



MACHAKOS UNIVERSITY COLLEGE

(A Constituent College of Kenyatta University)
University Examinations for 2015/2016 Academic Year

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF COMPUTING AND INFORMATION TECHNOLOGY

FIRST SEMESTER EXAMINATION FOR DEGREE IN BACHELOR OF SCIENCE IN
COMPUTER SCIENCE

SCO 206: DATABASE SYSTEMS

Date: 9/8/2016

Time: 8:30 – 10:30 AM

INSTRUCTIONS

This paper consists of FIVE questions

Answer question ONE and other TWO questions in this paper.

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:
 - 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 of 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)
- (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)