

JARAMOGI OGINGA ODINGA UNIVERSITY OF SCIENCE AND TECHNOLOGY

SCHOOL OF INFORMATICS AND INNOVATIVE SYSTEMS

UNIVERSITY EXAMINATION FOR THE DEGREE IN COMPUTER SECURITY AND

FORENSICS

4TH YEAR 1ST SEMESTER 2018/2019 ACADEMIC YEAR

KISUMU LEARNING CENTER

COURSE CODE: IIT 3444

COURSE TITLE: HPC CLUSTER, VIRTUALIZATION & CLOUD COMPUTING

EXAM VENUE: STREAM:

EXAM SESSION:

TIME:

DATE:

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 1 [30 marks]

a)	Explain the difference between Cluster computing and Grid computing	(6 marks)
b)	Describe what cloud computing is	(3 marks)
c)	What are the various features of clusters?	(4 marks)
d)	Describe some of the services that are offered by different vendors for cloud computing	(6 marks)
e)	Explain the difference between high-performance computing (HPC) and High-throughput computing (HTC)	(5 marks)
f)	There's always a tradeoff between usability and security. What is the main problems of connecting all the nodes directly to the external network in a cluster?	(4 marks)
g)	What are some of the features of cluster computing?	(4 marks)
Question 2 [20 marks]		
a)	A deployment model in cloud computing defines the purpose of the cloud and the nature of how the cloud is located. Discuss some of the deployment models available	(8 marks)
b)	Discuss the technical benefits of cloud computing	(12 marks)
Question 3 [20 marks]		
	Cluster computing can be classified into many categories, discuss the various categories of classification What do you understand by the term RMS (Resource Management and Scheduling)? Discuss the components of the software that performs RMS	(12 marks) (8 marks)
Quest	ion 4 [20 marks]	
a)	Discuss the essential characteristics that cloud computing systems must offer	(10 marks)
b)	In High-Throughput Computing, there is middleware which is a software layer that enables the coordinated use of multiple resources which are drawn from a datacenter or geographically distributed networked computers. Discuss	

the common operations that the middleware needs to support the creation and execution of task-based applications. (10 marks)

Question 5 [20 marks].

- a) There are several frameworks that can be used to support the execution of task-based applications on distributed computing resources, including clouds. Discuss some of the popular software systems that support the task-computing.
 b) Discuss in the popular of the big task of the popular software systems that support the task-computing.
- b) Discuss the main components of a high-level architecture for supporting energy efficient resource allocation in a green cloud computing infrastructure (10 marks)