

CHUKA



UNIVERSITY

UNIVERSITY EXAMINATIONS

SECOND YEAR EXAMINATION FOR THE AWARD OF DIPLOMA IN  
COMPUTER SCIENCE

COSC 0262: DISTRIBUTED SYSTEMS

STREAMS: DIP. COMP. SCI Y2S2

TIME: 2 HOURS

DAY/DATE: FRIDAY 26/03/2021

2.30 P.M. – 4.30 P.M

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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:
- Transparency (2 marks)
  - Concurrency (2 marks)
  - Process (2 marks)
  - Distributed system (2 marks)
  - Socket (2 marks)
- b) List TWO advantages and TWO disadvantages of sharing resources in a distributed system (4 marks)
- c) Differentiate between data-centered architecture and event-based architecture. (4 marks)
- d) What are Client and Server Stubs and how are they used in remote procedure calls? (4 marks)

## COSC 0262

- e) While stating what they stand for, distinguish between TCP and UDP (4 marks)
- f) State 2 characteristics of distributed systems (4 marks)

### QUESTION TWO (20 Marks)

- a) Using a diagram, explain the following architectural styles:
  - i. Object-oriented architecture (5 marks)
  - ii. Layered architecture (5 marks)
- b) Explain THREE advantages of threads in non-distributed system (6 marks)
- c) Differentiate between administrative and geographical scalability? (4 marks)

### QUESTION THREE (20 Marks)

- a) Using a diagram, describe the client-server model. (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) Explain three advantages of file replication. (3 marks)

### QUESTION FOUR [20 Marks]

- a) Discuss FOUR goals of a distributed system. (8 marks)
- b) With an aid of a diagram, define the term middleware (6 marks)
- c) Explain THREE advantages of distributed systems (6 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. Outline the steps in which a remote procedure call occurs (10 marks)