THE TECHNICAL UNIVERSITY OF KENYA

FACULTY OF APPLIED SCIENCES AND TECHNOLOGY

SCHOOL OF COMPUTING & INFORMATION TECHNOLOGY

END OF SEMESTER EXAMINATION SERIES

FIRST SEMESTER EXAMINATIONS 2019/2020

FOURTH YEAR EXAMINATIONS FOR THE DEGREE OF

BACHELOR OF TECHNOLOGY IN COMPUTER TECHNOLOGY

BACHELOR OF TECHNOLOGY IN COMMUNICATION AND COMPUTER NETWORKS

ECSI 4104: DISTRIBUTED SYSTEMS AND NETWORKS

ECCI 4104: CLIENT-SERVER AND DISTRIBUTED SYSTEMS

TIME: 2 Hours

Instructions to candidates:

This paper consists of FIVE Questions.

Answer Question ONE [30 Marks] and any other TWO Questions [20 Marks Each].

Write your college number on the answer sheet.

This paper consists of 2 printed pages

Candidates should check the question paper to ascertain that all the pages are printed as indicated and that no questions are missing.

QUESTION ONE (30 MARKS) COMPULSORY

a) State four services that are provided by middleware.   4 marks

b) State three issues related to correctness in Inter Process Communication   3 marks

c) Explain three types of services which are provided by a distributed file system (DFS)   6 marks

d) State any six advantages of file replication   6 marks

e) State five types of transparency challenges   5 marks

f) With the aid of a diagram describe the centralized algorithm for achieving mutual exclusion 6 marks

QUESTION TWO (20 MARKS)

a) State any three problems encountered by global synchronization mechanisms

    3 marks

b) Enumerate any three properties of distributed algorithms   3 marks

c) Describe four types of distributed systems   8 marks

d) Discuss any three advantages of distributed object architectures.   6 marks

QUESTION THREE (20MARKS)

a) Distinguish between tightly coupled and loosely coupled systems

    4 marks

b) With reference to synchronization in message passing, explain the two types of semantics   4 marks

c) Outline four strategies for dealing with distributed deadlocks   4 marks

d) State the eight issues that have been addressed in the design of distributed systems   8 marks

QUESTION FOUR (20MARKS)

a) Describe any three types of possible attacks to a communication channel   6 marks

b) Outline the steps involved in a remote procedure call between clients and servers   5 marks

c) With the aid of a diagram, explain the operation of a bully algorithm   9 marks

QUESTION FIVE (20 MARKS)

a) State any four application areas of distributed systems in Kenya
        4 marks

b) Explain three types of failure masking by redundancy   6 marks

c) Enumerate any five types of failure   5 marks

d) With the aid block diagram, describe the frame format of a message block used in message passing
                                                                                5 marks