KABARAK UNIVERSITY

UNIVERSITY EXAMINATIONS

2009/20010 ACADEMIC YEAR

FOR THE DEGREE OF BACHELOR OF EDUCATION SCIENCE

COURSE CODE: COMP 314

COURSE TITLE: DATABASE MANAGEMENT SYSTEMS

STREAM: SESSION V

DAY: FRIDAY

TIME: 9.00 – 11.00 A.M.

DATE: 13/08/2010

INSTRUCTIONS:

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

PLEASE TURNOVER

QUESTION ONE (30 MARKS) COMPULSORY

(a) What is meant by the following terms
   (i) Candidate key
   (ii) Views
   (iii) Relational algebra
   (iv) Database integrity (8mks)

(b) Explain the distinction between business and referential integrity giving an example of each (4mks)

(c) Consider the following PARTS, SUPPLIER, SUPPLIEDPARTS and CITY relations that resulted from normalization to third Normal Form.

PARTS	**SUPPLIER**	**SUPLLIEDPARTS**	**CITY**
PartNo	SuppId	PartNo	CityCode
Description	SuppName	SuppNo	CityName
Colour	CityCode	Quantity	Country

i. Identify the primary, foreign and compound keys in the schema (3mks)

ii. Given that PartNo, SuppNo and Quantity are all of integer data types, write an SQL statement that creates BOOKING table (4mks)

iii. Draw an Entity Relationship diagram involving the four entities. Do not show cardinalities or relationship names. (3mks)

(d) Give four examples of database problems that can be recovered by roll back recovery (2mks)

(e) Data warehousing comes with a number of benefits. Explain any three of these benefits (6mks)

QUESTION TWO (20 MARKS) ELECTIVE

(a) Databases are used virtually in all spheres of human day-to-day activities. Identify and explain three areas where databases are commonly used. (6mks)

(b) Before embarking on databases, one has to involve almost all of the database development life cycle (DBLC). Why is it important to involve DBLC in database development? (3mks)

(c) Explain the following database design approaches giving an example of each
   i. Top down
   ii. Down up (5mks)

(d) One of the stages in DBLC is Requirement Analysis that involves collection of user requirements. Describe three key issues involved in this stage of database development (6mks)

QUESTION THREE (20 MARKS) ELECTIVE

(a) SQL is a *non-procedural* programming language. Distinguish between procedural and non-procedural programming languages (2mks)

(b) What the functions of each of the following SQL commands

i. DROP TABLE
ii. SELECT
iii. INSERT INTO
iv. GRANT (4mks)

(c) Below is a sample data for bookings by customers' database

CUSTOMER

CusNo	Name	Address
1027	Noel	17 Nyumbani
1598	Abigael	77 Maji Kavu
2030	Joash	13 Shauri Moyo
4786	Nora	27 Paleni

ROOM

RmNo	Type	Rate
12	Double	KSh.1500
33	Single	KSh.1000
36	Single	KSh.500
41	Single	KSh.500

BOOKING

CusNo	RmNo	StartDate	EndDate
1027	36	27/6/2010	28/6/2010
1027	41	28/8/2010	28/8/2010
2030	36	28/8/2010	30/8/2010
4786	12	28/8/2010	28/8/2010

Using the information given above,

i. write SQL statement that creates BOOKING table using appropriate data types and corresponding data type lengths and includes the following constraint; CusNo and RmNo are positive numbers (5mks)

ii. write SQL statement that displays CusNo and RmNo booked for in the month of August 2010 starting date (4mks)

iii. What is the output of the following SQL statement? (4mks)

```
SELECT booking.*, cutomer.name, address
FROM booking, customer
WHERE booking.cusNo=customer.cusNo
```

iv. List the output that results from the following linear algebra relation (3mks)

$\Pi_{cusNo,\ rmNo}(\alpha_{startdate>1/8/2010}(BOOKING))$

QUESTION FOUR (20 MARKS) ELECTIVE

(a) Give four examples of data/information collected that require normalization (2mks)

(b) Differentiate between Second Normal and Third Normal form processes in normalization (4mks)

(c) During research stage a student came across the document below of books ordered by customers from *Hekima Bookshop*. Normalize the data to third normal form showing all the steps taken (10mks)

Purchase Order No.	Purchase Order Date	Publisher code	Publisher Name	ISBN	Book Title	Auth or Code	Author Name	Quantity
34673	20/10/05	MCG	McRaw-Hill	007709073 X	SSADM A Practical Approach	G101	Goodland	20
				0077077253	Introduction to SSADM4	A234	Ashworth	15
				0077074092	SSADM4: User Guide	E753	Eva	3
34674	21/10/05	MAC	McMillan	0333197399	Fundamentals of Databases	S593	Deen	17
				0333371003	Principals of Databases	S593	Deen	2
35332	30/11/05	MCG	McRaw-Hill	0077077253	Introduction to SSADM4	A234	Ashworth	5

(d) Draw an Entity Relationship diagram relating the entities produced from the third Normal Form in (c) above (4mks)

QUESTION FIVE (20 MARKS) ELECTIVE

(a) Explain the meaning of the following terms giving an example of each
   i. Unary relationship
   ii. Existence dependency (5mks)

(b) With the aid of a diagram, explain a many to many relationship and how it can resolved (5mks)

(c) Use Entity relationship (ER) diagram to model the following scenario: (10mks)
A SUBJECT *must* have *one or more* ASSESMENTs and an ASSESMENT *must* belong to *only one* SUBJECT. An ASSESMENT *must* be undertaken by *one or more* STUDENTs and a 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 *one or more* STUDENTs