



(Knowledge for Development)  
**KIBABII UNIVERSITY**  
(KIBU)

**UNIVERSITY EXAMINATIONS**  
**2017/2018 ACADEMIC YEAR**

**SPECIAL/SUPPLEMENTARY EXAMINATIONS**  
**YEAR FOUR SEMESTER TWO EXAMINATIONS**  
**FOR THE DEGREE OF BACHELOR OF SCIENCE**  
**COMPUTER SCIENCE**

**COURSE CODE** : CSC 473E  
**COURSE TITLE** : PARALLEL AND CLUSTER  
COMPUTING

**DATE: 12/10/2018**

**TIME: 11:30 A.M - 1:30 A.M**

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**INSTRUCTIONS TO CANDIDATES**

**ANSWER QUESTIONS ONE AND ANY OTHER TWO.**

**QUESTION ONE [ COMPULSORY ] [30 MARKS]**

- a) Explain the taxonomy of clusters. [4marks]
- b) Outline any four IO needs for cluster computing. [4marks]
- c) Explain the historical trends in multiprocessors. [6marks]
- d) Discuss the Problems associated with I/O. [6marks]
- e) Performance is a key issue in parallel computing system. Explain five factors that influence the performance of a parallel computer system. [10marks]

**QUESTION TWO [20 MARKS]**

- a) State any four characteristics of distributed memory. [4marks]
- b) Explain key issues of concern when designing parallel programs. [8marks]
- c) Briefly highlight the historical trends of computer architectures. [8marks]

**QUESTION THREE [20 MARKS]**

- a) Explain any five Processor Characteristics for Multiprocessing. [10marks]
- b) Describe the components of Non-Hierarchical Loosely coupled Multiprocessor System [10marks]

**QUESTION FOUR [20 MARKS]**

- a) State eight advantages of cluster-computing. [8marks]
- b) Explain the main classification of shared memory machines. [4marks]
- c) Discuss the factors that contribute to scalability in massively parallel computers. [4marks]
- d) Parallel processing can be challenged in four programmatic levels. Explain them. [4marks]

**QUESTION FIVE [20 MARKS]**

- a) State five advantages of I/O in parallel computing platforms. [5marks]
- c) Explain the concept of NUMA. State its features. [5marks]
- d) Describe the concept of Single Program Multiple Data (SPMD). [4marks]
- e) To accurately gauge system performance, applications programs must be considered. Explain the Programs used for performance analysis. [6marks]