



**JARAMOGI OGINGA ODINGA UNIVERSITY OF SCIENCE AND TECHNOLOGY**  
**SCHOOL OF INFORMATICS AND INNOVATIVE SYSTEMS**  
**UNIVERSITY EXAMINATION FOR THE DEGREE OF BACHELOR OF SCIENCE IN**  
**INFORMATION AND COMMUNICATION TECHNOLOGY**  
**3<sup>RD</sup> YEAR 1<sup>ST</sup> SEMESTER 2016/2017 ACADEMIC YEAR**  
**MAIN CAMPUS**

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**COURSE CODE: ICT 3316**

**COURSE TITLE: DISTRIBUTED SYSTEMS**

**EXAM VENUE: LAB 10**

**STREAM: ICT**

**DATE: 20/12/ 2016**

**EXAM SESSION: 2.00 – 4.00PM**

**TIME: 2.00 HOURS**

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**INSTRUCTIONS:**

- 1. Answer Question 1 (Compulsory) and ANY other two questions**
- 2. Candidates are advised not to write on the question paper**
- 3. Candidates must hand in their answer booklets to the invigilator while in the examination room**

### **QUESTION ONE (30 MARKS)**

- a) Explain the distinction between a distributed operating system and a network operating system. (6 marks)
- b) Why should the multi-threaded process model be preferred? (6 marks)
- c) Explain the following terms as applied to synchronization of processes. (6 marks)
- i) mutual exclusion
  - ii) critical region
  - iii) semaphore
- d) In the context of distributed operating system, explain the term distributed naming service (6 marks)
- e) Explain the basic concept of events and notifications in a distributed system. Identify the components of an events and notification system. (6 marks)

### **QUESTION TWO (20 MARKS)**

In the context of an interrupt, explain the concept of process control block. Identify the information stored in the process control block. (20 marks)

### **QUESTION THREE (20 MARKS)**

- a) In RMI name and explain the three common invocation semantics and the fault tolerance measures, if any, used to realize them. (12 marks)
- b) State the main components of Distributed operating system. (8 marks)

### **QUESTION FOUR (20 MARKS)**

Discuss the main issues in designing a distributed operating system. (20 marks)

### **QUESTION FIVE (20 MARKS)**

- a) Explain how process creation in a distribution environment differs from creation in a non-distributed environment. With regard to the distributed environments explain location policy and the considerations that might influence it. (10 marks)
- b) Outline the operation of a system in which multithreaded web browsers (clients) access a multithreaded web server. Assume that the latter employs the worker pool architecture. Highlight the advantage of this system over one where single threaded clients access a single threaded server. (10 marks)