KIBABII UNIVERSITY COLLEGE
(A Constituent College of MasindeMuliro University of Science Technology)
P.O. Box 1699-50200 Bungoma, Kenya
Tel. 020-2028660/0708-085934/0734-831729
E-mail: enquiries@kibabiiuniversity.ac.ke

UNIVERSITY REGULAR EXAMINATIONS

2013 /2014 ACADEMIC YEAR

SEMESTER EXAMINATIONS

(MAIN EXAMINATION)

FOR THE DIPLOMA IN INFORMATION TECHNOLOGY

COURSE CODE : DIT 059

COURSE TITLE: DATABASE SYSTEMS

DATE: 14TH AUGUST ,2014 **TIME:** 9:00A.M.-11:00A.M.

INSTRUCTIONS TO CANDIDATES:

Attempt question **ONE (1)** and **ANY TWO (2)** other questions from section B.

Question 1 (24 Marks)

a) Define the following terms,
   i) Database
   ii) Entity
   iii) Key attribute
   iv) Relationship
   v) Schema

(5Marks)

b) Briefly explain the following concepts in reference to the 3-level ANSI database architecture.
   i. Logical data independence
   ii. Physical data independence

(4 Marks)

c) Define the terms Data Definition Language and Data Manipulation languageas used in SQL, giving an example SQL command for each type. (5 Marks)

a) List the various components that make a database system, giving a brief description of their functions. (10 Marks)

Question 2

a) Define database normalization [2 marks]

b) Explain why normalization is used databases [2 marks]

c) The relational set operators UNION, INTERSECT, and MINUS work properly only when the relations are union-compatible. What does union-compatible mean, and how would you check for this condition? [2mks]

d) Suppose you have two tables: EMPLOYEE and EMPLOYEE_1.
The EMPLOYEE table contains the records for three employees: Alice Njeri, John kioko, and Anne Nanjala.
The EMPLOYEE_1 table contains therecords for employees John Kioko and Mary Omondi.
   i) Given that information, list the query output for theUNION query.[2mks]
   ii) Given the employee information in (d), list the query output for the UNION ALL query. [2mks]
   iii) Given the employee information in question (d) list the query output for the INTERSECT query. [2mks]
   iv) Given the employee information in (d), list the query output for the MINUS query of EMPLOYEE toEMPLOYEE_1. [2mks]

e) Outline the procedure used to create a select query in access [4 mks]

Question 3

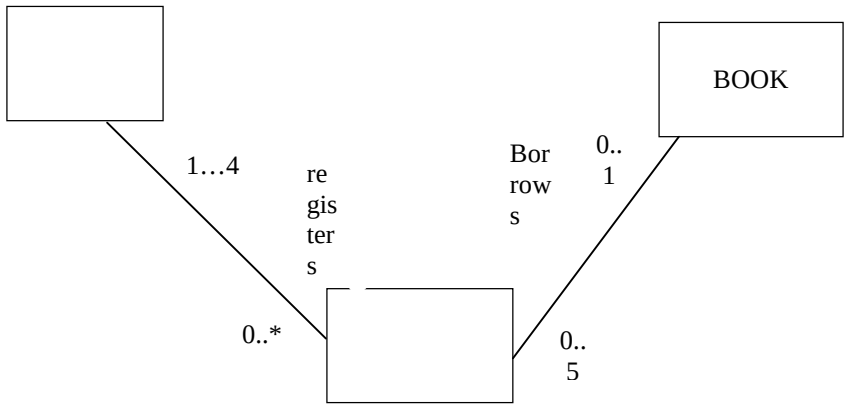
a) Explain two types of data mapping as used in databases [4mks]

b) Why would you advice a client to use a DBMS instead of a file based system [4MKS]

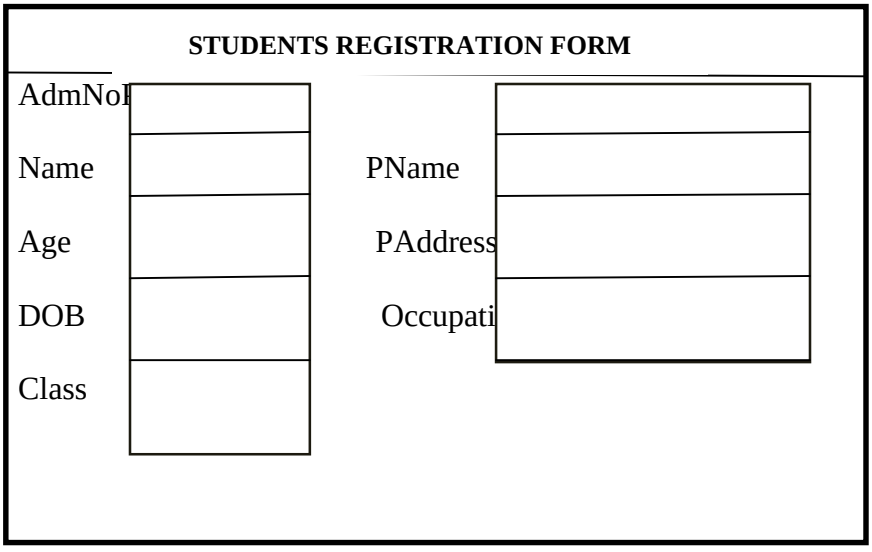
c) In the E-R diagram below state:

i. The multiplicity constraint for the book student relationship [1mk]

ii. The participation of the course when relating with the student [1mk]



d) In a school system the details of the students and that of their guardians are stored manually by filling the following details in a form as shown in the diagram below before being stored in a spring file



i) Give two disadvantages of this system [2mks]

ii) If you are to computerize this system, Draw an E-R diagram drawing showing the possible entities, attributes, and relationships most appropriate for the system[4mks]

iii) Write the appropriate SQL commands that would create the database tables to represent your entities in an MySQL database [2MKS]

Question 4

a) Differentiate between a relationship and relation a database model. [2mks]
b) Explain the term functional dependency [2mks]
c) A foundation dealing with regulation of publication of books maintains a database consisting of 3 related tables whose structure is as shown below:

Book(bookCode, bookTitle, authorCode, pubCodedateOfPub)
Author(authorCode, authorName, authorCountry, authorContacts)
Publisher(pubCode, pubName, pubCountry, pubContacts)

N/B Assume that a book is written by one authorized and is from one publisher
An author may write many books,
A publisher publishes many books.

i) Draw an appropriate ERD for the above schema [3 mks]
ii) Write down an SQL state to:
a) Create the Author and Book table [2mks]

b) Change the contacts of the publisher whose code in 'pub12' to 12299 [1mk]

c) Insert a record into the authors table (use appropriate values [1mk]

d) List the total number books [1mk]

e) Display the titles of all books authored by 'Joseph Paul' [1mks]

f) Display the name of the author of the book 'Database Management' [1mks]
g) Display the titles of all books as well as the names of their authors and the names of their authors. Ensure that books of the same author are listed together in a group. [2mks]

h) List the names of the publishers who have published books authored by 'CJ Date' [2mks]

Question 5

a) In what ways can normalization be used to support database design? (2mks)

b) Discuss the different levels of normalization (6mks)

c) Normalize the table below to 3rd NF (6mks)

STUDENT_NO
Student Name
Course code
Course Title
Module Code
Module Title
No. Of credits
Grade Point
Result Code
Result

d) Distinguish between data security and data integrity [4mks]