



THE MOMBASA POLYTECHNIC UNIVERSITY COLLEGE

(A Constituent College of JKUAT)

(A Centre of Excellence)

Faculty of Engineering & Technology

DEPARTMENT OF COMPUTER SCIENCE & INFORMATION TECHNOLOGY

**UNIVERSITY EXAMINATION FOR DEGREE IN BACHELOR OF SCIENCE
IN INFORMATION TECHNOLOGY**

(BSIT/M12)

ICS 2206: DATABASE SYSTEMS

SPECIAL/SUPPLEMENTARY EXAMINATION

SERIES: OCTOBER 2012

TIME: 2 HOURS

Instructions to Candidates:

You should have the following for this examination

- *Answer Booklet*

This paper consist of **FIVE** questions

Answer question **ONE** and any other **TWO** questions

Maximum marks for each part of a question are as shown

This paper consists of **TWO** printed pages

SECTION A (COMPULSORY)

Question One (30 marks)

a) Briefly discuss each of the following terms:

- i) Database Management System (2 marks)
- ii) Query (2 marks)
- iii) Integrity (2 marks)
- iv) Views (2 marks)

b) Discuss the differences between the candidate keys and the primary key of a relation. (4 marks)

c) A list of steps to be followed when developing a database system might include the following:

- i) System definition
 - ii) Requirement collection and analysis
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- iii) Database design
- iv) DBMS Selection
- v) Application Design

Give a brief explanation of each of the SIX steps listed above. **(12 marks)**

- d) Describe the main characteristics of the following:
- i) File based systems **(2 marks)**
 - ii) Database approach **(2 marks)**
- e) Discuss the disadvantages of file-based systems. **(4 marks)**

SECTION B (Answer Any Two Questions)

Question Two (20 marks)

- a) Assume that you are responsible for selecting a new DBMS product for a group of users in your organization. To undertake this exercise, you must first establish a set of requirements for the group and then identify a set of features that a DBMS product must provide to fulfill the requirements. Describe the process of evaluating and selecting the best DBMS product. **(10 marks)**
- b) Describe the components of the DBMS environment and discuss how they relate to each other. **(10 marks)**

Question Three (20 marks)

- a) Discuss the roles of the following personnel in the database environment.
- i) Database Administrator **(2 marks)**
 - ii) Data Administrator **(2 marks)**
 - iii) Application Developer **(2 marks)**
 - iv) End Users **(2 marks)**
- b) Discuss the concept of data independence and explain its importance in a database. **(6 marks)**
- c) Distinguish between conceptual, logical and physical database design. **(6 marks)**

Question Four (20 marks)

- a) Briefly discuss the **TWO** major components of SQL and what function they service? **(4 marks)**
- b) What are the advantages and disadvantages of SQL? **(6 marks)**
- c) With the help of a suitable example, explain the function of each of the clauses in the SELECT statement. **(6 marks)**
- d) Explain how GROUPED BY clause works. **(1 mark)**
- e) Define the **TWO** Principal Integrity rules of the relational model why it is desirable to enforce these rules. **(3 marks)**

Question Five (20 marks)

a) Describe the purpose of Normalization. Provide definitions for the first three normal forms.

(8 marks)

b) Normalize the following form up to third normal form.

(12 marks)