



ZIMBABWE EZEKIEL GUTI UNIVERSITY

FACULTY OF HEALTH, SCIENCE AND TECHNOLOGY

DEPARTMENT OF DIGITAL TECHNOLOGY

EXAMINATION PAPER

COURSE CODE : CDT 404
COURSE TITLE : DISTRIBUTED SYSTEMS
SPECIAL REQUIREMENTS : None
DURATION : 3 Hours
LEVEL : 4.2
DATE : ~~December 2022~~
30 NOV 2022

INSTRUCTIONS TO CANDIDATES:

1. This paper consists of 5 questions
2. Each Question Carry 25 Marks
3. Answer Any 4 Questions
4. Start each Question on a new page

There are 3 printed pages for this question paper

Question 1

In a distributed system, clients send requests to access data managed by servers, across the company Metropolitan Network and the world wide web. The directors are worried about the safety of their data, computer assets etc. As an IT Manager can you write a recommendation letter to the board advising them on what need to be done to safeguard their data also advising them on the measures already in place to secure company data. [25 Marks]

Question 2

- i. What is Fault Tolerance [2 Marks]?
- ii. What are the are main reasons for occurrence of a Fault in Distributed Systems [4 Marks]
- iii. Why do we need fault tolerance in a Distributed Systems [2 Marks]?
- iv. Implementation of a fault tolerance technique depends on the design, configuration and application of a distributed system. Designers have suggested 5 principles which have been followed. Describe those principles [17 Marks]

Question 3

Define Inter Process Communication [2 Marks]

Define Group Communication [1 Mark]

What are the main Characteristics of Inter Process Communication [10 Marks]?

Describe the Following in Communication in distributed Systems give examples. [12 Marks]

- i. Middleware
- ii. Client Server Communication
- iii. Group Communication

Question 4

Can you describe the following architectures in Distributed systems giving examples [10 Marks]?

- i. Hybrid
- ii. Centralized
- iii. Decentralized

Each of the above has its own advantages and disadvantage. Can you list the advantage and disadvantage of each architecture [**15 Marks**]?

Question 5

Briefly describe the Cristian's, Election and Berkeley algorithm in accordance with data Synchronization in distributed Systems [**20 Marks**]

List any advantages of data synchronization [**5 Marks**]