



# THE MOMBASA POLYTECHNIC UNIVERSITY COLLEGE

(A Constituent College of JKUAT)

*Faculty of Engineering & Technology*

DEPARTMENT COMPUTER SCIENCE & INFORMATION TECHNOLOGY

DIPLOMA IN INFORMATION TECHNOLOGY

**EIT 2204: DATABASE MANAGEMENT SYSTEM I**

SPECIAL/SUPPLEMENTARY EXAMINATION

**SERIES: FEBRUARY/MARCH 2012**

**TIME: 2 HOURS**

## **Instructions to Candidates:**

You should have the following for this examination

- *Answer Booklet*

This paper consist of **FIVE** questions in **TWO** sections **A & B**

Answer question **ONE (COMPULSORY)** and any other **TWO** questions

Maximum marks for each part of a question are as shown

This paper consists of **THREE** printed pages

## SECTION A (COMPULSORY)

### Question One 30 Marks

- a) Define the following terms as used in database systems
- i. Database
  - ii. DBMS
  - iii. Data abstraction
  - iv. Data independence
  - v. A Distributed database (10 Marks)
- b) Explain the user requirement stage in database design development process. (3 Marks)
- c) Differentiate between vertical and horizontal partitioning. (4 Marks)
- d)
  - i. Explain the traditional file system. (2 Marks)
  - ii. Explain three disadvantages of file based system. (6 Marks)
- e) With the aid of a diagram, explain the components of a database system. (5 marks)

## **SECTION B (Answer any two questions)**

### Question Two (15 Marks)

- a) Name and define **five** basic relational algebra operators. (5 marks)
- b) With some illustration, describe the differences in meaning between the terms relation and relation schema. (3 marks)
- c) Explain, why is the relational model more popular than the other database models. (2 marks)
- d) In a relational database, there are three main integrity constructs:
  - Key constraints
  - Entity constraints
  - Referential constraintsIndicate which of these constraints should be checked when an update modifies and attribute that is part of
  - i. A primary key
  - ii. A foreign key
  - iii. Neither (5 marks)

### Question Three (15 Marks)

- a) With the help of a diagram, explain the ANSI SPARC model of database architecture (6 Marks)
- b) Differentiate between physical and logical data independence (4 Marks)
- c) Define the following terms (2 Marks)

- i. Database
- ii. DBMS

d) List any **three** features of file based systems. (3 Marks)

**Question Four (15 Marks)**

- a) Explain **two** main characteristics of database technology. (4 Marks)
- b) Explain any **three** goals for a distributed DBMS (6 Marks)
- c) Explain with examples, how primary key and foreign key concepts is useful in relational data model? (5 Marks)

**Question Five 15 Marks**

- a) Explain each of the following concepts in the context of an object data model:
  - i) Encapsulation
  - ii) Inheritance
  - iii) Dynamic binding
  - iv) Object identity
  - v) Methods (5 Marks)
- b) Compare and contrast the RDBMS and the OODBMS in terms of
  - i) **Four** advantages of OODBMS over the RDBMS (4 Marks)
  - ii) **Two** typical applications of OODBMS compared to those of RDBMS (2 Marks)
- c) With examples, explain the network database model (4 Marks)