MACHAKOS UNIVERSITY

University Examinations for 2020/2021

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF COMPUTING AND INFORMATION TECHNOLOGY

SECOND YEAR FIRST SEMESTER EXAMINATION FOR

BACHELOR OF SCIENCE (INFORMATION TECHNOLOGY)

SIT250: DATABASE SYSTEMS

DATE: 11/8/2021   **TIME:2:00 – 4:00 PM**

INSTRUCTIONS: Answer Question ONE and any other TWO Questions

QUESTION ONE (COMPULSORY)(30 MARKS)

a)   Distinguish between a field and record as used in database systems   (4 marks)

b)   Explain two functions of DBMS   (4 marks)

c)   Explain the following database models:

    i)   Relational Model   (3 marks)

    ii)   Object oriented model   (3 marks)

d)   Explain the following phases of database development
    i)   Evaluation and Selection
    ii) Requirements Analysis
    iii) Implementation   (6 marks)

e)   Briefly describe three reasons for database normalization   (6 marks)

f)   Draw an entity relationship diagram for Machakos level five hospital that captures any
    four entities.   (4 marks)

QUESTION TWO (20 MARKS)

a)   The table below represents details of an entity to be modelled in a database. Use it to
    answer the questions that follow.

Order Date	Customer	Items
22/8/2021	Mark Okode	Computer, Printer, Pen

Normalize this table into:

    i)   First Normal Form   (4 marks)

    ii)   Second Normal Form   (3 marks)

    iii)   Third Normal Form   (3 marks)

b)   Explain three differences between Oracle DBMS and SQL database.   (6 marks)

c)   Distinguish between data definition language and data manipulation language as used in SQL.   (4 marks)

QUESTION THREE (20 MARKS)

a)   Database design is an important stage in development:

    i)   Discuss the process of designing a typical database.   (6 marks)

    ii) Explain three properties of a good database design.   (6 marks)

b)   James has been asked to create a relationship between two tables in MS-Access. Explain the process he is likely to follow to accomplish this task.   (4 marks)

 c)   State four categories of database users   (4 marks)

QUESTION FOUR (20 MARKS)

a)   Mark has been assigned the task of designing tables to be used in a given database. Explain three reasons why he would choose to use entity relationship model as opposed to other models.   (6 marks)

b)   Schema is a way of logically grouping database objects. Explain three types of database schema that can be used for this purpose.   (6 marks)

c)   Explain four components of a database system.   (8 marks)

QUESTION FIVE (20 MARKS)

a)   Explain the function of each of the clauses in the SELECT statement in SQL

    i)   From

    ii)   Where

    iii) Group By   (6 marks)

b)   Show, giving appropriate SQL commands, step by _step how you would go about the following tasks:

    i)   Create a database called MksU   (2 marks)

    ii)   Display all databases   (2 marks)

    iii) Select the database above and create a table called Staff with five fields. Include the appropriate data types, primary key and other attributes.   (6 marks)

    iv) Select all Female Lecturers in ICT department   (4 marks)