



MACHAKOS UNIVERSITY

University Examinations for 2017/2018

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF COMPUTING AND INFORMATION TECHNOLOGY

**SECOND YEAR SECOND SEMESTER EXAMINATION FOR
BACHELOR OF SCIENCE (MATHEMATICS AND COMPUTER SCIENCE)
BACHELOR OF SCIENCE IN COMPUTER SCIENCE**

SCO 206: DATABASE SYSTEMS

DATE: 5/12/2017

TIME: 2:00 – 4:00 PM

INSTRUCTIONS: Answer Question ONE and any other TWO Questions

QUESTION ONE (30 MARKS) (COMPULSORY)

- a) Distinguish between knowledge and information (4 marks)
- b) Explain two functions of a database management system (4 marks)
- c) State four types of keys that can be used in a relation. (4 marks)
- d) Explain the following concepts in relation to databases
- e) Briefly describe three reasons for normalizing a database (6 marks)
- f) Draw an E-R Diagram for Ruiru Hospital that captures the following entities: Patients, Doctors, Assistants and Wards. (5 marks)
- g) State three database management systems. (3 marks)

QUESTION TWO (20 MARKS)

- a) Jack wants to design tables to be used in a given database. Explain three types of entity relationships that he can use in the design. (6 marks)
- b) Models are used to represent the architecture of various systems. Discuss four types of database models that can be implemented in database design. (8 marks)
- c) State six advantages of a computerized database over the traditional file system. (6 marks)

QUESTION THREE (20 MARKS)

- a) Show, giving appropriate SQL commands, step by _step how you would go about:
 - i. Creating a database called Machakos with a table named **Employee** (attributes: Code, No, Name and Rate) in SQL. (4 marks)
 - ii. Adding two records in each table. (4 marks)
 - iii. Displaying names and rates employees (2 marks)
- b) James wants to design a database for a given set up. Discuss all the steps in the database design cycle that he is supposed to follow. (6 marks)
- c) State four qualities of a good database design. (4 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) Explain four benefits of database normalization. (8 marks)
- b) Discuss three types of relationships that can be implemented in databases using well labelled diagrams. (6 marks)
- c) Explain three factors that affect the selection of a database management system.(6 marks)