



MACHAKOS UNIVERSITY

University Examinations for 2020/2021 Academic Year

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF COMPUTING AND INFORMATION TECHNOLOGY

SECOND YEAR SPECIAL/SUPPLEMENTARY EXAMINATION FOR

BACHELOR OF SCIENCE (INFORMATION TECHNOLOGY)

SCO 206/SMA 392/SST 200: DATABASE SYSTEMS

DATE: 26/3/2021

TIME: 8.30-10.30 AM

INSTRUCTION: Answer Question ONE and any other TWO Question

QUESTION ONE (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 TWO (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 THREE (20 MARKS)

- a) Show, giving appropriate SQL commands, step by _step how you would go about:
- 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)
 - Adding two records in each table. (4 marks)
 - 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 FOUR (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)
- c) 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 FIVE (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)
- b) 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)