EASTERN UNIVERSITY, SRI LANKA

DEPARTMENT OF MATHEMATICS

EXTERNAL DEGREE EXAMINATION IN SCIENCE – 2008/2009

SECOND YEAR, SECOND SEMESTER (April /May, 2016)

EXTCS 203- DATABASE DESIGN

(REPEAT)

er all questions   Time: 2 Hours

a) Define clearly the terms *Database* and *Database Management System (DBMS)*.

b) State the *advantages* and *disadvantages* of Database Management System.

c) Describe each of the following with a suitable example:

   i. Primary key;

   ii. Candidate key;

   iii. Foreign key.

d) Consider the following set of relational database schema representing a video shop. For each of the relation below, find the *primary keys*, *foreign keys* and *candidate keys*.

   (a) Customer (accountId, lastName, firstName, street, city, state, zipCode, balance)

   (b) Videotape (videoId, dateAcquired, movieId, storyId)

   (c) Movie (movieId, title, genre, length, rating)

   (d) Rental (accountId, videoId, dateRented, dateReturned, dateDue, cost)

a) State clearly what is meant by *normalization*?

b) What are the benefits of Database Normalization?

c) Define *first*, *second* and *third normal forms*.

d) The following table shows a snapshot of data that refer to the orders for de
of items of a local bakery. The bakery has been carrying out these process
years, but now wishes to computerize their functions.

Order No	Account No	Customer	Address	Date	Item	Quantity	Item Price
24	13	Ravi	Eravur	12/6/2013	Butter bun	20	15.00
					Pastry	13	20.00
					Cup cake	45	15.00
35	16	Ram	Kiran	19/6/2013	Butter bun	20	15.00
					Pastry	120	20.00
38	13	Ravi	Eravur	30/7/2013	Cream bun	100	18.00
					Pastry	20	20.00
					Cup cake	130	15.00
					Chocolate cake	30	50.00
40	23	Ragavan	Trinco	10/7/2013	Cup cake	15	15.00
					Danish cake	50	20.00
42	16	Ram	Kiran	12/7/2013	Cup cake	20	15.00
					Rich cake	3	50.00

Describe the process of normalizing the above table into tables of *thi*
form. State clearly any assumptions you made.

Q3.
a) Define each of the following:
   i)   Entity;
   ii) Attribute;
   iii) Entity-Relational (ER) diagram.

b) Assume a company in Batticaloa that wishes to build a website t
products. Besides storing information about products, the company
to store as much information as possible about users' activity and fee

You have been hired and assigned the task of designing the database required for this store. The requirements are listed as follows:

- Every user has a unique Id, a password, an email address and phone number.
- The company will contact users by email, therefore it is important to verify and record if the users' email addresses are accurate and active. Also, the details of whether the users wish to receive advertisements through email should be kept.
- The date of the users' last visit should be stored, in order for the web site to display a list of new products since the last visit.
- When a user views a product, the date and time they viewed it should be stored.
- Products have a product Id, product name, product description, manufacturer, price and quantity.
- There are different types of products. For Food products, the expiration date of the products needs to be stored. For Sports equipment, a message of safety use of the products should be stored. A piece of equipment can have more than one such message.
- For each purchase, the date of the sale, the product purchased, quantity purchased, and the details of the user who made the purchase should be stored.
- Users who have purchased products can upload comments to the website, and provide a rating between 1 and 10 for each product. Each comment must have a number (not necessary unique), a title, a rating and a text description.

Identify possible entities from the above description and draw an *ER diagram* for the database for the website. State clearly the assumptions if you made any.

Q4.

    a)   List down the major data types that *SQL* supports.

    b)   State the use of *SQL* language and give three *SQL* commands with examples.

    c)   Consider the database given below:

        Employee (EmployeeName, EmployeeCity, DateofBirth)

        Works (EmployeeName, BranchName, Salary)

        Company (BranchName, BranchCity)

    Give an expression in SQL for each of the following queries:

        i.   Find the names of all employees who were born in 1970.

        ii.   Display the employee name and salary with 15% increase.

        iii.   Find the names of all employees who work in the Eravur branc

        iv.   Retrieve the employees name and city whose salary is a 20,000.00 and 25,000.00.

        v.   Retrieve the employees' name whose city is same as the city d branch.