THE MOMBASA POLYTECHNIC UNIVERSITY COLLEGE

(A Constituent College of JKUAT)
(A Centre of Excellence)
Faculty of Engineering & Technology

DEPARTMENT OF COMPUTER SCIENCE & INFORMATION TECHNOLOGY

UNIVERSITY EXAMINATION FOR DEGREE IN BSCI. /BTECH. IN INFORMATION TECHNOLGOY (BSC IT 9S/BT IT M11)

ICS 2403/EIT 4312: DISTRIBUTED SYSTEMS

SPECIAL/SUPPLEMENTARY EXAMINATION
SERIES: OCTOBER 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 **ALL** questions in section **A** and any other **TWO** from section **B**
Maximum marks for each part of a question are as shown
This paper consists of **TWO** printed pages

SECTION A (COMPULSORY)

Question One (30 Marks)

a) Distinguish between a distributed system and a centralized system. **(4 marks)**

b) Identify **FOUR** applications of distributed systems stating three common platforms of deployment. **(7 marks)**

c) Assuming you are designing an enterprise system for MPUC. Discuss FIVE critical design goals of the project. Suggest any potential pitfalls of your design. **(10 marks)**

d) Differentiate between a homogeneous and a heterogeneous distributed system. **(3 marks)**

e) Identify **FOUR** elements of a distributed system architecture **(4 marks)**

f) List **TWO** characteristics of a distributed operating system. **(2 marks)**

SECTION B (Answer Any Two Questions)

Question Two (20 marks)

a)	Define the term process synchronization.	**(2 marks)**
b)	Identify **FOUR** general approaches to process synchronization.	**(4 marks)**
c)	List **FOUR** protocols used to attain concurrency control in distributed systems.	**(4 marks)**
d)	Differentiate between a thread, a mutex and a semaphore.	**(3 marks)**
e)	List **THREE** characteristics that make a distributed system to be transparent.	**(3 marks)**
f)	Describe **FOUR** types of hardware interconnection of distributed systems.	**(4 marks)**

Question Three (20 marks)

a)	Describe the function of an election algorithm and state when it should be created.	**(4 marks)**
b)	Write a typical algorithm for conducting an election. Use diagrams if necessary.	**(16 marks)**

Question Four (20 marks)

a)	List **FOUR** properties of a distributed system transaction.	**(4 marks)**
b)	Identify **FOUR** typical activities of a transaction.	**(4 marks)**
c)	Define group communication and state **THREE** types of group communications.	**(4 marks)**
d)	Identify **FOUR** group management functions.	**(4 marks)**
e)	Describe **FOUR** message ordering techniques.	**(4 marks)**

Question Five (20 marks)

a)	Define the term remote procedure call.	**(1 mark)**
b)	Identify the components of a call message.	**(4 marks)**
c)	List the **FIVE** elements of an RPC system.	**(5 marks)**
d)	Describe the steps in conducting a remote procedure call.	**(10 marks)**