



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.]

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

  

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:**

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

[Marks-10] CLO-3 Level-3

2. Consider the following tables:  
 Topic: DIU library Management

CLO- Level-

DIU library management data where student's name, ID, department, 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) **Analyze** the current normalization level of the given table. [Marks-2]
- | Student Id | Student_name | Student_Address | Course_no | Course_title |
|------------|--------------|-----------------|-----------|--------------|
|            |              |                 |           |              |
- 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