



(Knowledge for Development)

KIBABII UNIVERSITY

UNIVERSITY EXAMINATIONS 2021 / 2022 ACADEMIC YEAR

SPECIAL / SUPPLEMENTARY AMINATIONS YEAR FOUR SEMESTER ONE

FOR THE DEGREE OF COMPUTER SCIENCE

COURSE CODE : CSC 410

COURSE TITLE : DISTRIBUTED SYSTEMS

DATE: 11.00 A.M – 01.00 P.M TIME: 02.00 P.M – 04.00 P.M

INSTRUCTIONS TO CANDIDATES

ANSWER QUESTIONS ONE AND ANY OTHER TWO.

QUESTION ONE [30 MARKS]

- a. Explain Persistence and Synchronicity as used in Message Oriented Communication in distributed systems [4Marks]
- b. Differentiate between message oriented and stream oriented communication [4Marks]
- c. Discuss the role of middleware in Distributed systems [4Marks]
- d. Define the following terms as used in distributed systems [2Marks]
- i. **Name**
 - ii. **Entity**
- e. Define Distributed Systems [2Marks]
- f. With the aid of a well labeled diagram explain a simple architecture of a distributed system [4Marks]
- g. Define Remote procedure call as used in Distributed systems [2Marks]
- h. Explain the following terms as used in Distributed Systems [4Marks]
- i. Distributed control algorithms
 - ii. Deadline scheduling
- i. Explain the Bully Algorithm as used in distributed systems [2Marks]
- j. Identifier is the Name that is used to uniquely identify an entity, explain the properties of a true identifier [2Marks]

QUESTION TWO [20 MARKS]

- a. Give the difference between Performance transparency and Scalability transparency [4Marks]
- b. Discuss the five Peer-to-Peer Motivations [10 Marks]
- c. Give two advantages and two disadvantages of Remote Procedure call [4Marks]
- d. Define peer-to-peer networks as used in Distributed systems [2Marks]

QUESTION THREE [20 MARKS]

- a. Give the difference between Location transparency and Migration transparency [4Marks]
- b. Discuss the Eight Fallacies of Distributed systems [10 Marks]
- c. Differentiate between Local Call and Remote Procedure call [4Marks]
- d. Define Distributed Transaction as used in Distributed systems [2Marks]

QUESTION FOUR [20 MARKS]

- a. Give the difference between a Two-tier architecture and a Three-tier architecture in distributed systems [4Marks]
- b. Explain the following language support terms as used in Distributed systems [10Marks]
 - i. Partitioning
 - ii. Configuration
 - iii. Allocation
 - iv. Transparent execution
 - v. Reconfiguration

- c. A distributed system can operate correctly even as some aspect of the system is scaled to a larger size. Briefly explain the three components for scale **[6 Marks]**

QUESTION FIVE [20 MARKS]

- a. Election algorithm assumes that every active process in the system has a unique priority number. Explain. **[4Marks]**
- b. With the aid of a well labeled diagram explain the steps that take place during Remote Procedure Call **[10Marks]**
- c. Fault tolerance is usually achieved by providing redundancy. Redundancy is defined as those parts of the system that are not needed for its correct functioning briefly explain the three types of redundancy **[6 Marks]**

25