UNIVERSITY OF SWAZILAND

FACULTY OF SCIENCE

DEPARTMENT OF COMPUTER SCIENCE

SUPPLEMENTARY EXAMINATION 2007

Title of paper	:	Databases and their design I
Course Number	:	CS 345
Time allowed	:	Three (3) hours
Instruction	:	Answer **ANY FIVE** questions

This examination paper should not be opened until permission has been granted by the invigilator.

Question 1.

a) Describe the job of a systems analyst and three different end users. *[8]*

b) The advantages of a DBMS include increased productivity, data independence, controlled or eliminated redundancy.

i) How is productivity increased? *[3]*

ii) What is meant by data independency? *[2]*

iii) How is redundancy controlled? *[3]*

c) When and why is it not advisable to use a DBMS when you can afford one? *[4]*

Question 2.

a) Why is data abstraction is desirable? *[3]*

b) Differentiate between a DBA and a database designer. *[3]*

c) Briefly describe the three main data models. *[9]*

d) Differentiate between a relational database model and an unnormalised relation. *[5]*

Question 3.

a) What does it mean to qualify a name of an attribute and, how is it done? *[2]*

b) Give three advantages of the relational database and two disadvantages. *[5]*

c) What is the relationship between the network model and the CODASYL model? *[3]*

d) Briefly describe how a database, that is not a tree, can be implemented by means of a hierarchical model scheme. *[5]*

e) What are the advantages of the hierarchical model over the other two models? What are the advantages? *[5]*

Question 4.

a) Why is it important that every relation has a primary key? *[2]*

b) In a database system, how would you differentiate a relation from a relationship? *[3]*

c) Draw an E-R diagram for a bookshop enterprise to show the relationship between books, publishers, authors and editors. *[8]*

d) Using the database in some bookshop enterprise, describe existence dependence. *[4]*

e) How does existence dependence assist in the design of a database? *[3]*

Question 5.

a) Describe what you understand to be the purpose of generalisation? *[5]*

b) How does generalisation assist in the design of database systems? *[5]*

c) Using a bookshop enterprise describe both generalisation and aggregation (using entities of your choice). *[10]*

Question 6.

a) At this University we have lecturers, courses, programmes, faculties, etc. Use your knowledge of this institution to draw an E-R diagram illustrating aggregation. *[10]*

b) Reduce the E-R diagram in a) into tables indicating all keys. *[10]*