



JARAMOGI OGINGA ODINGA UNIVERSITY OF SCIENCE AND TECHNOLOGY
SCHOOL OF INFORMATICS AND INNOVATIVE SYSTEMS
DEPARTMENT OF INFORMATION SYSTEMS AND TECHNOLOGY
UNIVERSITY EXAMINATION FOR THE DEGREE OF BACHELOR OF BUSINESS
INFORMATION SYSTEMS
YEAR 4 SEMESTERS 2, 2020/2020 ACADEMIC YEAR
SPECIAL / RE-SIT EXAMS
MAIN CAMPUS

COURSE CODE: IIT 3444

COURSE TITLE: HPC CLUSTER, VIRTUALIZATION & CLOUD COMPUTING

EXAM VENUE: STREAM: BSC BUSINESS INFORMATION SYSTEMS

DATE: EXAM SESSION:

TIME: 2.00 HOURS 130 students

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] Define the term virtual devices and states its two types [4 Marks]
- B] Explain the following issues in virtualization [6 Marks]
- i. Complexity
 - ii. Correctness
 - iii. Performance
- C] Briefly explain five essential characteristics of cloud model [10 Marks]
- D] Discuss the following logical panels under which the network device operates. [6 Marks]
- i. Control plane
 - ii. Data plane
 - iii. Management plane
- E] Explain the following types of attacks [4 Marks]
- i. Hypervisor Hyperjacking
 - ii. Side Channel Attacks

QUESTION TWO (20 MARKS)

- A] Define the following terms [3 Marks]
- i. Sandboxing
 - ii. Granularity
 - iii. A cluster
- B] List seven steps used for creating a new virtual machine [7 Marks]
- C] List and discuss four features of a cluster [8 Marks]
- D] State four parts that Virtual system security consists of [2 Marks]
- E] Briefly explain the following terms
- i. Cluster Computing [1 Mark]
 - ii. Virtualization [1 Mark]
 - iii. Cloud Computing [1 Mark]

QUESTION THREE (20 MARKS)

- A] Elucidate two sets of models used in cloud computing [4 Marks]
- B] Differentiate between the following terms [4 Marks]
- i. Virtual machine monitor
 - ii. Emulator
- C] By use of diagram, explain the following types of Hypervisor. [4 Marks]
- i. Bare Metal Hypervisor [4 Marks]
 - ii. Hosted Hypervisor [4 Marks]
- D] State four application areas of cloud base system. [2 Marks]
- E] Differentiate between Parallelism Computing and Distributed computing. [2 Marks]

QUESTION FOUR (20 MARKS)

- A] Explain why organizations are interested in cloud computing. [3 Marks]
- B] What are the security issues of virtualization in the cloud computing environments? [5 Marks]
- C] Briefly discuss two problems that parallel computing solve. [2 Marks]
- E] Discuss three main Pillars of Cloud Computing Security. [6 Marks]
- F] List four multidisciplinary areas where HPC technology can be implemented. [4 Marks]

QUESTION FIVE (20 MARKS)

- A] Discuss the following types of virtualization
- i. Server Virtualization [1 Marks]
 - ii. Client Virtualization [1 Marks]
 - iii. Storage Virtualization [1 Marks]
- B] Cloud security architecture is effective only if the correct defensive implementations are in place. Efficient cloud security architecture should recognize the issues that will arise with security management. The security management addresses these issues with security controls. These controls are put in place to safeguard any weaknesses in the system and reduce the effect of an attack. List and briefly describe the four categories cloud security controls. [8 Marks]
- C] Use the diagram to briefly state the different between symmetric and asymmetric clusters. [4 Marks]
- D] Use the diagram to briefly state the different between symmetric and asymmetric clusters. [4 Marks]
- E] Explain the term Live migration [1 Mark]

