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KIRIRI WOMEN'S UNIVERSITY OF SCIENCE AND TECHNOLOGY
UNIVERSITY EXAMINATION, 2023/2024 ACADEMIC YEAR
END SEMESTER EXAMINATION
FOR THE BACHELOR OF SCIENCE IN COMPUTER SCIENCE
KCS 404 – ADVANCED DATABASE SYSTEMS
SPECIAL

Date: 16TH AUGUST 2023
Time: 8:30AM – 10:30AM

INSTRUCTIONS TO CANDIDATES

ANSWER QUESTION ONE (COMPULSORY) AND ANY OTHER TWO QUESTIONS

QUESTION ONE (30 MARKS)

- Define what a Database System is and describe its components. (5 Marks)
- Explain five types of data models available in the field of database modeling. (10 Marks)
- SQL offers six categories of data types for your use. Describe these categories. (6 Marks)
- Describe the 4 major characteristics of the database approach. (4 Marks)
- Write the SQL code that will create a table called: EMPLOYEE which contains the following columns: EMP_ID, NAME, AGE, HIRE_DATE, SALARY, DEPARTMENT (5 Marks)

QUESTION TWO (20 MARKS)

- Define concurrency control and explain the three main problems that concurrency control seeks to resolve. (4 Marks)
- Discuss the three broad categories of the methods proposed to schedule the execution of conflicting operations in concurrent transactions. (6 Marks)
- Define what a DBMS is and describe its functions. (10 Marks)

QUESTION THREE (20 MARKS)

- Define Normalization and describe the first 3 normal forms. (6 Marks)
- Describe four advantages of using a DBMS (4 Marks)
- Explain using a relevant diagram the three-schema architecture. (10 Marks)

QUESTION FOUR (20 MARKS)

- Using a relevant diagram explain the Database Life Cycle in relation to database design. (10 Marks)
- Define transaction in relation to database systems and describe four major properties each individual transaction must display. (5 Marks)
- Define database recovery and explain two techniques that a DBA can use during the database recovery process. (5 Marks)

QUESTION FIVE (20 MARKS)

- Write the SQL code that will create a table called: STUDENT which contains the following columns: STUD_ID, FIRSTNAME, LASTNAME, BIRTH_DATE, FEE, COURSE_ID (10 Marks)

- b) Describe the concept of normalization and demonstrate the concept using an example table. (10 Marks)