



TECHNICAL UNIVERISTRY OF MOMBASA

Faculty of Engineering & Technology

DEPARTMENT OF COMPUTER SCIENCE & INFORMATION TECHNOLOGY

UNIVERSITY EXAMINATION FOR DEGREE IN:
BACHELOR OF SCIENCE IN STATISTICS & COMPUTER SCIENCE
BACHELOR OF SCIENCE IN INFORMATION TECHNOLOGY
BACHELOR OF MATHEMATICS & COMPUTER SCIENCE
(BSSC 13S, BSIT 13S, BMCS 13S)

EIT 4205/ICS 2206: DATABASE SYSTM

END OF SEMESTER EXAMINATION

SERIES: DECEMBER 2014

TIME: 2 HOURS

Instructions to Candidates:

You should have the following for this examination

- Answer Booklet

This paper consists of **FIVE** questions. Attempt question **ONE (Compulsory)** and any other **TWO** questions
Maximum marks for each part of a question are as shown

This paper consists of **THREE** printed pages

Question One (Compulsory)

a) Define the following terms:

(i) Entity sets

(ii) Data warehousing

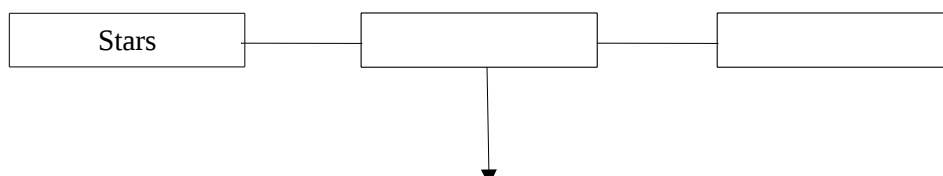
(iii) Constraints

(iv) Schema

(4 marks)

b) With a suitable example, state and explain any TWO application areas of database management system **(4 marks)**

c) Observe the below diagram and answer the following questions



- (i) State the type of relationship in the above diagram (1 mark)
- (ii) Explain in details the above diagram (4 marks)
- (iii) State the function of the arrow (1 mark)
- (iv) Give choices of the above entities that will allow to be replaced by on attribute

- d) State and explain the various types of constraints in database system (6 marks)
- e) Explain with a neat diagram the life cycle of a database system development (6 marks)

Question Two

- a) A laboratory has several chemist, who work on one or more projects. Chemist also may use certain kinds of equipments. There are employees in a chemist who access equipments. A chemist must be assigned one or more project.
 - (i) Draw ER diagram (8 marks)
 - (ii) Map associate entities to tables (3 marks)
- b) Write SQL statements to perform the following by using the below tables:

Last Name	First Name	Address	City
John	Olando	356	Thika
Mark	Juma		Nairobi
Lucy	Njoroge	253	Mombasa

- (i) To select customer table (1 mark)
- (ii) To retrieve last name and first name where the city is Mombasa (3 marks)
- (iii) To insert a row (Mike, John, 243, Embu) (3 marks)
- c) Write any TWO functions of a database Administrator (2 marks)

Question Three

- a) Define a weak entity (1 mark)
- b) Explain the term normalization and explain in detail the following:
 - (i) 1NF
 - (ii) 2NF
 - (iii) 3NF (9 marks)
- c) State and explain any FIVE characteristics of a typical database management system (10 marks)

Question Four

- a) Using a suitable example, differentiate the following terms used in database systems. (10 marks)
 - (i) Database Technology and File System
 - (ii) Referential Integrity and Domain Integrity
 - (iii) Binary Relationship and Ternary Relationship
 - (iv) Logical View and Physical View
 - (v) Data Mining and Data Warehousing

- b) With a suitable diagram describe the level database architecture, explain the purpose and the relationship between each level. **(10 marks)**

Question Five

The result of a multiple choice quiz are recorded in the format shown below:

Candidate ID C 103	Name Blur Smart	Address 17 Union Street	
Question No	Question Test	Correct Answer	Conduct Answer
Q1	In what is the shape	C	C
Q2	Who wrote Moby	B	A

All candidates sit exactly the same test. The questions are always presented in the same order as are the answers of each question. The candidate must choose between FOUR answers, labeled A – D for each question. Only one label represents the correct answer. In the above table, the candidate answered question Q1 correctly and question Q2 incorrectly.

- (i) Identify the repeating group of attributes and transform into tables that are in 3NF in tables that are in 1NF **(5 marks)**
- (ii) Identify any transitive dependencies and transform into tables that are in 3NF **(5 marks)**
- (iii) State any FIVE advantages of using Database Technology as opposed to flat file system to store data **(10 marks)**