MACHAKOS UNIVERSITY

University Examinations for 2019/2020 Academic Year

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF COMPUTING AND INFORMATION TECHNOLOGY

Supplementary University Examinations

BSC (COMPUTER SCIENCE)

SCO 206: DATABASE SYSTEMS

DATE: TIME: 2 HOURS

Instructions: Answer Question One and Other Two Questions.

Question 1 (30 Marks) [Compulsory]

a. Distinguish between data and information   (4 marks)
b. Explain two functions of a database   (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.   Data integrity
    ii.   Data Security   (4 marks)
e. Briefly describe three reasons for securing a database   (6 marks)
f. Draw an E-R Diagram for MUC that captures the following entities: Students. Lecturers,
    Library and Computer Lab.   (5 marks)
g. State three roles of a database administrator.   (3 marks)

Question 2 (20 marks)

a. Jack wants to design tables to be used in a given database. Using well labelled diagrams explain three types of entity relationships that he can use in the design.   (10 marks)

b. Models are used to represent the architecture of various systems. Discuss three types of database models that can be implemented in database design.   (10 marks)

Question 3 (20 marks)

a. Show, giving appropriate SQL commands, step by _step how you would go about:

i. Creating a database called Macha with two tables named **Project** (attributes: Code, Title, Manager, Budget) and **Employee** (attributes: Code, No, Name and Rate) in MySQL.

(4 Marks)

ii. Adding two records in each table.   (4 marks)

iii. Displaying names and rates employees   (2 marks)
b. James wants to develop a database for a given set up. Discuss all the steps in the database development cycle that he is supposed to follow.   (10 marks)

Question 4 (20 marks)

a. Describe the five components of the DBMS environment and discuss how they relate to each other.   (10 marks)

b. Distinguish between the logical and physical database schema   (4 marks)

d. Erick, a database administrator is supposed to protect the database from various threats. Advise him on three methods he can use to perform this task.   (6 marks)

Question 5 (20 marks)

(a) Normalization is a technique that is used to organize tables so as to reduce redundancy. Briefly discuss the process of normalization from first up to the third normal forms   (10 marks)

(c) A systems administrator wants to organize files in the machines that exist in their work place. Explain five file organization methods that he may use.   (10 marks)