



PAN AFRICA CHRISTIAN UNIVERSITY

BACHELOR OF SCIENCE INFORMATION TECHNOLOGY

END OF TERM EXAMINATION

DEPARTMENT: COMPUTING & INFORMATION TECHNOLOGY

COURSE CODE: BSIT306

CAMPUS: ROYSAMBU

COURSE TITLE: DISTRIBUTED SYSTEMS

EXAM DATE: DD MM 2024

TIME: START _____ HOUR _____ END HRS

INSTRUCTIONS

- This exam script has **TWO (2)** sections.
- Read all questions carefully before attempting.
- Answer All questions in Section **A** and any other THREE questions in Section **B**.
- None programmable calculators permitted
- Calculators on phones, tablets and computers are NOT permitted in Theory Papers

SECTION A: (Answer ALL questions in this section)

QUESTION ONE

- a) Explain how distributed computing has shaped communication in society **(1 Mark)**
- b) State the architecture model used in distributed systems. **(2 Marks)**
- c) Explain the significance of inter-process communication in a distributed computing paradigm **(2 Marks)**
- d) Justify the use of space and time coupling and uncoupling in distributed computing **(2 Marks)**
- e) Describe TWO applications of distributed computing in learning institutions **(2 Marks)**
- f) State any TWO desirable attributes for distributed systems in the computing realm **(1 Mark)**

SECTION B: (Answer any THREE (3) questions in this section)

QUESTION TWO

- a) Distributed systems of clients and servers offer services without regard to performance or speed. State TWO additional hardware or software enhancements that could be made to distributed computing systems to add some degree of performance improvement. **(2 Marks)**
- b) Describe any TWO bottlenecks found in a distributed system environment **(4 Marks)**

- c) Explain any TWO types of process communication as found in distributed systems.

(4

Marks)

QUESTION THREE

- a) State TWO ways in which operating systems influence the distributed objects

(2

Marks)

- b) The reliability of a distributed system depends on the failure of an 'unknown node' in the system. Discuss this statement in the broader context of the distributed system's definition.

(4 Marks)

- c) Explain any TWO middleware protocols and their rationale in distributed computing.

(4

Marks)

QUESTION FOUR

- a) State any TWO similarities found between RPC and RMI as used in distributed systems

(2

Marks)

- b) Concurrent processing is central to distributed computing; which is efficiently supported by several operating systems concepts and mechanisms. Briefly discuss TWO of these mechanisms for the support.

(4

Marks)

- c) Explain TWO fundamental reasons to implement distributed systems in a microfinance banking institution

(4

Marks)

QUESTION FIVE

- a) The computing nodes in distributed systems are often heterogeneous so their co-existence depends on the form of resolutions of their different data representations. Describe how this cross-platform data exchange issue is often handled. **(3 Marks)**

b) List any THREE types of communication paradigms in distributed systems **(3 Marks)**

c) Explain TWO significances of clients and servers in a distributed computing environment. **(4 Marks)**

QUESTION SIX

a) Describe the Peer-to-Peer computing paradigm using real-life applications **(3 Marks)**

b) Explain the implication of implementing a threaded computing environment as found in distributed systems. **(4 Marks)**

c) State THREE types of distributed computing models **(3 Marks)**

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