



THE MOMBASA POLYTECHNIC UNIVERSITY COLLEGE

(A Constituent College of JKUAT)

Faculty of Engineering & Technology

DEPARTMENT OF COMPUTER SCIENCE & INFORMATION TECHNOLOGY

BACHELOR OF TECHNOLOGY IN INFORMATION TECHNOLOGY (BTIT MAY 11)

EIT 4205: DATABASE SYSTEMS

SPECIAL/SUPPLEMENTARY EXAMINATION

SERIES: MAY/JUNE 2012

TIME: 2 HOURS

Instructions to Candidates:

You should have the following for this examination

- *Answer Booklet*

This paper consist of **FIVE** questions

Answer any **THREE** questions. Question **ONE** is Compulsory

Maximum marks for each part of a question are as shown

This paper consists of **TWO** printed pages

SECTION A (Compulsory - 30 marks)

Question One (30 Marks)

- Explain the following
 - Tuple
 - Normalization
 - Composite Key(6 marks)
- Explain **FIVE** advantages of using the database technology as opposed to the traditional filing system (10 marks)
- Explain the difference between the logical independence and physical independence (4 marks)
- State **FOUR** goals of requirement gathering (4 marks)
- Explain the **THREE** types of anomalies that can occur when too much is crammed into a single relation. (6 marks)

SECTION B (Answer any TWO questions – 40 Marks)

Question Two (20 marks)

Describe the 3 level ANSI-SPARC database management system architecture explaining in detail the functions of each level. (20 marks)

Question Three (20 marks)

A bank business has checking account, savings account and customers. The customers include individuals and institutions (business, organizations, etc). Both accounts have account number, amount deposited, amount withdrawn and balance as attributes. The institution customer has organization type, number of employees amongst others as attributes.

- a) Create a conceptual data model for this bank business
- b) Indicate the cardinalities on the relationships (20 marks)

Question Four (20 marks)

a) For each of the following relations, indicate which normal forms they conform to and show how they can be decomposed to the highest forms.

- i) ENROLLMENT (course#, student #, Grade, Instructor, room#)
 FD: Course# → Instructor, FD: Course# → Room
- ii) SALE (Date, Customer, Product, Vendor, Vendor-city, salerep)
 FD: Vendor → Vendor-city, FD: Product → Vendor

- b) Using the relational schemas of (a), write SQL statements;
 - i) That will create the relations ENROLLMENT and SALE
 - ii) That will insert relevant items in both relations
 - iii) That will view all the data items (20 marks)

Question Five (20 marks)

The following table form part of a database held in a relational DBMS.

Table Name	Fields
Hotl	<u>Hotel_no</u> , name, address
Room	<u>Room_no</u> , <u>Hotel_no</u> , type, price
Booking	<u>Guest_no</u> , <u>Hotel_no</u> , data_from, date_to, room_no
Guest	<u>Guest_no</u> , name, address

- a) Write SQL statement that will create the tables listed in the above table (8 marks)
- b) Write SQL statements to add at least a record in each table created in Question (a) above (8 marks)
- c) Write SQL statements to alter the price of all rooms by 5% increment. (4 marks)