



(Knowledge for Development)

KIBABII UNIVERSITY

(KIBU)

**UNIVERSITY EXAMINATIONS
2022/2023 ACADEMIC YEAR**

**END OF SEMESTER EXAMINATIONS
FIRST YEAR SECOND SEMESTER**

**FOR THE DIPLOMA IN
(INFORMATION TECHNOLOGY)**

COURSE CODE : DIT 059

COURSE TITLE : DATABASE SYSTEMS

DATE: 21/04/2023 TIME: 2.00 P.M. - 4.00P.M. 2HRS

INSTRUCTIONS TO CANDIDATES

ANSWER QUESTIONS ONE AND ANY OTHER TWO.

QUESTION ONE (COMPULSORY) (24 MARKS)

- a) Define the following terms **[4 Marks]**
- i. Database
 - ii. File
 - iii. Record
 - iv. Metadata
- b) Using diagrams, differentiate between Hierarchical Model and network model as used in database systems. **[6 Marks]**
- c) Explain four major database security threats that are often experienced. **[4 Marks]**
- d) SQL commands can be categorized into five categories based on their functionality. Outline the categories giving example for each. **[10 Marks]**

QUESTION TWO (18 MARKS)

- a) What is normalization? **[2 Marks]**
- b) Explain four goals one can achieve when normalizing a database? **[4 Marks]**
- c) Data security is based on foundational principles. Name and explain three principles that govern data security. **[6 Marks]**
- d) Outline the three advantages of Database Management Systems (DBMS) **[3 Marks]**
- e) Give reasons why we consider an entity a 'weak entity' and how is it represented in the database **[3 Marks]**

QUESTION THREE (18 MARKS)

- a) What is Structured Query Language (SQL)? **[2 Marks]**
- b) Discuss four rules of SQL that makes up a better schema **[8 Marks]**
- c) Differentiate between:- **[8 Marks]**
- i. Data and information
 - ii. Conceptual and Logical data model
 - iii. Volatile storage and Non-volatile storage
 - iv. Data redundancy and Data Independence

QUESTION FOUR (18 MARKS)

- a) What is Data modeling? **[2 Marks]**
- b) Give three advantages and disadvantages of a centralized database **[6 Marks]**

- c) ACID Properties are used for maintaining the integrity of database during transaction processing.
Explain what the ACID properties stand for and meaning in database? [10 Marks]

QUESTION FIVE (18 MARKS)

- a) What is a Database Schema? [2 Marks]
- b) Differentiate between Logical errors and System errors. [4 Marks]
- c) Outline two causes transaction failure in databases [4 Marks]
- d) Data security is based on three foundational principles, confidentiality being one of the principles explain the other two principles in the triad. [4 Marks]
- e) Define the following terms:-
- i. Tuple
 - ii. Derived attribute
 - iii. Entity
 - iv. Normalization