



UNIVERSITY EXAMINATIONS 2013/2014 ACADEMIC YEAR

**1st YEAR EXAMINATION FOR THE DEGREE OF BACHELOR OF
SCIENCE IN COMPUTER SCIENCE**

COURSE CODE/TITLE: SCS 106: DATABASE SYSTEMS

END OF SEMESTER: II

DURATION: 3 HOURS

DAY/TIME: MONDAY 2.00 TO 5.00PM

DATE: 14.04.2014 (A1)

INSTRUCTIONS: Answer Question ONE and any TWO questions.

QUESTION 1 (40 Marks)

a. Define the following terms:

- i. Database management system DBMS
- ii. Database Schema
- iii. Database (6 Marks)

b. State any four roles performed by database administrator (4 Marks)

c. Differentiate between:

- i. entity type and entity set
- ii. attribute and value set
- iii. relationship instance and relationship type (6 Marks)

d. The Student relation below shows the details of students stored in a database. Use it to answer the question that follows:

STUDENTNO	STUDENTNAME	UNITCODE	MARKS
K001	Kelly	ICT	70
K002	Rose	HR	30
K003	Bronz	SECRETARIAL	50
K004	Emelda	MECHANICAL	30
K001	Kelly	HR	65
K003	Bronz	ICT	95

Write an SQL statement that will display each of the following output

i.

STUDENTNO	STUDENTNAME	UNITCODE	MARKS
K001	kelly	ICT	70
K003	Bronz	ICT	95

(3 Marks)

i.

STUDENTNO
K001
K002
K003
K004

(3 Marks)

iii.

MARKS
70
50
65
95

(3 Marks)

iv.

STUDENTNO	STUDENTNAME	UNITCODE	MARKS
K003	Bronz	ICT	95

(3 Marks)

e. An entity named student has the following attributes; *studentid* ,*name* ,*date_of_birth* ,*address* and *age*. The name is made up of the middle, last and firstname, while the address is made up of the street, city and code. Draw an entity type diagram to represent this information

(6 Marks)

f. Outline three disadvantages of a database management system

(6 Marks)

QUESTION TWO (15 Marks)

a. List any three components of a Database Management system(DBMS) (3 Marks)

b. Briefly describe the following properties of relation types

- i. Degree
- ii. Role
- iii. Constraints (6 Marks)

c. The Furniture table below shows details of furniture stored in a database. Use it to answer the questions that follows.

ITEMCODE	ITEMNAME	QUANTITY	ITEMPRICE	STATUS
F0001	Beds	300	12000	EXCESS
F0010	Table	200	7000	EXCESS
F0003	Sofa sets	100	35000	EXCESS
F0011	Wardrobe	50	18000	REORDER
F0014	Computer desks	145	3000	EXCESS
F0002	Chairs	45	1600	REORDER

Write a SQL statement that would

- i. Extract itemname of items whose status is reorder (1 Mark)
- ii. Determine the cost of each item and store them in a field named *totalcost* (2 Mark)
- iii. Extract all the details of items whose itemprice is greater than 15000 (1 Mark)
- iv. Sort the items according to the itemcode in ascending order (1 Mark)
- v. Delete the item whose itemcode is F0014 from the table (1 Mark)

QUESTION THREE (15 Marks)

a. List any three types of database end users (3 Marks)

b. Distinguish between:

- i. Total and partial participation constraint
- ii. Logical and physical data independence
- iii. Primary and composite key (6 Marks)

c. Briefly discuss the six phases of database design (6 Marks)

QUESTION FOUR (15 Marks)

- a. List any three characteristics of database approach (3 marks)
- b. Give a description of the following normal forms
- i. 1NF
 - ii. 2NF
 - iii. 3NF (6 Marks)
- c. Explain any three functions of Database management system (DBMS) (6 Marks)

QUESTION FIVE (15 Marks)

- a. Using diagrams clearly differentiate between the following relationship as used in a relational database
- i. One-to-One relationship
 - ii. One-to-Many relationship
 - iii. Many-to-Many relationship (6 Marks)
- b. Briefly highlight what is meant by integrity constraints and give four types constraints (6 Marks)
- c. Outline the advantage of using a relational database model over other models (3 Marks)