# KIBABII UNIVERSITY

## (KIBU)

# UNIVERSITY EXAMINATIONS
## 2019/2020 ACADEMIC YEAR
## SPECIAL/SUPPLEMENTARY EXAMINATION
## YEAR THREE SEMESTER TWO EXAMINATIONS
## FOR THE DEGREE IN
## (COMPUTER SCIENCE)

COURSE CODE    : CSC355E

COURSE TITLE    : PARALLEL COMPUTER
ARCHITECTURE

DATE:  03/02/2021    TIME: 08.00 A.M – 10.00 A.M

INSTRUCTIONS TO CANDIDATES

ANSWER QUESTIONS ONE AND ANY OTHER TWO

## QUESTION ONE [COMPULSSORY] [30 MARKS]

a) List the four classes of parallel computers to Flynn's Taxanomy (4 marks)
b) Briefly describe any three factors influencing parallel computing (6 marks)
c) Traditional technique of increasing uniprocessor performance are nearly reaching their limits. Explain (6marks)
d) Briefly describe the following parallel modes
   I. Shared address space (2 marks)
   II. message passing (2 marks)
   III. Data parallel programming (2 marks)
e) Explain any three desired characteristic of parallel system. (6 marks)
f) Discuss the Uniform memory access (UMA) (2 marks)

## QUESTION TWO [20 MARKS]

a) What is significance of 'Scalability? Derive the Amdahl's law for speedup performance.

(10 marks)

b) Define parallel computing (2 marks)
c) Explain why parallel computing is important (8 marks)

## QUESTION THREE [20 MARKS]

a) What is granularity ( 2marks)
b) Discuss the two types granularity and explain which is the best (8 marks)
c) Explain load balancing and discuss how it is achieved (10 marks)

## QUESTION FOUR [20 MARKS]

a) Discus using a diagram how different parallel computers are classifies according to Flynn's taxonomy. (12 marks)
b) Discuss various pipeline hazards. Give hazard detection and resolution techniques.(8 marks)

## QUESTION FIVE [20 MARKS]

a) Define scalability and explain factors that contribute to scalability (12 marks)
b) If you are beginning with an existing serial code and have time or budget constraints, then automatic parallelization may be the answer. However, there are several important caveats/limitations that apply to automatic parallelization state these limitations(8 marks)