



MURANG'A UNIVERSITY OF TECHNOLOGY

SCHOOL OF COMPUTING AND INFORMATION TECHNOLOGY

DEPARTMENT OF COMPUTER SCIENCE

UNIVERSITY ORDINARY EXAMINATION

2020/2021 ACADEMIC YEAR

**THIRDYEAR FITST SEMESTER EXAMINATION FOR BACHELOR OF SCIENCE
IN SOFTWARE ENGINEERING**

SCS303 – DISTRIBUTED SYSTEM

DURATION: 2 HOURS

Instructions to candidates:

1. Answer question One and Any Other Two questions.
2. Mobile phones are not allowed in the examination room.
3. You are not allowed to write on this examination question paper.

SECTION A: ANSWER ALL QUESTIONS IN THIS SECTION

QUESTION ONE (30 MARKS)

- a) Define the following terms as used in distributed system:
 - i. Logical clock
 - ii. Middleware
 - iii. Replication
 - iv. Commit (4marks)
- b) Explain two main goals of a distributed system. (4marks)
- c) By use of illustrations, compare and contrast network operating systems and distributed system (4marks)
- d) Clearly show the difference between a local call and remote call. (4marks)
- e) Describe any three dimensions of transparency in distributed system. (6marks)
- f) Using diagrams highlight the key difference between synchronous and asynchronous process. (4marks)
- g) Apart from attribute-base naming, explain other two naming schemes. (4marks)

SECTION B – ANSWER ANY TWO QUESTIONS IN THIS SECTION

QUESTION TWO (20 MARKS)

- a) Distinguish between remote cloning versus process migration. (4marks)
- b) Discuss three challenges faced in the design and implementation of distributed system. (6marks)
- c) Distributed system have to be fault tolerant, evaluate the five possible scenarios of crashes failure and how to resolve them. (10marks)

QUESTION THREE (20 MARKS)

- a) From the perspective of distributed systems the most important application of virtualization lies in cloud computing. Explain the three different type of services offered by cloud computing. (6marks)
- b) Describe how public key and private key security approach can be used in distributed system. (5marks)
- c) Explain the three types of models used to describe distributed computing system. (9marks)

QUESTION FOUR (20 MARKS)

- a) Outline the features of a good distributed file system. (4marks)
- b) In distributed system process will sometimes need to simultaneously access the same resources to prevent such concurrent access from corrupting the resource, or making it inconsistent, solution are needed to grant mutual exclusive access by process. Explain two types of approaches that can be used to achieve mutual exclusion. (6marks)
- c) Using appropriate diagrams, discuss two algorithms used in clock synchronization. (6marks)
- d) Computer systems generally offer four different types of interfaces at that different level. explain the four different types of interfaces (4marks)