	Address	Phone	AccNo	Branch	Branch ID	Balance	Branch city	Branch Manager	CustType
C-11	Ali	Mouchak	7114345	A-21	Dhanmondi	B-41	50000	Dhaka	Ahad	Depositor
C-11	Ali	Mouchak	7114345	A-31	Dhanmondi	B-42	5000	Dhaka	Forhad	Borrower
C-12	Mou	Gulshan	7114446	A-22	Syamoli	B-49	500000	Dhaka	Bashir	Depositor
C-13	Robi	LamaBazar	7124345	A-23	LamaBazar	B-57	30000	Chittagong	Moyez	Depositor
C-14	Saif	LamaBazar	7114845	A-24	LamaBazar	B-57	28000	Chittagong	Moyez	Depositor
C-15	Suny	Kamarpara	7114645	A-32	Kamarpara	B-72	2000	Sylhet	Feroz	Borrower

	b. **List** the normalization rules sequentially	[Marks-3]	CLO-4 Level-4
	c. **Normalize** the table from 1NF up to 3NF, examining every step of the process with a proper explanation.	[Marks-11]	
4.	**Outline** ERD from the result of Normalization that you solved in Q. 3. c.	[Marks-5]	CLO-2 *Level-4*

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