MURANG'A UNIVERSITY OF TECHNOLOGY

SCHOOL OF COMPUTING AND INFORMATION TECHNOLOGY

DEPARTMENT OF COMPUTER SCIENCE

UNIVERSITY ORDINARY EXAMS

2021/2022 ACADEMIC YEAR

THIRD YEAR **FIRST** SEMESTER EXAMINATION FOR BACHELOR OF SCIENCE IN SOFT WARE ENGINEERING

SCS 303– DISTRIBUTED SYSTEMS

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) Explain the following terms in relation to distributed system: (8marks)
   i) Logical clock
   ii) Replication
   iii) Commit.
   iv) Heterogeneity.

b) Differentiate between a local call and remote call in relation to distributed systems.(2marks)

c) Cloud computing is the on-demand availability of computer system resources, especially data storage and computing power.
   Discuss three disadvantages of cloud computing strategy for organizations in the telecommunications industries. (6marks)

d) Explain two characteristics of a distributed system. (4marks)

e) Explain any four dimensions of transparency in distributed system. 4marks)

f) Discuss three types of remote procedural call as used in distributed systems. (6marks)

SECTION B – ANSWER ANY TWO QUESTIONS IN THIS SECTION

QUESTION TWO (20 MARKS)

a) Differentiate between the two types of clock synchronization algorithms in relation to distributed systems. (4marks)

b) Discuss the two categories of distributed system. (4marks)

c) With aid of an example clearly explain the architecture of a distributed system. (6marks)

d) A distributed File system (DFS) is any File system that allows access to files from multiple hosts sharing via a computer network? This makes it possible for multiple users on multiple machines to share files and storage resources. Describe any three features of a good distributed File system. (6marks)

QUESTION THREE (20 MARKS)

a) With aid of a diagram, describe the architecture of Java remote method innovation ((JRM) (6marks)

b) In a distributed systems, mutual exclusion is achieved through a concurrent access of process to a shared resource or data without corrupting it. Discuss the three basic approaches for implementing mutual exclusion in distributed systems. (6marks)

c) State two advantages of common object Request Brokerage Architecture (CORBA).(6marks)

d) The design and implementation of distributed system is posed by many challenges. Discuss three such challenges. (6marks)

QUESTION FOUR (20 MARKS)

a) With aid of a diagram, explain any three distributed models. (6marks)

b) It is a requirement that resilient distributed systems have to be fault tolerant. Evaluate the five possible scenarios of failure and how they are resolved. (8marks)

c) In a distributed system a Naming service is a specific service whose objective is mainly to provide a consistent and uniform way of naming resources. This allows other programs or services to localize them and obtain the required metadata for interacting with them. Explain any three such naming schemes. (6marks)