061006T4ICT
ICT TECHNICIAN LEVEL 6
IT/OS/ICT/CR/7/6
MANAGE DATABASE SYSTEMS
Mar. /Apr. 2023
Time: 3 Hours

THE KENYA NATIONAL EXAMINATIONS COUNCIL

WRITTEN ASSESSMENT

3 Hours

INSTRUCTIONS TO CANDIDATE:

Maximum marks for each question are indicated in ().

*This paper consists of **TWO** sections: **A** and **B**.*

*Answer **ALL** questions in section **A** and **THREE** questions from section **B** in the answer booklet provided.*

Candidate should answer questions in English.

This paper consists of 3 printed pages

Candidates should check the question paper to ascertain that all pages are printed as indicated and that no questions are missing.

SECTION A (40 Marks)

*Answe**r ALL** questions in this section**.***

1. Define each of the following terms:
   i. Entity; (2 Marks)
   ii. Entity type; (2 Marks)
   iii. Entity set. (2 Marks)
2. State the **three** levels of data abstraction in Database Management Systems. (3 Marks)
3. Describe **three** keys that can be used in database. (6 Marks)
4. Explain **two** types of Data Independence in databases. (4 Marks)
5. Explain the term data testing as used in a database. (2 Marks)
6. Explain **two** reasons for performing database testing. (3 Marks)
7. Mary developed a database for a company. Outline the **four** key stages she could have followed when testing this database. (4 Marks)
8. Mike designed a database using an Entity Relationship Diagram (ERD). Using symbols, describe **three** connotations of ERD he could use. (6 Marks)
9. There are four most basic operations in database which are the backbone for interacting with database. State **two** of these database operations. (2 Marks)
10. With the aid of an example in each case, describe **three** components of a database system. (4 Marks)

SECTION B (60 MARKS)

*Answer any **THREE** questions from this section.*

11. a) Define the term database. (2 Marks)

    b) Differentiate between *field* and *record* as used in databases. (2 Marks)

    c) Explain the following as used in relational database model: (10 Marks)

    i) Table;

    ii) Tuple;

    iii) Attributes;

    iv) Relation schema;

    v) Domain.

    d) Explain the **three** types of relationships in databases. (6 Marks)

12. a) Explain **six** characteristics of Database Management System. (12 Marks)

    b) A company has installed a database system for its operations. Explain **four** benefits accrued from its use. (8 Marks)

13. a) Data Definition Language is used to bring objects into existence. Discuss **five** database objects. (10 Marks)

    b) Discuss **five** types of database security. (10 Marks)

14. a) Highlight **four** factors considered when choosing the type of database software to adopt. (4 Marks)

    b) The ACID properties of data transactions provide a mechanism to ensure the correctness and consistency of data in a database. Explain each of these **four** properties. (8 Marks)

    c) Databases are designed based on various data models. Discuss **four** database models. (8 Marks)

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