



(Knowledge for Development)

KIBABII UNIVERSITY

**UNIVERSITY EXAMINATIONS
2019/2020 ACADEMIC YEAR**

**SPECIAL/SUPPLEMENTARY EXAMINATIONS
SECOND YEAR SEMESTER TWO**

**FOR THE DEGREE OF
COMPUTER SCIENCE**

COURSE CODE: CSC 212/221

**COURSE TITLE: INTRODUCTION TO/
DATABASE SYSTEMS**

DATE: 01/02/2021

TIME: 08.00 A.M – 10.00 A.M

INSTRUCTIONS:

ANSWER QUESTIONS ONE AND ANY OTHER TWO

QUESTION ONE [COMPULSORY] [30 MARKS]

- a. Define the following terminologies as used in relational data model.
- i. Relation [1 mark]
 - ii. Attribute [1 mark]
 - iii. Domain [1 mark]
 - iv. Tuple [1 mark]
- b. Discuss the meaning of each of the following terms as used in databases.
- i. Data [1 mark]
 - ii. Database [1 mark]
 - iii. Database management system [1 mark]
 - iv. Application program [1 mark]
 - v. Data independence [1 mark]
- c. Describe the five components of the DBMS environment and discuss how they relate to each other. [5 marks]
- d. What are the two major components of SQL and what function do they serve? [4 marks]
- e. Using a well labeled diagram, describe the Three Level ANSI-SPARC Architecture. [6 marks]
- f. Compare and contrast the main tasks carried out by the DA and DBA. [6 marks]

QUESTION TWO [20 MARKS]

- a. Explain the function of each of the clauses in the SELECT statement. What restrictions are imposed on these clauses?
- i. FROM [1mark]
 - ii. WHERE [1 mark]
 - iii. GROUP BY [1 mark]
 - iv. HAVING [1 mark]

v. SELECT

[1 mark]

vi. ORDER BY

[1 mark]

b. Define the two principal integrity rules for the relational model. Discuss why it is desirable to enforce these rules.

[6 marks]

c. Describe the purpose of the data conversion and loading stage.

[8 marks]

QUESTION THREE [20 MARKS]

a. Discuss five limitation of the file based system.

[10 marks]

b. Describe two approaches to checking that a logical data model supports the transactions required by the user.

[10 marks]

QUESTION FOUR [20 MARKS]

a. Using a well labelled diagram, determine how a client- server environment works.

[5 marks]

b. What is a database schema? Identify and describe the three types of schema in the database.

[8 marks]

c. What is a data model? Explain the following types of Record-based data models

[3 marks]

i. Relational data model

[2 marks]

ii. Network data model

[2 marks]

iii. Hierarchical data model.

QUESTION FIVE [20 MARKS]

a. Describe the types of update anomalies that may occur on a table that has redundant data.

[6 marks]

b. Discuss how normalization may be used in database design.

[8 marks]

c. Describe what a superclass and a subclass represent.

[6 marks]