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 constraints

Indicate 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)