CHUKA   **UNIVERSITY**

UNIVERSITY EXAMINATIONS

EXAMINATION FOR THE AWARD OF
DIPLOMA IN COMPUTER SCIENCE

COSC 0262: DISTRIBUTED SYSTEMS

STREAMS: DIP COMP SCI Y1S2

TIME: 2 HOURS

DAY/DATE: TUESDAY   6 /07/ 2021   **2.30 PM – 4.30 PM**

INSTRUCTIONS:

- Answer question **ONE** and **TWO** other questions
- Do not write anything on the question paper
- This is a **closed book exam**, No reference materials are allowed in the examination room
- There will be **NO** use of mobile phones or any other unauthorized materials
- Write your answers legibly and use your time wisely.
- Marks are awarded for clear and concise answers.

SECTION A (Answer ALL questions)
QUESTION ONE (30 Marks)

a) Define the following terms:

    i.   Transparency   (2 marks)

    ii.   Concurrency   (2 marks)

    iii.   Distributed system   (2 marks)

    iv.   Socket   (2 marks)

b) What is the difference between a thread and a process?   (2 marks)

c) List TWO advantages and TWO disadvantages of sharing resources in a distributed system   (4 marks)

d) Explain TWO important goals for an open distributed system   (4 marks)

e) Differentiate between data-centered architecture and event-based architecture.

(4 marks)

f) What are Client and Server Stubs and how are they used in remote procedure calls?

(4 marks)

g) Explain TWO characteristics that differentiate a distributed system from a centralized system. (4 marks)

QUESTION TWO (20 Marks)

a) Using a diagram, explain the following architectural styles:

   i. Object-oriented architecture (4 marks)

   ii. Layered architecture (4 marks)

b) Explain THREE advantages of threads in non-distributed system (6 marks)

c) Scalability of a system can be measured along at least three different dimensions. Discuss

(6 marks)

QUESTION THREE (20 Marks)

a) A number of corporate organizations have of late gone full blast in adopting distributed systems. Briefly explain FOUR reasons behind most organizations adopting a distributed system as opposed to the traditional mainframe or centralized computing (8 marks)

b) Discuss the following layered architectural styles: -
   i. The user-interface level (3 marks)

   ii. The processing level (3 marks)

   iii. The data level (3 marks)

c) Replication involves creating and maintaining copies of services and data provided by a distributed system. Explain three advantages of file replication. (3 marks)

QUESTION FOUR [20 Marks]

a) Using a diagram, describe the client-server model. (6 marks)

b) Discuss THREE goals of a distributed system. (6 marks)

c) With an aid of a diagram, define the term middleware (6 marks)

d) Explain the role of middleware in distributed systems (2 marks)

QUESTION FIVE [20 Marks]

a) Discuss FIVE types of distribution transparency. (10 Marks)

b) Remote Procedure Call (RPC) is a protocol that allows programs to call procedures located on other machines. With the help of a diagram briefly describe what takes place between the two machines during this process (10 marks)

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