

CHUKA



UNIVERSITY

UNIVERSITY EXAMINATIONS

**EXAMINATION FOR THE AWARD OF DEGREE OF BACHELOR OF
SCIENCE IN APPLIED COMPUTER SCIENCE**

ACMP 491: EMERGING TECHNOLOGIES IN APPLIED COMPUTER SCIENCE

STREAMS:

TIME: 2 HOURS

DAY/DATE: THURSDAY 7/12/2017

11.30 A.M – 1.30 P.M

INSTRUCTIONS:

- **Answer question one and any other two**

SECTION A:

QUESTION ONE: 30 MARKS

- a) Discuss Deadline-and-Budget Constrained Time and Cost optimization scheduling algorithms for Grid Computing (6 marks)
- b) Explain differences and similarities between public cloud, private cloud, and community cloud. (6 marks)
- c) A particular bank has branches in the major towns of the Kenya i.e. Nairobi, Nakuru, Meru, Kisumu ,Chuka and Mombasa. Each branch uses a computer for the management of its information, but the branches are not currently linked together. The bank wants to integrate the branches (nodes) using a computer network, and it has two options – to design either;
 - Option 1: A centralized system – all nodes linked to a central node by a computer network.

OR

- Option 2: A distributed system.

You are required to advice the company’s IT director (who is not conversant with distributed systems) about the following;

- (i). Explain to the director **FOUR** benefits that the users will be expected to observe when the company implements Option2 as compared to Option 1. (4 marks)

(ii). Explain to him a reason as to why the following are more difficult to implement for Option 2 as compared to Option 1.

(i). Naming scheme (ii). Consistency maintenance. (4 marks)

d) Explain the difference between Digital and cloud forensics. (4 marks)

e) Discuss the design issues of Grid Resource management systems (6 marks)

SECTION B: CHOOSE ANY OTHER TWO

QUESTION TWO: 20 MARKS

a) Discuss the major trends in computing that have led to the emergence of Cluster computing. (8 marks)

b) Discuss the Digital Investigation Process Model(DIPM) (8 marks)

c) Explain reasons for distribution in a distributed system. (4 marks)

QUESTION THREE: 20 MARKS

a) Dependability is an important challenge in designing and building Distributed systems. Define Dependability and explain its major properties. (8 marks)

b) Explain the following in details giving example in each case: (9 marks)

- i) Network Forensics
- ii) Forensic data analysis
- iii) Mobile device forensic

c) Explain what problems can happen when there is no concurrency control where multiple transactions are being executed at the same time. (3 marks)

QUESTION FOUR: 20 MARKS

a) Briefly explain the differences and similarities between grid computing, cloud computing. (4 marks)

b) What is a Single System Image (SSI)? Describe different SSI services that cluster middleware need to support (12 marks)

c) What is a distributed system? Give examples. (4 marks)

QUESTION FIVE: 20 MARKS

- a) Discuss different models or strategies for parallelization of applications (8 marks)
 - b) Why does naming systems play an important role in a distributed environment(4 marks)
 - c) What are Client and Server Stubs and how are they used in remote Procedure calls?
(4 marks)
 - d) Why is Digital Crime Scene Preservation and Documentation phase very important in achieving successful digital investigation (4 marks)
-