

**CHUKA**



**UNIVERSITY**

**UNIVERSITY EXAMINATIONS**

**EXAMINATION FOR THE AWARD OF DEGREE OF  
BACHELOR OF SCIENCE (COMPUTER SCIENCE)**

**COMP 414/COSC 465: DISTRIBUTED SYSTEMS**

**STREAMS: BSC (COMP SCIE) Y4S2**

**TIME: 2 HOURS**

**DAY/DATE: WEDNESDAY 08/04/2020**

**8.30 AM – 10.30 AM**

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**INSTRUCTIONS:**

- **Answer question ONE in section A and any other TWO questions from section B**
- **Do not write on this question paper**
- **This is a closed book exam, Reference materials are not allowed in exam room**

**SECTION A: COMPULSORY**

**Question 1 [30 Mks]**

- a) Briefly explain the meaning of Distributed Systems. [4mks]
- b) To support heterogeneous computers and networks while offering a single view, Distributed Systems are often organized by means of a layer of software. Discuss [6mks]
- c) Several types of transparencies exist in a distributed system. Discuss any four [4mks]
- d) In order to mask failure in Distributed System, there is need for them to be detected as Well. Discuss. [6mks]
- e) Threads usage in Distributed Systems presents several benefits. Explain any two. [4mks]
- f) In Distributed Systems, virtualizations can take place in many different ways. Explain. [4mks]
- g) Time synchronization algorithms such as NTP, the time server is passive. Explain a problem that can arise in using a passive time server. [2mks]

**SECTION B: ANSWER ANY TWO QUESTIONS FROM THIS SECTION**

**Question 2 [20 mks]**

a) Many Distributed Algorithms requires one process to act as coordinator. Explain how this can be achieved. [10mks]

b) The fundamental to distributed systems is the concurrency and collaboration among multiple process. Explain how this can be achieved without corrupting the shared resource. [10mks]

**Question 3 [20 mks]**

a) What is a physical clock, explain how clock synchronization done in distributed system [10mks]

b) Being Fault Tolerance means that the system is also dependable. Discuss the properties of a dependable system. [10mks]

**Question 4[20 mks]**

a) A system that fails is not adequately providing the service it was designed for. Discuss the various types of failures that can occur in a Distributed system [10mks]

b) Discuss the role of virtualization in Distributed System [10mks]

**Question 5 [20 mks]**

a) What is process Migration? Discuss the various issues that need to be addressed when Designing process migration facility. [4mks]

b) Explain the architecture of virtual machines in Distributed System [8mks]

c) The goal of RPC is to hide Communication by masking remote procedure calls. Failure can also occur in RPC systems. Discuss [8mks]

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