



KIBABII UNIVERSITY

**UNIVERSITY EXAMINATIONS
2020/2021 ACADEMIC YEAR**

**SPECIAL/ SUPPLEMENTARY EXAMINATIONS
YEAR THREE SEMESTER ONE EXAMINATIONS**

**FOR THE DEGREE IN
COMPUTER SCIENCE**

COURSE CODE : CSC 316
COURSE TITLE : DATABASE SYSTEMS II

DATE: 12/01/2022 TIME: 8.00 A.M – 10.00 A.M

INSTRUCTIONS TO CANDIDATES

ANSWER QUESTIONS ONE AND ANY OTHER TWO.

QUESTION ONE [COMPULSORY][30 MARKS]

- i. Using examples explain three key advantages of normalization [3 Marks]
- ii. Explain the role of a data dictionary in a database management system [4 Marks]
- iii. Briefly explain the three of phases of database design [6 Marks]
- iv. Draw an ER diagram for the following. Be sure to indicate the existence and cardinality for each relationship. [5 Marks]

A college runs many classes. Each class may be taught by several teachers, and a teacher may teach several classes. A particular class always uses the same room. Because classes may meet at different times or on different evenings, it is possible for different classes to use the same room.

v. Study the tables below and answer the questions that follow:

Lecturer Table

LecturerID	Name	Department	Gender	Date of Birth	Salary Band
T005	John Williams	ICT	Male	07/07/1960	A
T101	Andrew Mathews	SC	Male	02/08/1968	A
T411	Nancy Johson	SC	Female	12/12/1975	B
T001	Rozey Robinson	IT	Female	19/09/1970	B

Unit table

UnitNo	Title	LecturerID
UN002	Java Programmin	T005
UN005	Multimedia	T001
UN011	Website design	T001
UN007	Introduction to Chemistry	T411

Departmental table

Departmental Code	Name
ICT	Information, communication & Technology
ML	Modern Language
SC	Sciences

- i. Draw an Entity-Relationship Diagram (ERD) for the three logical tables above. [3 Marks]

- ii. Using the above logical tables, write the following SQL statement:
- CREATE TABLE statement for the Lecturer table. [2 Marks]
 - List the names of Lecturers in alphabetical order and their department names. [2 Marks]
 - List the Unit titles and Lecturer names by department name. [3Marks]
- iii. Explain why the word ' DISTINCT' may be included in an SQL statement, such as
SELECT DISTINCT Name. [2 Marks]

QUESTION TWO [20 MARKS]

A foundation dealing with regulation of publication of books maintains a database consisting of 3 related tables whose structure is as shown below:

Book(bookCode, bookTitle, authorCode, pubCode dateOfPub)

Author(authorCode, authorName, authorCountry, authorContacts)

Publisher(pubCode, pubName, pubCountry, pubContacts)

Write down an SQL state to:

- Create the Author and Book table [2 Marks]
- Change the contacts of the publisher whose code in pub12, to 12299 [2 Marks]
- Insert a record into the authors table (use appropriate values [2 Marks]
- List the total number books [2 Marks]
- Display the titles of all books authored by Joseph Paul, [2 Marks]
- Display the name of the author of the book Database Management, [2 Marks]
- Display the titles of all books as well as the names of their authors and the names of their authors. Ensure that books of the same author are listed together in a group. [2 Marks]
- List the names of the publishers who have published books authored by CJ Date, [2 Marks]

Discuss three dependencies' used during normalization [6 Marks]

QUESTION THREE [20 MARKS]

- Briefly describe the key features of a relational database [10 Marks]
- Discuss the maintenance problems associated with unnormalized tables [6 Marks]
- Distinguish between a weak entity and a strong entity set. [4 Marks]

QUESTION FOUR [20 MARKS]

- With relevant explanations normalize the given bookshop order form to third normal form [10 Marks]
- Using examples explain the three broad categories of structured query language [6 Marks]
- Explain why we use triggers are used in databases [4 Marks]

QUESTION FIVE [20 MARKS]

- Your organization currently does not run any database. The management would like you to understand what a database is all about. Explain the database system lifecycle they should prepare to embrace if they wish to have a database for their operations. [12marks]
- Discuss normalization. Show why it is important in database design and demonstrate how it is done. Include UNF, 1NF, 2NF and 3NF. [8 Marks]