JARAMOGI OGINGA ODINGA UNIVERSITY OF SCIENCE AND TECHNOLOGY
UNIVERSITY EXAMINATION 2012/2013
1ST YEAR 2ND SEMESTER EXAMINATION FOR THE DEGREE OF MSC. INFORMATION SYSTEM
KISII LEARNING CENTRE

COURSE CODE: **IIS 5125**
TITLE: **DATABASE & E-COMMERCE INTEGRATION**
DATE: 19/4/2013 TIME: 8.00-11.00AM
DURATION: 3 HOURS

INSTRUCTIONS

1. This paper contains FIVE (5) questions
2. Answer question 1 (Compulsory) and ANY other 2 Questions
3. Write all answers in the booklet provided

Question 1

Equity bank is gaining popularity in East Africa and among small business entrepreneurs because of the small loans which they give to borrowers through Micro finance organizations such as Faulu Kenya. The idea is to bring venture lenders together using information technology. The loans are be used to finance start-up or development of the borrower's business, so that there is a realistic chance for repayment. The money in a loan can, unlike traditional loans, come from many lenders. As an Information systems expert, you've been contracted to design a model for the information system hence you must create an E-R model and a relational data model that describe the information necessary to manage Equity loans. The following information forms the basis for creating the model:

- Each borrower and lender must be registered with a name and address.
- A loan starts with a loan request, which contains information about when the loan should at latest be granted and how long the payback period will be. A description of how the money will be used is also included. The rate of the payment is calculated on the loan amount assuming the full amount is not paid.
- Lenders can commit to an optional portion of the total amount of a loan request.
- When the commitments for the loan request covers the requested amount, the request is converted to a loan. If not enough commitments can be reached, the loan request is cancelled. A borrower can have more than one request and more than one loan at a time, but can at most make one request per day.
- The loan is paid through an "intermediary", typically a micro finance organization which has a name and an address.
- The borrower chooses when he/she will make a payment. Every payment must be registered in the database with an amount and a date (at most one payment per loan per day). The lenders share the repayment based on how large a part of the loan they are responsible for.
- If the loan is not repaid before the agreed upon deadline, a new date is agreed. The database must not delete the old deadline, but save the history (the deadline can be overridden multiple times).
- Each lender can for each borrower save a "trust", which is a number between 0 and 100 that determines the lender's evaluation of the risk of lending money to that person. The number must only be saved for the borrowers, for whom there has been made such an evaluation.

a) Make an E-R model for the data described above. If you make any assumptions about data that doesn't show from the problem, they must be described. Put an emphasis on having the model express as many properties about the data as possible, for instance participation constraints. [15 Marks]

b) Make a relational data model for micro loans: Describe at least two of the relations using SQL DDL (make reasonable assumptions about data types), and state the relation schemas for the other relations. The emphasis is if there is a correlation between the relational model and the E-R diagram from a) above, along with primary key and foreign key constraints being stated for all relation. It is not necessary to state CHECK constraints and the like. [10 Marks]

c) The following relation schema can be used to register information on the repayments on micro loans (see the text in the problem a) for the explanation on micro loans, and the example on data about micro loans in problem b).
Repayment(borrower_id,name,address,loanamount,requestdate,repayment_date,request_amount).

A borrower is identified by a unique borrower_id, and has only one address. Borrowers can have multiple simultaneous loans, but they always have different request dates. The borrower can make multiple repayments on the same day, but not more than one repayment per loan per day.

i) State a key (candidate key) for Repayment. [1 Mark]

ii) Normalize the relation up to 3NF and for each normal form state functional dependency. [4 Marks]

Question 2

a) (i) Explain any eight unique features of e-commerce technology. [4 Marks]
(ii) How have the unique features of e-commerce technology explained in (i) above changed industry structure in the manufacturing business? [4 Marks]

b) (i) What are the major limitations on the growth of e-commerce? [3 marks]
(ii) Which of the limitations is potentially the toughest to overcome? [1 Mark]
c) (i) Explain the benefits of disintermediation to Internet users. [2 Marks]
(ii) How does disintermediation impact friction-free commerce? [1 Mark]

Question 3

a) (i) What is e-commerce? How does it differ from e-business? [2 Marks]
(ii) Discuss the various steps involved in creating an e-commerce site. [7 Marks]
b) (i) Why is a Web site so costly to maintain? [1 Mark]
(ii) Discuss the main factors that impact maintenance cost. [2 Marks]
c) What are the main differences between single-tier and multi-tier site architectures? [3 Marks]

Question 4

a) Discuss security breaches as they relate to each of the six dimensions of e-commerce security. For instance, what would be a privacy incident? [6 Marks]
b) (i) Explain some of the modern-day flaws associated with encryption. [3 Marks]
(ii) Why is encryption not as secure today as it was earlier in the century? [1 Mark]
c) Identify and discuss the five steps in developing an e-commerce security plan. [5 Marks]

Question 5

a) Name the different Web markup languages and explain the differences between them. [3 Marks]
b) What are the three basic building blocks of the Internet? [3 Marks]
c) Explain how Secure Socket Layer (SSL) certificates work. [4 Marks]
d) Explain the difference between a digital certificate and a digital signature. [1 Mark]
e) Discuss client side scripting and server side scripting. [4 Marks]