



Daffodil International University
Department of Software Engineering
Faculty of Science & Information Technology
Final Examination, Fall 2024

Luid

Course Code: SE 223; Course Title: Database Systems
Sections & Teachers: All

Time: 1.30 Hrs

Marks: 25

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.]

Scenario 1: Library Management System:			
1.	A public library has several branches across different cities in Bangladesh. Each <u>branch</u> is identified by a unique <u>branch number</u> , along with its <u>street</u> , <u>city</u> , <u>state</u> , <u>zip code</u> , and <u>phone number</u> . The daily operations of the <u>branch</u> are managed by a <u>librarian</u> or a team of <u>staff</u> , each assigned a <u>staff number</u> , <u>name</u> , <u>position</u> , and <u>salary</u> . Each branch maintains a collection of <u>books</u> . Information stored for each book includes a <u>catalog number</u> , <u>book number</u> , <u>title</u> , <u>genre</u> , <u>daily rental fee</u> , <u>cost</u> , <u>availability status</u> , and the names of the <u>authors</u> and <u>publisher</u> . Multiple <u>copies</u> of the same book can be found at a branch, and individual copies are distinguished using the <u>book number</u> . Before borrowing a book, individuals must register as <u>library members</u> by providing their <u>member number</u> , <u>first and last name</u> , <u>address</u> , and the <u>date they joined the library</u> . Once registered, a member can borrow up to five books at a time. For each <u>borrowed book</u> , details such as <u>rental number</u> , <u>member name and number</u> , <u>book number</u> , <u>title</u> , <u>rental fee</u> , and the <u>dates borrowed and returned</u> are recorded. A unique rental number tracks all transactions across the library network.		
a)	Identify schema for the above mentioned scenario 1.	[Marks-4]	CLO-1 Level-4
b)	Analyze the three levels of abstraction for the library management system	[Marks-3]	
c)	Examine the key responsibilities of a Database Administrator in ensuring data integrity and consistency when managing in the company's database?	[Marks-3]	
2. a)	Illustrate an Entity Relationship Diagram identifying their entity, attributes & relationship using scenario 1.	[Marks-4]	CLO-2 Level-4
b)	From this scenario 1, point out candidate key, primary key, alternate key, foreign key, and Composite key with explanation.	[Marks-2]	
c)	Consider the following Schema and Solve with Relational Algebra for the following questions. Branch (<u>branch_number</u> , street, city, state, zip_code, phone_number) Staff (<u>staff_number</u> , name, position, salary, branch_number) Video (<u>catalog_number</u> , video_number, title, category, daily_rental, cost, status, branch_number) Member (<u>member_number</u> , first_name, last_name, address, registration_date, branch_number)	[Marks-4]	

- Retrieve the street and zip code for all branches that have a branch number greater than 'B050'
- Find out the first names and last names of members who are registered at branches with a branch number 'B101' and 'B102'.
- Retrieve the title and category of all videos that have a daily rental fee greater than 30.
- Find all members who registered in the year 2023.

3.

Emp_ID	Emp_name	Emp_address
E101	Alif	Mirpur
E102	Raihan	Uttara
E103	Rani	Mirpur
E104	Mila	Savar
E105	Alamin	Uttara
E106	Maisha	Savar
E107	Azmi	Farmgate

Project_ID	Emp_ID
P1	E103
P2	E104
P3	E105
P4	E103
P5	E104
P6	E107

Employee

Project

Solve SQL command to express each of the following queries:

- Create those two tables using key constraints ✓
- Insert data into above two tables.
- Add a new column Emp_salary in the employee table using the alter command and Project_start_date in the Project table.
- Delete the column Emp_address from the employee table.
- Rename the column name Emp_ID as Employee_Id from the employee table.

[Marks-5]

CLO-3
Level-3