

International Islamic University Chittagong

Department of Computer Science and Engineering

B. Sc. in CSE

Final Exam, Autumn 2021

Course Code: CSE 2424

Course Title: Database Management Systems Lab

Time: 3 Hours

Full Marks: 50

The figures in the right-hand margin indicate full marks

Below is a selection from the "Orders" table:-

<u>OrderID</u>	CustomerID	EmployeeID	OrderDate	ShipperID
10308	2	7	1996-09-18	3
10309	37	3	1996-09-19	1
10310	77	8	1996-09-20	2

And a selection from the "Customers" table:-

<u>CustomerID</u>	CustomerName	ContactName	Address	City	PostalCode	Country
1	Alfreds	Maria Anders	Obere Str. 57	Berlin	12209	Germany
2	Ana	Ana Trujillo	Avda. de la Constitución 2222	México D.F.	05021	Mexico
3	Antonio Moreno	Antonio Moreno	Mataderos 2312	México D.F.	05023	Mexico

Q.1.

a. Write a SQL statement which creates the "Orders" table and the "Customers" table with the given information.

[here OrderID and CustomerID is the primary key]

CO3 App 30

b. Write a SQL statement which selects all the customers from the country "Mexico", in the "Customers" table.

c. Write a SQL statement which SQL statement selects all customers from the "Customers" table, sorted by the "Country" column

d. Write a SQL statement updates the first customer (CustomerID = 1) with a new ContactName = 'Alfred Schmidt', City= 'Frankfurt'.

e. Write a SQL statement deletes the customer "Alfreds Futterkiste" from the "Customers" table.

- f. Write SQL statement which selects all orders with customer information. [SQL Inner Join]
- g. Write a SQL statement which selects all customers, and all orders. [SQL Full outer Join]
- h. Write a SQL statement which finds the number of Customers.
- i. Write a SQL statement which selects all customers with a CustomerName that have "fre" in any position.
- j. Write a SQL statement which adds an "Email" column to the "Customers" table

Q.2

For information on multivalued dependencies and 4NF, review the slides.

CO1 U 10

Suppose we have the following Courses table with columns CourseID, Instructor, Book that stores the courses, the instructor teaching the course, and the recommended books for the course. The book(s) recommended for a course does not depend on the teacher teaching the course, just on the course. Here is an example of instantiation for this table:

Courses:

CourseID	Instructor	Book
IT360	Crainiceanu	Kroenke
IT360	Crainiceanu	Welling
IT360	DeLooze	Kroenke
IT360	DeLooze	Welling
SI440	Crainiceanu	Kroenke
SI440	Crainiceanu	Ramakrishnan
SI440	Crainiceanu	Stonebraker

- a) Give an example of a multivalued dependency in the Courses table.
- b) Is the Courses table in 4NF? If answer to yes, say why. If not, decompose the table such that the resulting tables are in 4th normal form. For each of the resulting tables, give the table name, column names, primary keys, and foreign keys.

Q.3

For a table to be in Boyce-Codd normal form, the table must be in 1NF and the determinants of all the functional dependencies in that table must be candidate keys (either primary key or alternate key). Below is the Rentals table created for the DVD-by-mail division of Netflix.

CO2 C 10

Rentals:

RentalID	Title	CustomerID	MailedOutDate	Director
1	Die Hard	1001	3/3/2010	John McTiernan
1	The last man	1001	3/3/2010	Walter Hill

	standing					
1	Wedding Crashers	1001	3/3/2010	David Dobkin	New	\$5.50
2	Dodgeball	1002	3/4/2010	Rawson Marshall Thurber	New	\$5.50
2	Die Hard	1002	3/4/2010	John McTiernan	Old	\$4.25
3	As good as it gets	1003	1/7/2011	James Brooks	Old	\$4.25
4	Forest Gump	1001	1/7/2011	Robert Zemeckis	Old	\$4.25

The primary key of the Rentals table is the composite key (**RentalID**, **Title**).

- a) Explain the conditions under which the following functional dependency is true:
RentalID --> CustomerID
- b) Based on the sample data on the table, is the functional dependency
RentalID --> CustomerID true?
- c) Explain the conditions under which the following functional dependency is true:
Director --> Title
- d) Based on the sample data on the table, is the functional dependency
Director --> Title true?
- e) Based on your general knowledge of movies and rentals, is the functional dependency Director --> Title true?
- f) Write a functional dependency that expresses the fact that the cost of all movies in a given category is the same.