061005T4ICT

ICT TECHNICIAN LEVEL 5

ICT/OS/IT/CR/04/5

MANAGE DATABASE SYSTEM

NOV/DEC 2023

TVET CURRICULUM DEVELOPMENT, ASSESSMENT AND CERTIFICATION COUNCIL

(TVET CDACC)

WRITTEN ASSESSMENT

Time: 3 Hours

INSTRUCTIONS TO CANDIDATE

1. This paper has THREE sections A, B and C. Attempt questions in each section as per instructions given in the section.

2. You are provided with a separate answer booklet.

3. Marks for each question are indicated in the brackets.

4. Do not write on the question paper

This paper consists of 9 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: 20 MARKS

Attempt ALL questions in this section.

1. Which type of database model organizes data into tables with rows and columns?

    A. Hierarchical

    B. Relational

    C. NoSQL

    D. Graph

2. _____ is a set of one or more attributes taken collectively to uniquely identify a record.

    A. Primary Key

    B. Foreign Key

    C. Supper Key

    D. Candidate Key

3. What is a table in a database?

    A. A Visual representation of the database structure

    B. A Collection of related records organized in rows and columns

    C. A backup copy of the entire database

    D. A query is used to retrieve data.

4. Select the relationship that exists between two tables in a relational database when a record in the 1st table can be related to many records in the 2nd table, but each record in the 2nd table is related to only one record in the 1st table.

    A. One-to-one

    B. one-to-many

    C. many-to-one

    D. many-to-many

5. When creating a new table, what is the purpose of the PRIMARY KEY constraint?

    A. It specifies the table's name

    B. It enforces unique values in a specific column and identifies a record

    C. It sets a default value for all records

    D. It defines a foreign key relationship

6. What type of data can be stored in the database?

    A. Image oriented data

    B. Text, Files containing data

    C. Data in the form of audio or video

    D. All the above

7. What is the primary goal of database testing?

    A. To test the user interface of a database application

    B. To ensure data consistency, accuracy, and reliability in a database

    C. To evaluate the network speed of a database server

    D. To validate the database design only

8. Which of the following is not a common method for testing the performance of a database?

    A. Load testing

    B. Stress Testing

    C. Usability testing

    D. Scalability testing

9. Mary is to retrieve data from the student's database. What SQL statement can she use to get her results?

    A. SELECT

    B. PRINT

    C. DISPLAY

    D. OUTPUT

10. In a relationship database management system, what is the purpose of the "DESC" command?

    A. To describe how to delete a database object

    B. To describe the structure of a table or database object

    C. To insert data into a table

    D. To modify the schema of a table

11. Choose the term that describes the smallest unit of data in a relational database.

    A. Table

    B. Record

    C. Field

    D. Database Schema

12. When setting up a database you are required to define the data types for column. What is the primary purpose for doing so?

    A. To limit the amount of data that can be stored in a column

    B. To specify how data is stored and interpreted

    C. To define the primary key of a table

    D. To create a relationship between tables

13. In a NoSQL database model, which type is designed for high-speed data retrieval and querying?

    A. document-oriented

    B. Key-value

    C. Column-family

    D. Graphical

14. Which component of a DBMS is responsible for interpreting and executing SQL queries?

    A. Query optimizer

    B. Database Engine

    C. Data dictionary

    D. Query Designer

15. What does the term "SQL' stand for in the context of database management?

    A. Structured Query Language

    B. Sequential Query Logic

    C. Secure Query Layer

    D. System Query Link

16. Select the primary purpose of a "VIEW" in a database.

    A. To store data in a structured format

    B. To generate reports of business analysis

    C. To provide a virtual table based on the results of an SQL query

    D. To create backup copies of the database

17. ICT students were given the four processes below during their database system lessons. Choose which one is not the utility of DBMS.

