THE STATE UNIVERSITY OF ZANZIBAR

SCHOOL OF COMPUTING COMMUNICATION AND MEDIA STUDIES

DEPARTMENT OF COMPUTER SCIENCE AND INFORMATION TECHNOLOGY

FINAL EXAMINATION

SEMESTER I

INF 2112: DATABASE APPLICATION I (MS SQL SERVER)

Date: 26ᵗʰ February, 2024   **Time: 02:00 PM – 05:00 PM**

INSTRUCTIONS

1. This paper consists of **TWO** sections, **A** and **B**, which carries 24 and 36 marks respectively.

2. Answer all questions from section A, and any THREE questions from section B.

3. Cellular phones and any other unauthorized materials are NOT allowed in the examination room.

4. **ANSWER EACH QUESTION ON SEPERATE SHEET**

5. This exam consists of six (6) printed pages, including cover page.

Answer all questions

1. Multiple Choice Question: Choose the most correct answer [each question carrues 1 mark]

    i.How many data types and categories are available in T-SQL?
- A. 8
- B. 9
- C. 4
- D. 7

    ii.Management Studio is _____ used for development of SQL Server database.
- A. Front end tool
- B. Back end tool
- C. Database engine
- D. SQL Server

    iii.What will be the output of the below LIKE query?
WHERE SALARY LIKE '9000%'
- A. It will find any value that starts with 9000
- B. It will find any value that ends with 9000
- C. It will find any value whose range is between 9000
- D. It will find the value where salary is less than 9000

iv.   Which of the following Statements are True with regards to Categories of T-SQL?
- A. DML statements are focused only on Managing security and Permissions such as GRANT, REVOKE and DENY.
- B. DCL statements handles lifecycle of database objects such as tables, views and procedures.
- C. DDL statements include CREATE, ALTER, AND DROP
- D. None of the Above

    v.Which of the following statement is true?
- A. Views could be looked as an additional layer on the table which enables us to protect intricate or sensitive data based upon our needs
- B. Views are virtual tables that are compiled at run time
- C. Creating views can improve query response time
- D. All of the Mentioned

vi. SQL Server includes 5 System Databases. Which one of the following is used only for Reporting Services?
- A. Master
- B. Model
- C. Msdb
- D. None of the above

vii. Choose the best answer that describes the correct Logical Query Processing Order.
- A. SELECT, ORDER BY, WHERE, GROUP BY, HAVING, FROM
- B. FROM, SELECT, WHERE, GROUP BY, HAVING, ORDER BY.
- C. FROM, WHERE, GROUP BY, HAVING, SELECT, ORDER BY.
- D. FROM, WHERE, GROUP BY, SELECT, HAVING, ORDER BY.

viii. What is the meaning of LIKE '%0%0%'?
- A. Feature begins with two 0's
- B. Feature ends with two 0's
- C. Feature has more than two 0's
- D. Feature has two 0's in it, at any position

2.
a. What do you understand by the following terms? [3 mark

    i.   CMD Parser

    ii.   SQL Server Agent

    iii.   SQL Server Browser

b. Mention any four advantages of instances. [4 mark

c. Explain the three components that are available on the protocol layer in SQL server architecture. [3 mark

3.
a. What are the three types of Client Server Architecture supported in the Protocol Layer in the SQL Server? [3 mark

b. Briefly explain the SQL Server storage Engine Architecture by pointing out the operating system files of any SQL Server Database. [3 mark

4.
a. Briefly explain the following terminologies: [3 mark

i. Database Engine

ii. SQL Server

iii. SQL Server Agent

b. List out four advantages of having more than one SQL Server instance running on a single machine. [4 mark

c. Briefly explain the two most important SQL Server database files. [4 mark

3

5.
   a. Use T-SQL to create a database called Students, and the tables studentinfo with   [3 mark
      fields (StudentID which is PRIMARY KEY, FirstName, LastName,
      DateOfBirth and Gender) and Results with the fields (CourseCode which is
      PRIMARY KEY, StudentID, CourseName, Marks and Grade).
      Remember to include relationships if any.

   b. Verify that all tables above have been successfully created.   [2 mark

   c. Create a VIEW **student_view** which displays StudentID, name and subject,   [3 mark
      name and grade.

   d. Assume you have Sales.LineItem table which includes the following columns: [4 mar

        ProductID (integer)

        Quantity (integer)

        Price (decimal)

      The Price column contains decimal numeric values, for example 14.79. Write a query that returns each ProductID and a column named Subtotal, in which the values for Quantity and Price are multiplied together.

