KABARAK   **UNIVERSITY**

EXAMINATIONS

2009/2010 ACADEMIC YEAR
FOR THE DEGREE OF BACHELOR OF BUSINESS MANAGEMENT & INFORMATION TECHNOLOGY

COURSE CODE: BMIT 216

COURSE TITLE: DATABASE MANAGEMENT SYSTEMS

STREAM: Y2S1

DAY: WEDNESDAY

TIME: 9.00 – 12.00 P.M.

DATE: 09/12/2009

INSTRUCTIONS:

1. This question paper has **FIVE** questions
2. Answer question **ONE** and any other **THREE** questions

PLEASE TURN OVER

QUESTION ONE (40 MARKS) COMPULSORY

(a) Explain the meaning of the following terms
  i. Polymorphism
  ii. Inflow
  iii. Views
  iv. Rollback
  v. Schema   (10mks)

(b) Distinguish between
  i. Conceptual and logical database design
  ii. Data warehousing and data mining
  iii. Data administrator and database administrator   (6mks)

(c) Compare and contrast Web and Server-Client database architectures   (5mks)

(d) A secure system is a good system. Discuss four features that can be integrated into databases system to make it secure   (8mks)

(e) Consider a student relation with the details

RegNo	Surname	OtherNames	Gender	DOB	DOA	CourseCode
65001	Kami	Rosemary	F	02/28/1989	05/13/2008	BMIT
65003	Maina	Emmanuel Tum	M	06/03/1988	05/13/2008	BSc
65004	Ali	Henry	M	03/17/1988	05/13/2008	BMIT

What is the output of the data if the SQL below is executed?

```
select regno, othernames+' '+surname as name, gender
from student
where progcode='BCOM'
```
                                                          (4mks)

(f) The following five relations are all in Third Normal Form and have been produced by normalization from books purchased by customers. Construct a Third Normal Form entity relationship (ER) model from these relations. Do not show optionality or include relationship names.   (7mks)

PURCHASE
purchaseOderNumber
purchaseDate
publisherCode

PUBLISHER
publisherCode
publisherName

ORDER
purchaseOderNumber
ISBN
Quantity

BOOK
ISBN
bookTitle
authorCode

AUTHOR
authorCode
authorName

QUESTION TWO (20 MARKS) ELECTIVE

(a) Explain the difference between flat files and databases (4mks)

(b) With the aid of diagrams explain hierarchical, network and relational database models (8mks)

(c) As a database expert, you have been invited to talk on the need of using object oriented databases. Part of the speech is to discuss RDBMS inadequacies that prompted the need of OOD. Discuss eight inadequacies that you might include in your speech (8mks)

QUESTION THREE (20 MARKS) ELECTIVE

(a) What is a many-to-many relationship (2mks)

(b) Explain how can a many-to-many relationship be resolved? (3mks)

(b) Below is a sample book purchases ordered by customers

order		
ISBN	**PON**	**quantity**
0077074092	34673	3
0077077253	34673	15
0077077253	35332	5
007709073X	34673	20
0333197399	34674	17
0333371003	34674	2

purchase		
PON	**POD**	**publisherCode**
34673	10/20/1995	MCG
34674	10/21/1995	MAC
35332	11/30/1995	MCG

book		
ISBN	**bookTitle**	**authorCode**
0077074092	Systems Analysis	E753
0077077253	Introduction to SSADMA4	A234
007709073X	SSADMA A Practical Approach	G101
0333197399	Database Fundamentals	S593
0333371003	Database Principles	S593

Using the information given above,

i. write an SQL statement that creates ORDER table using appropriate data types and corresponding data type lengths and that includes the following constraint; maximum qty supplied must be at least one (5mks)

ii. write an SQL statement that displays total number of books purchased before November 1995 (3mks)

iii.   What is the output of the following SQL statement?   (4mks)
```
SELECT order.*, book.booktitle
FROM order, book
WHERE book.ISBN=order.ISBN and quantity>10
Order by bookTitle
```

iv.   List the output that results from the following relational algebra version   (3mks)

$\Pi_{ISBN, PON}(\alpha_{qty<10}(ORDER))$

QUESTION FOUR (20 MARKS) ELECTIVE

(a) Define DFDs and explain their importance in computer programming   (4mks)

(b) Describe the four components of a data flow diagram   (4mks)

(c) Explain what a context diagram is   (2mks)

(d) Study the following scenario for *Tumaini Company Inc.* billing system and use it to produce a level 1 DFD   (10mks)

```
To make their orders, customers of Tumaini Company Inc. present
their orders to the Sales Desk.  The Sales Desk record the
customer's details in their system then pass over the basic
order to Stock Office who process order item details using
stock data details from the company's system.  The processed
details are then stored in the stock data and the detailed
order presented to the company's Accounts Office to process the
detailed customer order using the customer's details that
include the customer's address, stores the details  in the
atheir orders.
```

QUESTION FIVE (20 MARKS) ELECTIVE

(a) Model the following scenario using ER diagrams. Resolve many to many relationships if they exist.   (10mks)

```
A COURSE must have one or more ASSESMENTs and an ASSESMENT
must belong to only one COURSE.  An ASSESMENT must be
undertaken by one or more STUDENTs and STUDENT must
undertake one or more ASSESMENTs.
A PROGRAMME must have only one LECTURER as a PROGRAMME
leader and a LECTURER must lead only one PROGRAMME (i.e.
Lecturers don't have to be programme leaders, but if they
are, they lead only one programme).  A STUDENT must have
only one LECTURER as a personal tutor and a LECTURER may
be personal tutor to a one or more STUDENTs.
```

(b) The following data shows an instance of invoice given to customers on projects carried out for them. Each active customer is invoiced once a month for the work performed in the previous month. The Start and Finish Date refer to the overall project but the Person Days column refers to only those worked in that particular month. Normalize the invoice to Third Normal Form. (10mks)

Invoice No.	3412	**Date of Invoice**	23/1/2008
Customer No.	3475	**Customer Name**	Kami Agnes
Customer Address	P.O Box Private Bag, Nyumbani		

Project Id	Project Description	Start Date	Finish Date	Person Days	Cost
NA1	New Accounts	12/8/2008	11/11/2008	13	Sh.130000
DS2	Delivery System	3/3/2008	30/11/2008	58	Sh.450000
				Total Cost	Sh.580000