

**W1-2-60-1-6**

## JOMO KENYATTA UNIVERSITY

**OF**

**AGRICULTURE AND TECHNOLOGY**

# University Examinations 2014/2015

**FOURTH YEAR FIRST SEMESTER EXAMINATION FOR THE DEGREE OF BACHELOR OF BUSINESS INFORMATION TECHNOLOGY**

**ICS 2403 : DISTRIBUTED SYSTEMS**

**DATE: APRIL 2015 TIME: 2 HOURS**

**INSTRUCTIONS: ANSWER QUESTION ONE (COMPULSORY) AND**

**ANY OTHER TWO QUESTIONS.**

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**QUESTION ONE (30 MARKS)**

(a) Define the following terms as used in distributed systems:

[10 marks]

1. IPC
2. Message
3. NOS
4. Kernel
5. PCB

(b) With the help of a diagram, explain the different states of a process.

[6 marks]

(c) Distributed systems are termed as loosely coupled or tightly coupled. Explain the difference. [4 marks]

(d) Cloud computing is a technology of interest in the modern times. Discuss the future of the technology in distributed systems.

[5 marks]

(e) Discuss the issue of security in distributed systems and how the problem is being addressed. [5 marks]

**QUESTION TWO (20 MARKS)**

(a) Define the term RPC and discuss its similarity with ordinary procedure calls. [5 marks]

(b) With the aid of diagrams, describe the following distributed system models: [10 marks]

1. Workstation model.
2. Workstation server model.
3. Mini computer model.
4. Processor pool model.

(c) Distinguish between a network operating system and a distributed operating system in terms of system images, autonomy and fault tolerance. [5 marks]

**QUESTION THREE (20 MARKS)**

(a) Differentiate the following terms as used in distributed systems:

[8 marks]

1. System fault.
2. System error.
3. System failure.
4. Human error.

(b) Inter process communication (IPC) is a vital component of a distributed system. Explain the important functions that the mechanism serves. [8 marks]

(c) Define the term distributed operating system and explain how it is different from ordinary computer operating systems. [4 marks]

**QUESTION FOUR (20 MARKS)**

(a) Explain the function of the following network devices: [10 marks]

1. Router.
2. Bridge.
3. Switch.
4. Concentrator.
5. Repeater.

(b) Discuss some distributed system attacks. [5 marks]

(c) Explain the three scenarios in which a context switch occurs.

[5 marks]