NAMIBIA UNIVERSITY
OF SCIENCE AND TECHNOLOGY

FACULTY OF COMPUTING AND INFORMATICS
SCHOOL OF COMPUTING

DEPARTMENT OF SOFTWARE ENGINEERING

QUALIFICATIONS: BACHELOR OF COMPUTER SCIENCE; BACHELOR OF INFORMATICS; BACHELOR OF GEOINFORMATION TECHNOLOGY	
QUALIFICATION CODES: 07BCMS; 07BACS 07BAIT; 07BAIF; 07GITB	LEVEL: 6
COURSE CODE: DPG621S	COURSE NAME: DATABASE PROGRAMMING
SESSION: JANUARY 2024	PAPER: (PAPER 1)
DURATION: 3 HOURS	MARKS: 100

SECOND OPPORTUNITY/SUPPLEMENTARY EXAMINATION QUESTION PAPER	
EXAMINER:	DR GEREON KOCH KAPUIRE
MODERATOR:	MS ROSETHA KAYS

INSTRUCTIONS
1. Answer ALL the questions.
2. Read all the questions carefully before answering.
3. Number the answers clearly

THIS QUESTION PAPER CONSISTS OF 5 PAGES (Including this front page)

Section A – Theory (40 Marks)

Question 1
Choose True or False [10 Marks]

No	Questions	True (T)	False (F)
1	The IF statement in SQL Server can be used to control the flow of execution within a batch or stored procedure.		
2	A stored procedure in SQL Server can return multiple result sets.		
3	A stored procedure can have both input and output parameters.		
4	A stored procedure can be used to encapsulate a series of SQL statements to perform a specific task.		
5	Triggers in SQL Server can be defined to execute automatically in response to specific events, such as INSERT, UPDATE, or DELETE statements.		
6	The parameters in a SQL Server stored procedure must be of the same data type as the columns they reference in the database.		
7	SQL Server supports a TRY...GRAP block for structured exception handling.		
8	The ERROR statement in SQL Server is used to explicitly raise an exception.		
9	The FETCH statement in SQL Server is used to retrieve the next row from the result set of a cursor.		
10	The DECLARE CURSOR statement in SQL Server is used to define the characteristics of a cursor.		

Question 2 [5 Marks]
Compare Input and Output parameters in stored procedures. Provide an example for each.

Question 3 [4 Marks]
Compare the usage of stored procedures and triggers in SQL Server. When would you prefer one over the other?

Question 4 [4 Marks]
Compare FOR INSERT, FOR UPDATE, and FOR DELETE triggers in SQL Server. When would you use each type?

Question 5 [4 Marks]
Compare local variables and parameters in terms of scope and usage within stored procedures.

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Question 6 [4 Marks]
Compare the use of a cursor and a regular SELECT statement for iterating over a result set.

Question 7 [4 Marks]
Compare the FETCH NEXT statement and the OPEN statement in the context of cursors.

Question 8 [5 Marks]
Compare implicit and explicit transactions in SQL Server.

Section B – Practical (60 Marks)

(NOTE: Use SQL Server Management System (SSMS) on your computer for this section)

Instructions: Copy and Paste your final code onto notepad and save it on the exam drive (z). The drive is the drive with your student number.

Question 1 [4 Marks]

Scenario 1: Basic Parameterized Stored Procedure

```
CREATE TABLE Employees (
    EmployeeID INT PRIMARY KEY,
    FirstName VARCHAR(50),
    LastName VARCHAR(50),
    Salary INT,
    JobTitle VARCHAR(50)
);
INSERT INTO Employees (EmployeeID, FirstName, LastName, Salary, JobTitle)
VALUES
    (1, 'John', 'Doe', 50000, 'Engineer'),
    (2, 'Jane', 'Smith', 60000, 'Manager'),
    (3, 'Bob', 'Johnson', 75000, 'Developer');
```
Please create a stored procedure that utilizes the "Employees" table, along with the provided sample values, to retrieve employees whose salary exceeds a specified amount.

Question 2 [5 Marks]

Scenario 2: Using IF Statement in Stored Procedure
Modify the stored procedure created in Question 1 to include a condition that filters employees with a specific job title.

Question 3 [2 Marks]

Scenario 3: Handling Default Parameter Values

Modify the stored procedure from Question 2 to make the job title parameter optional, assigning it a default value.

Question 4 [2 Marks]

Write a statement to remove a stored procedure in SQL Server.

Question 5 [8 Marks]

Scenario 5: Data Retrieval with Filtering

```
CREATE TABLE Staff (
    StaffID INT PRIMARY KEY,
    FirstName VARCHAR(50),
    LastName VARCHAR(50),
    DepartmentID INT,
    Department VARCHAR(50),
    JobTitle NVARCHAR(50)
);
INSERT INTO Staff (StaffID, FirstName, LastName, DepartmentID, Department,
JobTitle)
VALUES
    (1, 'John', 'Doe', 1, 'HR', 'Manager'),
    (2, 'Jane', 'Smith', 2, 'IT', 'Developer'),
    (3, 'Bob', 'Johnson', 1, 'HR', 'Analyst');
```

To obtain employee information from a database, utilizing the staff table, you must create a stored procedure designed to retrieve data based on specified criteria like department and job title. How would you structure such a stored procedure?

Question 6 [4 Marks]

Scenario 6: Automated Data Cleanup

```
CREATE TABLE Student (
    StudentNo INT PRIMARY KEY,
    RegistrationDate DATE,
    -- Add other columns as needed
);
```

You want to automatically delete records older than a certain date from the table "Student". How would you design a stored procedure to perform this task?

Question 7 [10 Marks]

Scenario 7: Looping Through a Result Set

```
CREATE TABLE YourTable (
    ID INT PRIMARY KEY,
    YourColumn INT
);
INSERT INTO YourTable (ID, YourColumn)
VALUES
    (1, 10),
    (2, 20),
    (3, 30),
    (4, 40);
```

Using the "YourTable" table, create a stored procedure tasked with looping through a result set, executing a specified operation on each row. This could involve updating a column through a calculated process. Could you outline the steps for achieving this, with an

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emphasis on employing a cursor for handling this scenario?

Question 8   [10 Marks]

Scenario 8: Exception Handling
You are in the process of creating a stored procedure responsible for inserting data into the table mentioned in question 6. How do you plan to manage exceptions to guarantee data integrity? Additionally, demonstrate on your approach to incorporating transactions.

Question 9   [10 Marks]

Scenario 9: Nested IF Statements

How might you employ nested IF statements to categorize employees into various salary ranges? Develop a procedure using the table illustrated in Question 1 to accomplish this classification.

Question 10   [5 Marks]

Scenario 10: Basic Transaction
You have a stored procedure that needs to perform multiple updates, and you want to ensure that either all updates succeed or none of them do. How would you use a transaction to achieve this? Use the table indicated in Question 7.

<<<<<<End of Exam Paper>>>>>