nAMIBIA UNIVERSITY
OF SCIENCE AND TECHNOLOGY

Faculty of Computing and Informatics

Department of Computer Science

THIS QUESTION PAPER CONSISTS OF 2 PAGES
(Excluding this front page)

INSTRUCTIONS

1. Answer ALL the questions.
2. Write clearly and neatly.
3. Number the answers clearly.
4. When answering questions you should be guided by the allocation of marks. Do not give too few or too many facts in your answers.

PERMISSIBLE MATERIALS
1. None

Question 1

Accepting payment information introduces significant security and reliability considerations for the system's design and organizational processes. Outline two (2) security and reliability considerations you would consider when designing a system that accepts payment information. [4 marks]

Question 2

Outline three (3) costs reliability and security risks that can be introduced by outsourcing the payment functionality of a system to a third party. [6 marks]

Question 3

Differentiate between initial velocity and sustained velocity. How do the two (2) concepts impact and influence the design of security and reliability in secure systems? [6 marks]

Question 4

Designing a system to be understandable, and maintaining that understandability over time, requires effort. Outline three (3) reasons why understandability is important in secure system design. [6 marks]

Question 5

Explain what unmanaged complexity is? How does unmanaged complexity impact the understandability of a system? [4 marks]

Question 6

Outline two (2) disadvantages of allowing arbitrary rollbacks in a secure system design. [4 marks]

Question 7

The Slashdot effect, also known as slashdotting, occurs when a popular website links to a smaller website, causing a massive increase in traffic. This overloads the smaller site, causing it to slow down or even temporarily become unavailable. This has the same effect as a denial-of-service attack, albeit accidentally. *To avoid these cascading failures, you can design your system to instead degrade gracefully. Outline three (3) ways you can design your system to respond by degrading gracefully.* [10 marks]

Question 8

Outline why it is important to consider the role of security when ranking services within an organization in terms of criticality. [4 marks]

Question 9

Outline at least three (3) advantages that automatic response to deteriorating conditions in a system will have over human response/intervention. [6 marks]

Question 10

Complexity often accumulates inadvertently, but this can lead to tipping-point situations where a small and apparently innocuous change has major consequences for a system's reliability or security. Outline and explain four (4) architecture decisions you can take to make changes to your system easier? [10 marks]

***************************END OF EXAM*********************************