The Open University of Sri Lanka
Department of Mathematics and Computer Science
B. Sc. Degree Programme – Level 05
Closed Book Test 2009/2010
CSU 3278: Database Management Systems
Duration: One and half hours

Date 28.04.2010 Time: 4.00 p.m. to 5.30 p.m.

Answer ALL Questions.

A system is to be designed to support the running of an academic conference. Develop an entity relationship diagram for this system on the basis of the following information (make any reasonable or realistic assumptions):

Papers are submitted by authors to the conference. Submitted papers are, written by at least one author and often more than one. However, one author is always designated as the "corresponding author", which means that any correspondence regarding the paper is to be sent to that particular person. Naturally, when there is only one author, that person is also the corresponding author. Submitted papers are sent to independent reviewers (usually three per paper) for comment and assessment. Reviewers may, or may not, be authors of other submitted papers and also may, or may not, actually attend the conference itself. The reviewers of a paper return their comments and recommendation regarding whether or not the paper should be accepted for presentation at the conference. Papers that are recommended for acceptance by the reviewers are scheduled for presentation at the conference provided at least one of the authors registers to attend and present the paper in person.
Each accepted paper is assigned a specific slot (i.e. day, time and room) for presentation at the conference. Paper presentations may be run in parallel. That is, different presentations may be run on the same day and time but, in different rooms. Participants at the conference are required to pay a conference fee. The conference fee includes attendance at the paper presentation sessions, meals, accommodation (optional) and the conference dinner. Any special requirements that participants may need (e.g. as a result of disabilities or special dietary needs) also have to be recorded.

2.

i. Draw E-R diagrams showing the cardinality for each of the following:

   a. An invoice is sent to one customer, and many invoices can be sent to the same customer
   b. A part is used in many projects, and many projects may use the same part
   c. A person works in one department, and there are many persons in a department.
   d. A vehicle is owned by one person, and a person can own many vehicles.

e. Students take subjects. Each subject can be taken by many students, and each student can take many subjects
f. Persons apply for leans. Each loan must be made to one person, but each person can make many applications.
g. An operator can work on many machines, and each machine has many operators. Each machine belongs to one department, but a department can have many machines.

ii.

a. Why should relations be normalized?
b. What is the difference between a 2NF and a 3NF relation?
c. Consider the bill shown below. Obtain the relations in 1NF, 2NF and 3NF, stating appropriate justifications clearly.

Patient bill						
Patient #: 12345				Date: 7/20/09		
Patient Name: S. Perera				Date admitted: 7/14/09		
Patient Address: 300, Lake View				Discharge date: 7/17/09		
City-State-Zip: Colombo,80638						
Cost Center	Cost Name	Date Charged	Item Code	Desc	Charge	Bal Due
100	Room & Board	7/14/08	2000	Semi-prv room	200.00	
		7/14/08	2005	Television	5.00	
		7/15/08	2000	Semi-prv room	200.00	
		7/16/08	2000	semi-prv room	200.00	
				Subtotal		605.00
110	Laboratory	7/14/08	1580	Glucose	25.00	
		7/15/08	1585	Culture	20.00	
				Subtotal		45.00
125	Radiology	7/15/08	3010	X-ray chest	30.00	
				Subtotal		30.00
				Balance due		680.00