

International Islamic University Chittagong (IIUC)

Department of Electronic and Telecommunication Engineering

Semester End Examination

Program: **B.sc (Engg.)**
 Course Code: **ETE-4757**
 Total Marks: **50**

Semester: **Autumn 2022**
 Course Title: Database Management Systems
 Time: **2 Hours 30 Minutes**

(i) Answer all the questions. The figures in the right-hand margin indicate full marks.
 (ii) Course Outcomes (COs) and Bloom's Levels are mentioned in additional Columns.

Course Outcomes (COs) of the Questions

CLO1	Familiarisation with the database system, RDBMS, SQL, transaction processing and concurrency control.
CLO2	Design and development of a database application system

Bloom's Levels of the Questions

Letter Symbols	R	U	Ap	An	E	C
Meaning	Remember	Understand	Apply	Analyze	Evaluate	Create

Part A

Q1.	a)	Consider the following tables. Give an expression in SQL for each of the following queries EmployeeDetails (EmpId, FullName, ManagerId, DateOfJoining, City) EmployeeSalary (EmpId, Project, Salary, Variable) <ul style="list-style-type: none"> Fetch the different projects available from the EmployeeSalary table. Find the maximum, minimum, and average salary of the employees. Fetch all the employees who either live in California or work under a manager with ManagerId – 321. Display the total salary of each employee adding the Salary with Variable value. fetch the employees whose name begins with any two characters, followed by a text "hn" and ends with any sequence of characters. 	CLO1	U, Ap	10
Q2.	a)	Explain the distinctions among the terms primary key, candidate key, and superkey.	CLO1	R, U	4

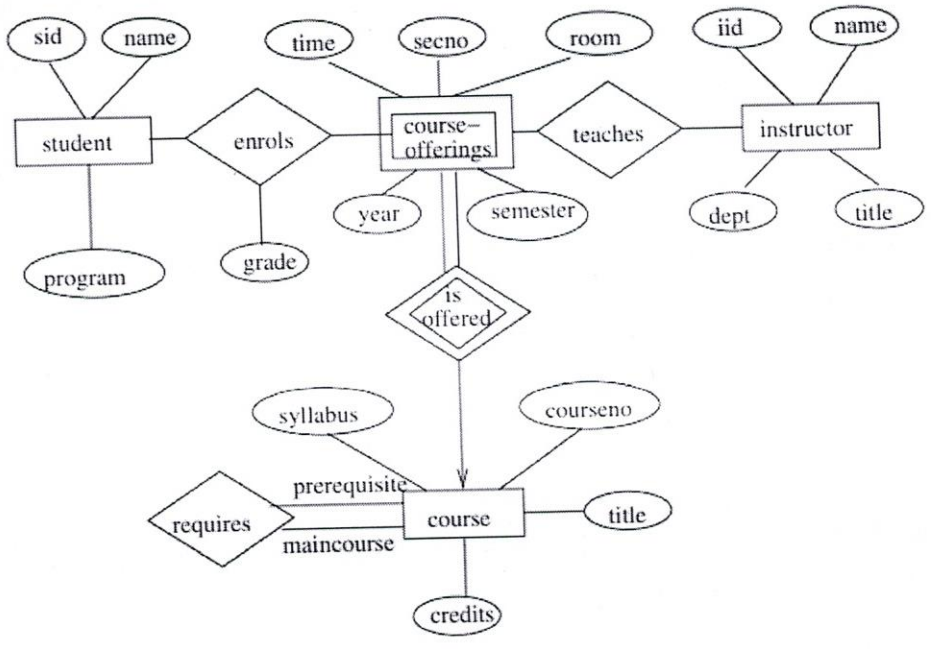
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	b)	Construct an E-R diagram for a hospital with a set of patients and a set of medical doctors. Associate with each patient a log of the various tests and examinations conducted.	CLO2	U, An	6
OR					
Q2.	a)	Define E-R diagram. How does it help us to design a complex database?	CLO2	R, U	4
	b)	Construct appropriate tables for the following E-R diagrams. 	CLO2	U, An	6
Part B					

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Q3.	a)	<p>Consider the following tables. Give an expression in SQL for each of the following queries</p> <p>Salesman(<u>salesman_id</u>, name, city, commission)</p> <p>Orders (<u>ord_no</u>, purch_amt, ord_date, customer_id, salesman_id)</p> <p>Customer(<u>customer_id</u>, cust_name, city, grade, salesman_id)</p> <ul style="list-style-type: none">• Write a SQL query to find all the orders issued by the salesman 'Abir'. Return ord_no, purch_amt, ord_date, customer_id and salesman_id.• Write a SQL query to determine the commission of the salespeople in Paris. Return commission.• Write a SQL query to count the number of customers with grades above the average in New York City. Return grade and count.	CLO1	U, Ap	10
OR					
Q3.	a)	<p>Consider the relational database, where the primary keys are underlined.</p> <p>Give an expression in SQL for each of the following queries:</p> <p>Employee (<u>person_name</u>, street, city)</p> <p>Works (<u>person_name</u>, company_name, salary)</p> <p>Company (<u>company_name</u>, city)</p> <p>Manages (<u>person_name</u>, manager_name)</p> <ul style="list-style-type: none">• Find the names of all employees who work for the First Bank Corporation.• Find the names, street address, and cities of residence of all employees who work for First Bank Corporation and earn more than \$10,000 per annum.• Find the names of all employees who earn more than every employee of Small Bank Corporation.	CLO1	U, Ap	10
Q4.	a)	<p>Explain functional dependency and partial dependency with examples. Write down the objectives of Normalisation.</p>	CLO2	R, U	5

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	b)	Apply 1NF, 2NF and 3NF on the following table named TEACHER.				CLO2	U, Ap	5																				
		<table border="1"><thead><tr><th>T_ID</th><th>Subject</th><th>Post_Code</th><th>Address</th></tr></thead><tbody><tr><td>101</td><td>Java Web Design</td><td>4207</td><td>Firozshah</td></tr><tr><td>102</td><td>C</td><td>4204</td><td>Patenga</td></tr><tr><td>103</td><td>Database Computer network</td><td>4225</td><td>Halishshar</td></tr><tr><td>104</td><td>C++</td><td>4214</td><td>Jalalabad</td></tr></tbody></table>	T_ID	Subject	Post_Code				Address	101	Java Web Design	4207	Firozshah	102	C	4204	Patenga	103	Database Computer network	4225	Halishshar	104	C++	4214	Jalalabad			
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Where prime attribute set = {T_ID, Subject}. Post_Code is functionally dependent on T_ID, also Address is functionally dependent on Post_Code																												
Q5.	a)	What is a transaction? Explain its ACID properties with examples.				CLO1	R, U	5																				
	b)	Explain Transaction Management in Database Management Systems. Explain Boyce-Codd Normal Form with an example.				CLO1	R, U	5																				