KIRIRI WOMEN'S UNIVERSITY OF SCIENCE AND TECHNOLOGY
UNIVERSITY EXAMINATION, 2023/2024 ACADEMIC YEAR
SECOND YEAR, SECOND SEMESTER EXAMINATION
FOR THE BACHELOR OF SCIENCE IN COMPUTER SCIENCE
KCS 207 – INTRODUCTION TO DATABASE SYSTEMS

Date: 15TH AUGUST 2023
Time: 2:30AM – 4:30PM

INSTRUCTIONS TO CANDIDATES
ANSWER QUESTION ONE (COMPULSORY) AND ANY OTHER TWO QUESTIONS
QUESTION ONE (30 MARKS)

a)   Define each of the following terms as used in database.
   i)   Database management   (2 Marks)
   ii)   Secondary key   (2 Marks)
   iii)   Primary key   (2 Marks)
   iv)   Foreign key   (2 Marks)
   v)   Atomicity   (2 Marks)
b)   Database management systems provide several functions in addition to simple file management.
   State five of them.   (4 Marks)
c)   Briefly outline how the following individuals interact with the database management system: -
   i)   System network Administrator   (2 Marks)
   ii)   Database designer   (2 Marks)
   iii)   Database administrator   (2 Marks)
d)   I. Define the term normalization as used in databases.   (2 Marks)
   II. Give two reasons why normalizations needed in databases.   (2 Marks)
e)   Differentiate between naïve and supplicated users as applied in databases.   (4 Marks)
f)   Write an SQL statement to: -
   Extract name and position of employees whose salary is more than Ksh. 15,000
   NOTE: Table name is employees   (2 Marks)

QUESTION TWO (20 MARKS)
a)   Normalization rules are divided into at least four normal forms. State the first, second and third
   normal form roles.   (6 Marks)
b)   With aid of a diagram in each case, distinguish between a hierarchical and relational database
   models.   (6 Marks)
c)   Explain the function of the following statements used in SQL: -
   i)   Drop   (2 Marks)
   ii)   Commit   (2 Marks)
   iii)   Create   (2 Marks)
   iv)   Select   (2 Marks)

QUESTION THREE (20 MARKS)

a) State and explain three elements of a database management system. (6 Marks)

b) Highlight five functions of a database administrator. (5 Marks)

c) Explain four recovery mechanism provided by database management system. (4 Marks)

d) A database designer wants to create a structure for storing student's details with the following fields:

Admno, Name, Dept, Fees

Write an SQL statement that will:-

i) Create a table named student (2 Marks)

ii) Insert the following records to the table:- (3 Marks)

Admo: 427

Name: Keith

Fees: 42000

Dept: Computer

QUESTION FOUR (20 MARKS)

a) SQL defines data languages to manipulate data of DBMS. State and explain five of such data languages giving an example of a command in each case. (10 Marks)

b) State and explain three types of relationship in database management systems. (6 Marks)

c) Write a SQL query to select all records from table Staff. (4 Marks)

QUESTION FIVE (20 MARKS)

a) Describe any three types of indexes. (3 Marks)

b) Explain what is meant by a transaction. Why are transactions important units of operation in a DBMS (3 Marks)

c) The consistency and reliability aspects of transactions are due to the 'ACIDity' properties of transactions. Discuss each of these properties and how they relate to the concurrency control and recovery mechanisms. Give examples to illustrate your answer. (8 Marks)

d) Compare and contrast between Relational algebra and SQL. (6 Marks)