



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:

- Retrieve the average salary for each department.
- Find all employees who earn more than John Doe.
- Find those employees who earn more than the average salary.
- Count the number of employees in each department.
- Get the details of employees who work in the "Marketing Department".
- Find all employees who do not have a salary entry.
- 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.
- Find all employees whose salary is higher than the average salary of their department.
- Find the employee id who gets the highest salary.

[Marks-10]

CLO-3
Level-3

2.	<p>Consider the following tables:</p> <p style="text-align: center;">Topic: DIU library Management</p> <p>DIU library management data where student's information is recorded, when a student borrowed a book, when he returned etc.</p> <div><div>StudentID: 024222000518888888 StudentName: Sumaiya StudentEmail: sumu23@gmail.com StudentPhoneNo:01789955454 BorrowID: 04</div><div>DepartmentName: SWE DepartmentNo: 35 BorrowedDate: 20-04-24 ReturnDate: 04-05-24</div></div> <table><tr><th>BookID</th><th>BookName</th><th>AuthorName</th><th>Publisher</th></tr><tr><td>04</td><td>To Kill a Mockingbird</td><td>Harper Lee</td><td>HarperCollins</td></tr><tr><td>05</td><td>1984</td><td>George Orwell</td><td>Penguin Books</td></tr><tr><td>06</td><td>The Great Gatsby</td><td>F. Scott Fitzgerald</td><td>Scribner</td></tr></table>	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		
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	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]	CLO-4 Level-4																
	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) <table><tr><th>Student_Id</th><th>Student_name</th><th>Student_Address</th><th>Course_no</th><th>Course_title</th></tr><tr><td></td><td></td><td></td><td></td><td></td></tr></table> <p>Explain the current normalization level of the given table.</p>	Student_Id	Student_name	Student_Address	Course_no	Course_title						[Marks-2]							
Student_Id	Student_name	Student_Address	Course_no	Course_title															
3.	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																
4.	a) Demonstrate the transaction properties along with an explanation of any two properties, and explain the states of the transaction.	[Marks-3]	CLO-5 Level-2																
	b) Define each component of ACID properties, and how they ensure reliability, integrity, and concurrency control in database transactions.	[Marks-2]																	