    i) Backup ii) loading iii) Process organization iv) File organization

    A. i, ii, and iv only

    B. i, ii, and iii only

C. i, iii, and iv only

D. All (i, ii, iii, and iv)

18. The relationship between _____ is called parent-child relationship.

   A. Forms

   B. Record type

   C. Filtered type

   D. Data type.

19. Queries are special views of data in a _____

   A. Table

   B. Record

   C. Forms

   D. Report

20. Shown below are the data processing steps. Select the odd one out.

   A. Validation

   B. Collection

   C. Verification

   D. Computation

SECTION B: 40 MARKS

Attempt ALL questions in this section

21.

a) What is a database? (2 Marks)

b) Database Management Systems (DBMS) carry out several crucial tasks. Enumerate its FOUR purposes. (4 Marks)

22. Effective data management and retrieval are supported by several indexing-related database architectural benefits. Identify the FOUR benefits of indexing about database design. (4 Marks)

23. Define the following terms as used in the database management system.

a) foreign key (2 Marks)

b) Table (2 Marks)

c) Reports (2 Marks)

24.

a) One method that is frequently applied in the realm of database architecture is entity-relationship (ER) modeling technique. Describe this technique (2 Marks)

b) Database relationships are an essential aspect of Entity-Relationship Diagrams (ERDs). Explain how they are represented in an ERD. (2 Marks)

25.

a) Define the term normalization in the context of a database. (2 Marks)

b) Normalization provides numerous major benefits in database architecture that help overall data management and system performance. List THREE of its advantages. (3 Marks)

26.

a) Database testing is an important aspect of software testing that ensures the data in a database is correct, accessible and secure. What is database testing? (2 Marks)

b) Prisca is in charge of the team deployed by XYZ Enterprises to do database testing at their new Nairobi branch. Make a list of THREE common tools they might employ. (3 Marks)

c) Shikoto is tasked with creating a stock and staff database for Marinda Supermarket. Describe FIVE practices he should employ to ensure the database is organized and presentable before printing. (5 Marks)

27.

   a) Depending on the database management system you are using, many data types may be employed to produce distinct table columns in a database. List the THREE data types that are frequently utilized. (3 Marks)

   b) When designing table columns in a database management system, why is the CHECK constraint used? (2 Marks)

SECTION C: 40 MARKS

Attempt any TWO questions in this section

29. a). A Television company wishes to develop a database to store data about the TV series that the company produces. The data includes information about actors and directors. The Actors and directors are employed by the company. A TV series is divided into episodes. Each episode may be transmitted on several occasions. An actor is hired to participate in a series but may participate in many series.

    i.   Identify FOUR entities in the above scenario. (4 Marks)

    ii.   Which column would you use to define the primary key between the actor's table being the 1st table and the TV series table being the second table? (2 Marks)

b). Database systems have several benefits that make them vital in contemporary data management. Discuss FOUR of these benefits. (8 Marks)

c). Explain the data design principles and how they apply to database management systems.

(6 Marks)

30. Study the below database table that stores students records and answer the questions that follow:

TABLE: STUDENTS

Student ID	| First Name	Last Name	Birth date
1001	Jane	Smith	1999-08-20
1002	John	Doe	1998-05-15
1003	Alice	James	2000-02-10
1004	Bobby	Brown	197-11-30

a) Write SQL statements to perform the following

    i) Update the birthdate of the student with Student ID 1001 to '1995-03-20' (2 Marks)

    ii) Count the number of students in the "Student" table (2 Marks)

    iii) List the Student IDs and full names of all students (2 Marks)

    iv) Add a new student with Student ID 1005 to the table (2 Marks)

    v) Find the number of students born in or after the year 2000 (2 Marks)

b) Numerous data types in a relational database may be used to define the structure of columns in tables. Determine the FOUR types available to you. (4 Marks)

c) Define the term data integration in the context of databases and discuss TWO of its benefits.

(6 Marks)

31.

a) Database systems employ a variety of data model, each with a distinct function and a requirement that is met by a different organization. Describe FIVE possible model kinds. (10 Marks)

b) Define the below terms as used in database systems.

   i.   Relationship   (2 Marks)

   ii. Entity   (2 Marks)

   iii. Query   (2 Marks)

c) Mary was requested to link the student's details in a table named students to the Marks gotten after exams from a table called Marks. Write a query she can use to link the two tables using student ID as the primary key. (4 Marks)

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