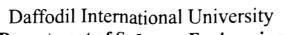
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Department of Software Engineering Faculty of Science & Information Technology Final Examination, Fall 2024

Course Code: SE 223; Course Title: Database Systems

Sections & Teachers: All

Time: 1.30 Hrs

Marks: 25

Luida

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 branch is identified by a unique branch number, along with its street, city, state, zip code, and phone number. The daily operations of the branch are managed by a librarian or a team of staff each assigned a staff number, name, position, and salary. Each branch maintains a collection of books Information stored for each book includes a catalog number, book number, title, genre, daily rental fee, cost, availability status, and the names of the authors and publisher. Multiple copies of the same book can be found at a branch, and individual copies are distinguished using the book number. Before borrowing a book, individuals must register as library members by providing their member number, first and last name, address, and the date they joined the library. Once registered, a member can borrow up to five books at a time. For each torrowed book, details such as cental number, member name and number, book number, title, rental fee, and the dates borrowed and returned are recorded. A unique rental number tracks all transactions across the library network.

i,	<i>a</i>	Identify schema for the above mentioned scenario 1.	[Marks-4]	CLO-1				
	b	Analyze the three levels of abstraction for the library management system		Level-4				
	<i>c</i>)	Examine the key responsibilities of a Database Administrator in ensuring data integrity and consistency when managing in the company's database?	[Marks-3]					
2.	<i>a</i>)	Illustrate an Entity Relationship Diagram identifying their entity, attributes & relationship using scenario 1.	[Marks-4]	CLO-2 Level-4				
	<i>b</i>	From this scenario 1, point out candidate key, primary key, alternate key, foreign key, and Composite key with explanation.	[Marks-2]					
	c) fol	Consider the following Schema and Solve with Relational Algebra for the lowing questions.	[Marks-4]					
1	Br Sta	<pre>anch(branch_number, street, city, state, zip_code, phone_number) aff(staff_number,name,position, salary, branch_number)</pre>						
	Vic	deo(catalog_number, video_number, title, category, daily_rental, cost, tus, branch_number)						
	Me	ember(member_number, first_name, last_name, address, registration_date, nch number)						

 b) Find out the first names and last names of members who are registered at branches with a branch number 'B101' and 'B102'. c) Retrieve the title and category of all videos that have a daily rental fee greater than 30. d) Find all members who registered in the year 2023. 								
	Emp_ID	Emp_name	Emp_address	Project_ID	Emp_			
	E101	Alif	Mirpur	P1 P2	E10			
	E102	Raihan	Uttara	P3	E104			
	E103	Rani	Mirpur	P4	E105 E103			
Ш	E104	Mila	Savar	P5	E103			
	E105	Alamin	Uttara	P6	E107			
\parallel	E106	Maisha	Savar			•		
	E107	Azmi	Farmgate					
E	mployee			Project				
П			press each of the	following queries:	[Marks-5]	CLO-3		

	II.	Insert data into above two tables.	
	III.	Add a new column Emp_salary_in the employee table using the	
		alter command and Project_start_date in the Project table.	
	IV.	Delete the column Emp_address from the employee table.	
	V.	Rename the column name Emp_ID as Employee_Id from the	
		employee table.	