THE MOMBASA POLYTEHNIC UNIVERSITY COLLEGE

(A Constituent College of Jkuat)

Faculty of Engineering and Technology

DEPARTMENT OF COMPUTER SCIENCE & INFORMATION TECHNOLOGY

DIPLOMA IN INFORMATION COMMUNICATION TECHNOLOGY - DICT 2K 10J

YR 2 SEM II

EIT 2210: DATABASE MANAGEMENT SYSTEMS II

END OF SEMESTER EXAMINATIONS

SERIES: AUGUST/SEPTEMBER 2011

TIME: 2 HOURS

Instructions to Candidates:

You should have the following for this examination

- *Answer booklet*
- *SMP tables and calculators can be used*

This paper consists of **TWO** sections **A** & **B**

Answer question **ONE (COMPULSORY)** in section **A** and any other **TWO** questions in section **B**

This paper consists of **THREE** printed pages

SECTION A –Answer all questions in this section (30 MARKS)

Question 1 (Compulsory)

a) Define a DBMS (2 marks)

b) List **TWO** reasons why we may choose to define a view in a database application (2 marks)

c) With the aid of a diagram, describe the components of a database system (8 marks)

d) Consider a database used to record students marks that students get in different exams of different course offering

i) Construct an E-R diagram that models exams as entities, and uses a ternary relationship for the above database (4 marks)

ii) Construct an alternative E-R diagram that uses only a binary relationship between students and course-offerings. Make sure that only one relationship exists between a particular student and course-offering pair, yet you can represent the marks that a student gets in different exams of a course offering (4 marks)

e) Explain how data redundancy is controlled in DBMS as compared to file-based systems (3 marks)

f) Briefly explain the concept of data warehousing (3 marks)

g) List the ACID properties and explain the usefulness of each (4 marks)

SECTION B (Answer any TWO questions) – 40 MARKS

Question 2

a) Explain distributed database system (2 marks)

b) Explain **FOUR** advantages of distributed databases (8 marks)

c) Explain the **THREE** major problems that may be caused by concurrent execution of transactions (6 marks)

d) Differentiate between the Client-Server design databases and Distributed databases (4 marks)

Question 3

a) Explain the **THREE** levels ANSI/SPARC database architecture with their significance (6 marks)

b) Describe major steps in database development life cycle (6 marks)

c) Explain the differences between CANDIDATE KEY, PRIMARY KEY, FOREIGN KEY and ALTERNATE KEY (4 marks)

d) Describe the differences in meaning between the terms relation and relation schema by illustrating your answer (4 marks)

Question 4

a) Write the SQL statement for the following English statements below

(i) Remove a table called the JOB table and all of its data
(ii) Show the employee first and last names and their job class description. (4 marks)

b) Explain the main concurrency control techniques in databases (6 marks)

c) Explain first normal form with example (5 marks)

d) List any **FIVE** properties of a relation (5 marks)

Question 5

a) Define the "integrity rules" in a relational database (4 marks)

b) Explain, how the object-oriented database model varies from the relational database model (4 marks)

c) A car-insurance company has customers who own one or more cars each. Each car has associated with it zero to any number of recorded accidents.

(i) Identify the Entities in the above case
(ii) What are relationship between the identified entities?
(iii) Draw an entity relationship diagram to demonstrate the connectivity between the various entities (12 marks)