



Knowledge for Development

KIBABII UNIVERSITY

**UNIVERSITY EXAMINATIONS
2019/2020 ACADEMIC YEAR**

**END OF SEMESTER EXAMINATIONS
YEAR TWO SEMESTER TWO**

**FOR THE DEGREE OF
COMPUTER SCIENCE**

COURSE CODE : CSC 221

COURSE TITLE : DATABASE SYSTEMS I

DATE: 12/11/2020

TIME: 2.00 P.M – 4.00 P.M

INSTRUCTIONS:

ANSWER QUESTIONS ONE AND ANY OTHER TWO

QUESTION ONE [COMPULSORY] [30 MARKS]

- a) Differentiate between physical and logical view as applied in database. [2 marks]
- b) Describe the following properties of a database.
- i. Data integration [2 marks]
 - ii. Data abstraction [2 marks]
 - iii. Data independence [2 marks]
 - iv. Data security [2 marks]
- c) Identify and describe FOUR key functions that a Database Management System (DBMS) must support. [8 marks]
- d) Discuss the following database models.
- i. Hierarchical database model [2 marks]
 - ii. Network database model [2 marks]
- e) Given the three tables below that represents student, course and course registration details:
- Students (RegNo, Surname, Othernames, Email)
- Courses (Code, Title)
- Registration (RegNo, Code, Date)
- f) Write the SQL statements that
- i. Creates tables registration including foreign keys [2 marks]
 - ii. Lists students registered for the course CSC 221 [2 marks]
 - iii. Lists students who have not registered for any course unit [2 Marks]

QUESTION TWO [20 MARKS]

- a) Giving examples, define an RDBMS [2 marks]
- b) Explain the two types of program-data independence on the basis of the three levels ANSI/SPARC architecture of a database. [4 marks]
- c) Briefly describe the three levels of a database schema. [6 marks]

d) Briefly explain the four broad categories of SQL commands giving two examples of SQL statements used in each category. [8 marks]

QUESTION THREE [20 MARKS]

a) What are the potential costs of implementing a database system? [4 marks]

b) Explain 2 problems that redundancy creates and how it can be reduced in a relational database management system. [4 marks]

c) The table below shows details of products in an inventory system

Prodnum	Prodname	Quantity	Unit_Price	Supplier_Name	Supply_Date
3245	Processing unit	40	25000	ABC computers	8/09/10
7643	Monitor	60	12000	ABC computers	7/10/10
2190	Keyboard	200	600	Umoja solution	12/10/10
4372	Mouse	400	300	IT comm..	3/09/10
8733	Hard disk	60	2400	IT comm..	16/10/10
6754	Modem	120	1500	ABC computers	5/09/10

i. Write an expression that will extract records that satisfy the following conditions using SQL query statements. [2 marks]

ii. List all products details starting with letter M. [2 marks]

iii. List all products prodnum, prodname columns of all products with unit price 25000,2400, 600 and 1500 [2 marks]

iv. Group all records by supplier name [2 marks]

d) Give two advantages and disadvantages of the database management systems over the file processing systems [4 marks]

QUESTION FOUR [20 MARKS]

a) Name and explain three types of queries. [6 marks]

b) Define the term database models. [2 marks]

c) Discuss any four types of database models used today, use diagrams where necessary.

[8 marks]

d) State four differences between forms and reports.

[4 marks]

QUESTION FIVE [20 MARKS]

a) Describe two advantages of the database approach over the file-system approach.

[4 marks]

b) With respect to information management, compare the following concepts;

i. Instance and schema

[1 mark]

ii. Tuple and attribute

[1 mark]

iii. File system and DBMS

[1 mark]

c) Discuss the key features of a relational model

[5 marks]

d) Using examples, briefly explain the components of a database system

[8 marks]