



MANICALAND STATE UNIVERSITY OF APPLIED SCIENCES

FACULTY OF ENGINEERING, APPLIED SCIENCES AND TECHNOLOGY

DEPARTMENT: COMPUTER SCIENCE AND INFORMATION SYSTEMS

MODULE: BLOCKCHAIN TECHNOLOGIES

CODE: INSY416

SESSIONAL EXAMINATIONS

APRIL 2024

DURATION: 3 HOURS

EXAMINER: MR L. RUVINGA

INSTRUCTIONS

- 1. Answer ALL questions in Section A*
- 2. Answer Any **three (3)** questions in Section B*
- 3. Start a new question on a fresh page*
- 4. Total marks 100*

Additional material(s): None

SECTION A:

Question 1

- a) Explain the following terms:
- i) 51% Attack [2 Marks]
 - ii) Double Spend Problem [2 Marks]
 - iii) Distributed Ledger Technology [2 Marks]
 - iv) Proof of Work [2 Marks]
 - v) Proof of Stake [2 Marks]
- b) Define a smart contract and explain how it may be beneficial to the Real Estate sector in Zimbabwe the advantages of smart contracts. [10 Marks]
- c) Identify four (4) use cases of Blockchain in a country like Zimbabwe, explaining how the technology could be applied in each case [20 Marks]

SECTION B:

Question 2

Whilst Blockchain technology is increasingly gaining acceptance across all sectors of the global economy, its development is faced with various challenges that slow down its progression. In a developing country such as Zimbabwe, identify and discuss any five (5) of the key challenges that hinder Blockchain development. [20 Marks]

Question 3

Traders at Green Market Mutare are looking at modernizing their marketplace by facelifting the space into a world class market facility. Resource mobilization has been a major problem. However, a crowdfunding initiative utilizing the blockchain has been proposed. As a Blockchain developer discuss the design principles that you would enlist to guide you in completing the task at hand. [20 Marks]

Question 4

- a) Explain the following terms:
- i. Merkle Tree [2 Marks]
 - ii. Genesis Block [2 Marks]
 - iii. Encryption [2 Marks]
 - iv. Hash Rate [2 Marks]
- b) One of the major goals of Distributed ledger systems is to achieve INTEGRITY. Discuss the three major components of integrity of a software system [12 Marks]

Question 5

- i. Write a brief on how government can promote the adoption of Blockchain Technologies [10 Marks]
- ii. In your view, explain why Ethereum Virtual Machine could become the global settlement layer [10 Marks]

END OF EXAMINATION