



MACHAKOS UNIVERSITY

Supplementary/Special Examinations

University Examinations 2017/2018

BACHELOR OF SCIENCE IN COMPUTER SCIENCE

SCO 206: DATABASE SYSTEMS

DATE: AUGUST 2018

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)