THE MOMBASA POLYTECHNIC UNIVERSITY COLLEGE

(A Constituent College of JKUAT)

Faculty of Engineering & Technology

DEPARTMENT COMPUTER SCIENCE & INFORMATION TECHNOLOGY

HIGHER DIPLOMA IN COMPUTER STUDIES – HDIP 10A

ECT 3109: DISTRIBUTED SYSTEMS

END OF SEMESTER EXAMINATIONS

SERIES: DECEMBER 2011

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 distributed system

a) Middleware

b) Marshalling

c) Process (6 marks)

b) Define transparency in a distributed system. Enumerate and explain three aspects of transparency. (6 Marks)

c) Explain the Lamport's algorithm (5 Marks)

d) Explain **two** examples of distributed systems (2 Marks)

e) Differentiate between synchronous and asynchronous communication (4 Marks)

f) Explain **two** advantages of distributed systems (4 Marks)

g) List **three** techniques employed to implement a scalable, fault tolerant directory service. (3 Marks)

SECTION B (ANSWER ANY TWO QUESTIONS)

QUESTION TWO (15 Marks)

a) With examples describe the client server model? (5 Marks)

b) Discuss **three** challenges in the design of distributed systems. (6 Marks)

c) Explain **two** ways to achieve mutual exclusion in Distributed system (4 Marks)

QUESTION THREE (15 Marks)

a) With examples illustrate the difference between passive and active replication. (4 Marks)

b) Explain **three** types of fault (6 Marks)

c) Explain **three** types of failure models (5 Marks)

QUESTION FOUR (15 Marks)

a) Explain any **two** features of good distributed file system (4 Mark)

b) Differentiate between mutable and immutable files (4 Marks)

c) Name **three** advantages of file replication (3 Marks)

d) Briefly explain four methods of handling deadlocks in distributed systems

(4 Marks)

QUESTION FIVE (15 Marks)

a) Define a **fault** (1 Mark)

b) With the help of a diagram, describe the Remote Procedure call steps (10 Marks)

c) Explain **four** goals of computer security (4 Marks)