(Knowledge for Development)

KIBABII UNIVERSITY
(KIBU)

UNIVERSITY EXAMINATIONS
2020/2021 ACADEMIC YEAR

END OF SEMESTER EXAMINATIONS
YEAR THREE SEMESTER TWO EXAMINATIONS
FOR THE DEGREE OF
(COMPUTER SCIENCE)

COURSE CODE : CSC355E

COURSE TITLE : PARALLEL COMPUTER ARCHITECTURE

DATE: 14 / 10 /2021   TIME: 02.00 P.M – 04.00 P.M

INSTRUCTIONS TO CANDIDATES

ANSWER QUESTIONS ONE AND ANY OTHER TWO.

QUESTION ONE (COMPULSORY) [30 MARKS]

a) Define the following terms   (5 marks)
   i)   Serial computing
   ii)   Granularity
   iii) Supercomputing
   iv)   Pipelining
   v)   Shared memory

b) What characteristic that will a problem be solved via parallel computing   (4 marks)

c) How does Flynn's taxonomy distinguishes multi-processor computer architecture

                                                                   (2 marks)

d) State overheads that affects parallel computing   (5 marks)

e) Describe any two basic ways to partition computational work among parallel tasks

                                                                   (6 marks)

f) State and explain four important factors to consider when designing program's inter-task
   communication.   (8 marks)

QUESTION TWO [20 MARKS]

a) Describe parallel programming models   (8 marks)

b) What is distributed memory architecture   (2 marks)

c) State three advantages and three disadvantages of distributed memory architecture

                                                                   (6 marks)

d) Stated the characteristics of shared memory architecture   (4 marks)

QUESTION THREE [20 MARKS]

a) What are the reasons why one cannot have 100% speed of a programme   (5 marks)

b) State Amdahl's Law   (5 marks)

c) What are the reasons of using parallel computers   (10 marks)

QUESTION FOUR [20 MARKS]

a) Define load balancing (1 marks)

b) Explain two ways in which load balancing can be achieved in parallel computing

(4 marks)

c) Discuss various types of synchronization (9 marks)

d) Differentiate between SISD and SIMD? (6 Marks)

QUESTION FIVE [20 MARKS]

a) Define scalability and explain factors that contribute to scalability (8 Marks)

b) State five areas where parallel computing is used (5 Marks)

c) I/O operations are generally regarded as inhibitors to parallelism, explain

(5 marks)

d) What is Cache Coherence? (2 marks)