KENYA METHODIST UNIVERSITY
1ST TRIMESTER 2008, EXAMINATION

FACULTY	**:**	**SCIENCE AND SOCIAL STUDIES**
DEPARTMENT	**:**	**COMPUTER INFORMATION SCIENCE**
COURSE CODE	**:**	**COMP 340/MISC 332**
COURSE TITLE	**:**	**DATABASE MANAGEMENT SYSTEMS**
TIME	**:**	**2 HOURS**

Instruction:
Answer question one and answer two other questions.

QUESTION ONE (30 MARKS)

1. SQL is a data sub language, explain the six basic SQL statements used (6Mks)

2. Write SQL statements that could create the following data structure

StudentID*	Name	Advisor	Dept	Faculty	Year	GPA
Mac-1-01-07	Peter	Juma	CIS	Sciences	2007	2.93
Bus-0-07-03	Jane	Abdih	BBA	Business	2008	3.01
Mac-0-02-08	Mary	Henry	CIS	Sciences	2008	3.32
Bus-1-01-06	Andrew	Abdih	BBA	Business	2007	2.79
Mac-1-03-07	John	Juma	CIS	Sciences	2008	3.42

(10Mks)

3. Explain domain and integrity constraints in structured query language (5Mks)

4. Briefly explain the properties of transaction that a DBMS must maintain (4Mks)

5. The following query has been issued against a database

   $\pi_{\text{Course\#, CName}}(\sigma_{\text{course.course\# = adopt.course\# AND text.bookID = adopt.bookID AND text.publisher = 'Focus books' AND dept = 'Computer Science'}}(\text{Course X Adopt X Text}))$

   Draw a corresponding query tree for this query, explaining the steps you have gone through (5Mks)

QUESTION TWO (15 MARKS)

1. Making a data structured relational is achieved by the process of normalization. Normalize the following data structure to its 3rd normal form. (6Mks)

Purchases
Customer_name
Customer_address
Customer_country_code
Customer_phone
Product_1_name
Product_1_quantity
Product_2_name
Product_2_quantity
Product_3_name
Product_3_quantity
Total_cost

2. Explain the three levels and mappings in relation to the database architecture (9Mks)

QUESTION THREE (15 MARKS)

1. Using a diagram, discuss the database analysis life cycle (12Mks)

2. Showing with diagrams, at least three categories of cardinality of the relationships (3Mks)

QUESTION FOUR (15 MARKS)

1. A requirement that a department sponsors project(s) that are monitored by employees who manage the department for a given period of time. Using the following schema, draw an ER model

   Employee(SSN,name,lot)
   Project(pID,start_on,pbudget)
   Department(dID, dname,budget) (10Mks)

2. Define on data model and what is it comprised of, and give examples of data models 5Mks)

QUESTION FIVE (MARKS)

1. Describe the three main relational algebra operations implemented in DBMS (9Mks)

2. Write the relational algebra of the following SQL statement:

```
SELECT    name,DoB,title
FROM      movieStar,StarsIn
WHERE     name=starName AND year=1996 AND gender='F';
```
(6Mks)