



Daffodil International University
Department of Software Engineering
Faculty of Science & Information Technology
Final Examination, Spring 2024
Course Code: SE 223; Course Title: Database Systems
Sections & Teachers: NJ, KRA, AM

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) **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. Find all employees who earn more than John Doe.
- c. Find those employees who earn more than the average salary.
- d. Count the number of employees in each department.
- e. Get the details of employees who work in the "Marketing Department".
- f. Find all employees who do not have a salary entry.
- g. Get the employee information whose name starts with "A".
- h. Find the phone numbers of those employees who were hired between 17th June 2003 and 3rd January 2006.
- i. Find all employees whose salary is higher than the average salary of their department.
- j. Find the employee id who gets the highest salary.

[Marks-10]

CLO-3
Level-3

2.

Consider the following tables:

Topic: DIU library Management

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: SWE
 DepartmentNo: 35
 BorrowedDate: 20-04-24
 ReturnDate: 04-05-24

BookID	BookName	AuthorName	Publisher
04	To Kill a Mockingbird	Harper Lee	HarperCollins
05	1984	Georg 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-6]

b) **Distinguish** between full functional dependency and partial dependency from the above tables. [Marks-4]

c) **List** the normalization rules and explain why we need normalization to design databases. [Marks-4]

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

e) [Marks-2]

Student_Id	Student_name	Student_Address	Course_no	Course_title

Explain the current normalization level of the given table.

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

4. a) **Demonstrate** the transaction properties along with an explanation of any two properties, and **explain the** states of the transaction. [Marks-3]

b) **Define** each component of ACID properties, and how they ensure reliability, integrity, and concurrency control in database transactions. [Marks-2]

CLO-4
Level-4

CLO-2
Level-3

CLO-5
Level-2