



MACHAKOS UNIVERSITY

University Examinations for 2019/2020 Academic Year

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF COMPUTING AND INFORMATION TECHNOLOGY

FIRST YEAR SECOND SEMESTER EXAMINATION FOR

BACHELOR OF SCIENCE (MATHEMATICS AND COMPUTER SCIENCE)

BACHELOR OF SCIENCE (APPLIED CHEMISTRY)

BACHELOR OF SCIENCE (APPLIED PHYSICS)

SIT 111: DATABASE SYSTEMS

DATE: 8/12/2020

TIME: 8:30 – 10:30 AM

INSTRUCTIONS

Answer question ONE and any other TWO questions.

QUESTION ONE (30 MARKS) [COMPULSORY]

- a) Distinguish between a database and database system (4 marks)
- b) Explain two functions of DBMS (4 marks)
- c) Give the difference between a DDL and DML with examples in each case (4 marks)
- d) Explain the following database concepts
 - i. Meta data
 - ii. People: (4 marks)
- e) Briefly describe three reasons for normalization (6 marks)
- f) Draw an object-oriented database model for Machakos level five hospital that captures three entities. (5 marks)
- g) State three database management systems that can be used to build and manage database systems. (3 marks)

QUESTION TWO (20 MARKS)

- a) Mark wants to design tables to be used in a given database. Explain the reasons why he would choose to use tables or the relational model as opposed to other models. (10 marks)
- b) Schema is a way of logically grouping database objects. Explain five types of database schema that can be used for this purpose. (10 marks)

QUESTION THREE (20 MARKS)

- a) Describe the five components of the DBMS environment and discuss how they relate to each other. (10 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) Erick, a database administrator is supposed to protect the database from various threats. Discuss three database threats he is likely to deal with. (6 marks)

QUESTION FOUR (20 MARKS)

- a) Normalization is a technique that is used to organize tables so as to reduce data redundancy. Briefly discuss the process of normalization from first up to the third normal forms. (10 marks)
- b) Explain five reasons why most organizations deploy electronic database systems as opposed to traditional file systems. (10 marks)

QUESTION FIVE (20 MARKS)

- a) Explain the functions of the two major components of SQL. (4 marks)
- b) Explain the function of each of the clauses in the SELECT statement. What restrictions are imposed on these clauses?
 - i. From
 - ii. Where
 - iii. Group By (6 marks)
- c) Show, giving appropriate SQL commands, step by _step how you would go about the following tasks:
 - i. Create a database called Macha Uni. (2 marks)
 - ii. Select the database above and create a table called Staff with five fields. Include the appropriate data types, primary key and other attributes. (4 marks)
 - iii. Select all Female Lecturers in ICT department (4 marks)