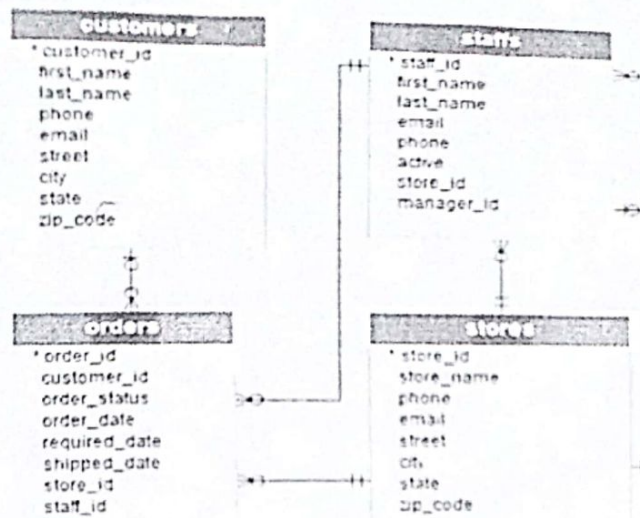6.   Consider the structure of the Customer table below:
   Student(id, student_name, city_id, address, telephone)

   a. Briefly explain any four (4) advantages of using stored procedures.   [4 mar

   b. Create a stored procedure called **spStudents** that list all students which satisfies   [3 mark
      the given input parameters. The input parameters are student_ name, city and
      telephone.

   c. Write a statement to execute the stored procedure in question (5b).   [2 mark

   d. With examples, brielfly explain the use of the following system stored procedures.   [3 marks
       i.   sp_help
       ii. sp_helptext
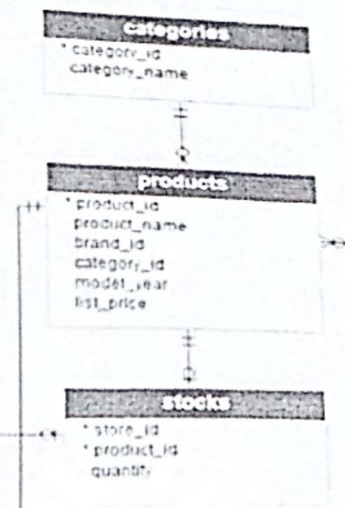   iii. sp_depends

6. Refer to the following diagram.

Sales / Production ER diagram showing tables: customers (customer_id, first_name, last_name, phone, email, street, city, state, zip_code), staffs (staff_id, first_name, last_name, email, phone, active, store_id, manager_id), orders (order_id, customer_id, order_status, order_date, required_date, shipped_date, store_id, staff_id), stores (store_id, store_name, phone, email, street, city, state, zip_code), categories (category_id, category_name), products (product_id, product_name, brand_id, category_id, model_year, list_price), stocks (store_id, product_id, quantity).

a. Create an INSERT TRIGGER **tr_Insert_Customer** on table customers that stores **[6 marks]** the information of the customer, the time that the customer is inserted into the database and the **user** who has performed the insert operation.
   Hint: Whenever an insert operation occurs on the customer table, data is inserted into another table, **customerLogin.**

b. Create the customerLogin table to fit in the above question. **[2 marks**

c. Briefly explain why we should use triggers. **[4 marks**

7.

a. Briefly explain any four types of SQL Server Backups. **[2 marks**

b. With the help of T-SQL queries briefly explain how you can backup and restore **[4 marks** the Master Database

c. Discuss the importance of backing up a database. **[2 marks**

d. Explain a scenario where you can implement a SQL Server differential backup. **[2 marks**

e. What important thing to take into consideration when performing a backup for a **[2 marks** database?

९. a. Explain the process of creating a new user account in a relational database. Include the necessary SQL statements and considerations for setting passwords and default privileges. [3 marks

b. Differentiate between the concepts of privileges and roles in a database security context. Provide examples of scenarios where you might grant specific privileges directly to a user and where you might use roles. [3 mar]

c. Write a SQL statement to grant SELECT and UPDATE privileges on a specific table ("Employee") to a user account ("HR_User"). Explain the purpose of each privilege in this context. [2 mar]

d. Create a role named "Manager" and grant it the privileges to SELECT and DELETE records from the "Projects" table. Demonstrate how to assign this role to a user account named "ProjectManager." [4 ma]