



MACHAKOS UNIVERSITY

University Examinations for 2018/2019

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF COMPUTING AND INFORMATION TECHNOLOGY

FIRST YEAR SECOND SEMESTER EXAMINATION FOR

BACHELOR OF SCIENCE (APPLIED PHYSICS AND TECHNOLOGY)

SIT 111: INTRODUCTION TO DATABASES

DATE: 30/4/2019

TIME: 2.00-4.00 PM

INSTRUCTIONS

Answer **question ONE** and any other **TWO** questions.

QUESTION ONE (30 MARKS)

- a) Explain the following terms as used in Database development
- (i) SDLC
 - (ii) Database system
 - (iii) DBMS
 - (iv) Data Redundancy
 - (v) ERD (2 marks each)
- b) Explain any **THREE** Data Models in a database development process (6 marks)
- c) State **FOUR** benefits of a database technology. (4 marks)
- d) Using examples where necessary, briefly explain **FIVE** components of a DBMS. (5 marks)
- e) Describe **FIVE** data types used in creating tables (5 marks)

QUESTION TWO (20 MARKS)

- a) Use an **Entity-Relationship diagram** to depict the following requirements for a library.
- i The library employs a number of librarians. A record is kept of each librarian's name, address, phone number and salary. (5 marks)
 - ii Each librarian can work in either section in the library. The Name of the section either shelving or front desk is recorded. (5 marks)
 - iii The front section constitutes of lending in terms of Borrower name, book author, Date borrowed and return date. (5 marks)
 - iv The shelving section involves arranging books according to their disciplines of use e.g. information science, BBIT, Health science, Computer science, Business Administration. (5 marks)

State any assumptions made in the design of the E-R diagram

QUESTION THREE (20 MARKS)

- a) Using an illustration discuss the stages in the database systems development cycle (6 marks)
- b) Define the following terms
- i. Relation
 - ii. Table
 - iii. Attribute
 - iv. Tuple
 - v. Degree
 - vi. Cardinality (1 mark each)
- c) Explain the following acronyms giving **THREE** examples each of how they can be expressed in SQL statements.
- i. DML (4 marks)
 - ii. DDL (4 marks)

QUESTION FOUR (20 MARKS)

- a) Show, giving appropriate SQL commands, step by _step how you would go about the following tasks:
- i) Create a database called UNIVERSITY RECORDS. (2 marks)
 - ii) Create a table called **Students** with five fields. Include the appropriate data types, primary key and other attributes. (5 marks)
 - iii) Add **four** records in the table. (4 marks)
 - iv) Select all **Female Students** in the table (2 marks)
- b) Describe briefly **FOUR** issues that normalization avoids. (4 marks)
- c) Discuss **THREE** constraints that can be used in database tables (3 marks)

QUESTION FIVE (20 MARKS)

- a) Briefly discuss **FIVE** security threats to a database. (5 marks)
- b) Discuss **FIVE** ways of providing security to the threats described in Q5a. (5 marks)
- c) Explain **THREE** types of relational keys that can be found in a relation. (6 marks)
- d) Describe **FOUR** roles that are found in a database environment. (4 marks)