



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) Explain 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) Outline 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) Explain three problems encountered by global synchronization mechanisms
3 marks
- b) Describe any three properties of distributed algorithms 3 marks
- c) Describe four types of distributed systems 8 marks
- d) Explain four advantages of distributed object architectures. 6 marks

QUESTION THREE (20MARKS)

- a) Distinguish 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) Explain eight design issues to be handled by distributed systems 8 marks

QUESTION FOUR (20MARKS)

- a) Describe four types of 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) Explain any four application areas of distributed systems in Kenya
4 marks
- b) Explain three types of failure masking by redundancy 6 marks
- c) Describe five classifications of failures 5 marks
- d) With the aid block diagram, describe the frame format of a message block used in message passing
5 marks