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Daffodil International University
Department of ITM
Faculty of Science & Information Technology
Final Examination, Spring 2025

Course Code: ITM 221; Course Title: Database Management Systems

Sections & Teachers: NJ

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.]

a) [Marks-10] CLO-3 Level-3

Employee

Employee_id	Employee_name	Department_ID	Department
101	Steven	200	HR
202	John Doe	201	Finance
301	Lex	114	Marketing
402	Alexander	203	Accounting
501	Bruce	121	IT

Salary

EMPLOYEE_ID	Salary	PHONE_NUMBER	HIRE_DATE	Department_ID
101	20000	5151234567	2003-06-17	200
202	3598	5241234567	2005-09-21	201
301	3000	5151258567	2001-01-13	114
404	79000	5151248567	2006-01-03	203
505	348799	515489567	2005-06-25	121
102	12390	578489567	2006-02-05	123

Develop SQL queries for the given question:

a. Retrieve the average salary for each department.
b. Count the number of employees in each department.
c. Get the details of employees who work in the "Marketing Department".
d. Get the employee information whose name starts with "A".
e. Find the phone numbers of those employees who were hired between 17th June 2003 and 3rd January 2006.

2. Consider the following tables: CLO- Level-

Topic: DIU library Management

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DIU library management data where student's information is recorded, when a student borrowed a book, when he returned etc.

StudentID: 024222000518888888
StudentName: Sumaiya
StudentEmail: sumu23@gmail.com
StudentPhoneNo:01789955454
BorrowID: 04

DepartmentName: ITM
DepartmentNo: 51
BorrowedDate: 20-04-24
ReturnDate: 04-05-24

BookID	BookName	AuthorName	Publisher
04	To Kill a Mockingbird	Harper Lee	HarperCollins
05	1984	George Orwell	Penguin Books
06	The Great Gatsby	F. Scott Fitzgerald	Scribner

a) **Normalize** the table from 1NF up to BCNF; examining every step of the process from those tables given in question 2 with proper explanation. **[Marks-8]**

b) **Distinguish** between full functional dependency and partial dependency from the above tables. **[Marks-2]**

c) **Analyze** two anomalies that may exist in the above tables. **[Marks-4]**

d)

Student_Id	Student_name	Student_Address	Course_no	Course_title

Explain the current normalization level of the given table. **[Marks-2]**

a) **Establish** an Entity relationship diagram based on the tables given in question 2 with appropriate attribute type, cardinality, and relationship. **[Marks-5]** CLO-2 *Level-3*

b) **Consider the following 2 tables find the output of Inner join and Left outer join** **[Marks-4]**

flightNo	from	to	distance	departs	aircraftId
101	New York	Los Angeles	4500	10:00 AM	A1
102	Chicago	Miami	2000	2:00 PM	A2
103	Dallas	Seattle	3000	6:00 PM	A2
104	Boston	Houston	2600	8:30 AM	A6

aircraftId	airName	range
A1	Boeing 737	5000
A2	Airbus A320	4500
A3	Embraer E175	3500
A4	Bombardier CRJ	4000

a) Alice initiates a transfer of ₹5,000 to Bob. The system debits Alice's account, but due to a network failure, the credit to Bob's account fails.
Based on this case, which ACID properties are affected, explain? **Explain the states of the transaction for that transaction** **[Marks-5]** CLO-5 *Level-2*