



(University of Choice)

**MASINDE MULIRO UNIVERSITY OF
SCIENCE AND TECHNOLOGY
(MMUST)**

MAIN CAMPUS

**UNIVERSITY EXAMINATIONS
2021/2022 ACADEMIC YEAR
THIRD YEAR SECOND SEMESTER EXAMINATIONS
FOR THE DEGREE OF BACHELOR
OF
INFORMATION AND KNOWLEDGE MANAGEMENT**

COURSE CODE: BIT 327

COURSE TITLE: DATABASE PROGRAMMING

DATE: 01/08/2022

TIME: 2:00-4:00

INSTRUCTIONS TO CANDIDATES

**Question ONE (1) is compulsory
Attempt any TWO (2) questions**

TIME: 2 Hours

MMUST observes ZERO tolerance to examination cheating

This Paper Consists of 3 Printed Pages. Please Turn Over.

Question One [24 Marks]

a) Consider the SQL query

```
select p.a1  
from p, r1, r2  
where p.a1 = r1.a1 or p.a1 = r2.a1
```

Under what conditions does the preceding query select values of $p.a1$ that are either in $r1$ or in $r2$?
Examine carefully the cases where one of $r1$ or $r2$ may be empty. [4 Marks]

b) What are the different functions of SSMS and Database engine, what are their roles in Database System [6 Marks]

c) Given the relations below, answer the following questions

Employee(EmpId, Emp_Name, Address, CountyId)

County(CountyId, County_name)

i. Given that there are 47 counties in Kenya, add a **default Constraints** that will display a default value if county is unknown, with the CountyId assigned to 48 when the employee county is unknown. [6 Marks]

ii. What happens when insert commands the CountyId in Employee Null is passed? Explain your answer [4 Marks]

d) The SQL script below is to create and execute the parameter stored procedure.
What will be the returned when the stored procedure is executed? Explain your answer [4 Marks]

```
spGetEmployeeByGenderAndDepartment 1, 'Male'
```

```
Create procedure spGetEmployeeByGenderAndDepartment
```

```
@Gender nvarchar(20),
```

```
@DepartmentId int
```

```
as
```

```
Begin
```

```
Select Name, Gender, Department from employeetble where Gender = @Gender  
and DepartmentId= @DepartmentId
```

```
End
```

Question two [18 Marks]

a) Consider the relational database of below.

employee (employee-name, street, city)

works (employee-name, company-name, salary)

company (company-name, city)

manages (employee-name, manager-name)

i. Using SQL, define a view consisting of manager-name and the average salary of all employees who work for that manager. [7 Marks]

ii. Explain why the database system should not allow updates to be expressed in terms of this view.

[4 Marks]

b) Given the table employee with the following attributes

EmployeeTbl(EmpId, Emp_Name, Gender, Salary, contact, address, county)

Create a **after insert trigger** that should display the following in EmployeeAuditData table [6 Marks]

	EmpId	AuditData
1	1	New Employee with EmpId = 3 is added at May 12 2019 5:45pm

Question Three [18 Marks]

Given the table employee with the following attributes

EmployeeTbl(EmpId, Emp_Name, Gender, Salary)

Create a **after update trigger** that should display the following in EmployeeAuditData table [18 Marks]

EmpId	AuditData
4	Employee with EmpId = 4 changed Name from Matoke to Ndizi, salary from 199000 to 234000

Note: The After trigger for UPDATE event, makes use of both **inserted** and **deleted** tables. The **inserted** table contains the updated data and the **deleted** table contains the old data

Question Four [18 Marks]

Write an SQL query, without using a **with** clause, to find all branches where the total account deposit is less than the average total account deposit at all branches,

- i. Using a nested query in the **from** clouser.
- ii. Using a nested query in a **having** clause.

[10 Marks]
[8 Marks]

Question Five [18 Marks]

Consider the employee database below, where the primary keys are underlined. Give an expression in SQL for each of the following queries.

employee (employee-name, street, city)

works (employee-name, company-name, salary)

company (company-name, city)

manages (employee-name, manager-name)

- i. Find all employees in the database who live in the same cities as the companies for which they work. [5 Marks]
- ii. Find the company that has the most employees (Without using limit or orderby) [5 Marks]
- iii. Assume that the companies may be located in several cities. Find all companies located in every city in which Credit Bank Corporation is located. [8 Marks]