



**NAMIBIA UNIVERSITY
OF SCIENCE AND TECHNOLOGY**

FACULTY OF COMPUTING AND INFORMATICS

DEPARTMENT OF COMPUTER SCIENCE

QUALIFICATION: BACHELOR OF COMPUTER SCIENCE	
QUALIFICATION CODE: 07BACS	LEVEL: 6
COURSE CODE: ISS610S	COURSE NAME: IT Systems Security
DATE: JUNE 2019	PAPER: THEORY
DURATION: 3 HOURS	MARKS: 100

FIRST OPPORTUNITY EXAMINATION QUESTION PAPER	
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INSTRUCTIONS
<ol style="list-style-type: none">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 in (). Do not give too few or too many facts in your answers.

PERMISSIBLE MATERIALS

1. Non programmable Scientific Calculator.

THIS QUESTION PAPER CONSISTS OF 4 PAGES (Excluding this front page)

3. Users interact with databases through commands to the DBMS that retrieve, modify, add, or delete fields and records of the database. These commands are called:

- A. Syntax
- B. SQLi
- C. Queries
- D. XSS

4. The term Big Data means analysis of massive amounts of _____, often collected from different sources, and in different data formats.

- A. Data
- B. Traffic
- C. Protocols
- D. Intrusions

5. _____ uses statistics, machine learning, mathematical models, pattern recognition, and other techniques to discover patterns and relations on large datasets.

- A. Data Mining
- B. Cloud Computing
- C. Machine Learning
- D. AI

6. Intrusion _____ System, is a technology with built-in protective response to try and block or stop harm.

- A. Detection
- B. Prevention
- C. Detention
- D. Proactive

7. Browser attacks generally seek to obtain sensitive information like:

- A. Age
- B. Data
- C. Name and Surname
- D. Passwords

8. A _____ is a function which records or keystrokes on a computer.

- A. Keystroker
- B. Keyrecorder
- C. keylogger
- D. Loggerkey

9. To describe both fault and failure, Security Engineers use the term _____.

- A. Flaw
- B. Flow
- C. Fault
- D. Floor

10. A program that appears to be useful but has undocumented hidden malicious features.

- A. Trojan Horse
- B. Malware
- C. Tricky Horse
- D. Spyware

Question 3 [18 Marks]

- i. Explain what is meant by (a) Vulnerability (b) Threat (c) Harm. (6)
- ii. How is Denial of Service (DoS) different from Distributed Denial of Service (DDoS)? (2)
- iii. Mention and explain the 3 principles of the CIA Triad. (6)
- iv. The CIA Triad has two additional principles. (a) Mention and (b) explain how those two principles help in IT Systems Security. (4)

Question 4 [12 Marks]

- i. How is Authentication different from Authorization in IT Systems security? (4)
- ii. Authentication is the first step in access control, and there are three common factors used for authentication. Name and explain the three authentication mechanisms. (6)
- iii. Discuss the concept of Single-Sign-On (SSO). (2)

Question 5 [8 Marks]

- i. Vitjitua is a System Administrator for Matisa Travel Agency CC. She created a file that runs an online application through the company's website. She needs to share it with group members but wants to make sure that only she has full rights over the file, while her group members should only be able to read and modify the file, other users should only be able to execute. Give the permissions that Vitjitua must assign to that file using a Debian operating system. (2)

#mkdir Files

#touch Files/information.exe

#chmod ___ ___ Files/information.exe

- ii. Vitjitua realises that a modification was made to the file, which led to a compromise of the online application on the website. No one will admit to the modification, and there was no external intrusion into the system. Vitjitua decided to view the record of events recorded for that file.
 - (a) What document/file must she view to get those records? (2)
 - (b) Which principle of the CIA triad will Vitjitua be addressing? (2)

Question 6 [11 Marks]

- i. What is asymmetric encryption? (2)
- ii. What is symmetric encryption? (2)
- iii. Give one example of an asymmetric encryption algorithm, and one example of symmetric encryption algorithm. (2)
- iv. Web Browsers are trusted with sensitive information, making them a target of malicious attacks. What are the three Web Browser attack vectors? (3)
- v. Explain what is meant by Buffer overflow. (2)

Question 7 [10 Marks]

- i. Name and explain the three cloud computing service models. (6)
- ii. You are the Security Administrator of a certain company. The company deals with forensics investigations and the company would like to seek for cloud services to store data, as this data is highly confidential.
- (a) Which cloud computing deployment model would you recommend the company to use in order to ensure that the risk of leaking confidential information is kept to minimum. (2)
- (b) Explain how your recommendation will help with the objective set in (a). (2)

Question 8 [9 Marks]

- i. Name any command line tool that is useful in troubleshooting DNS services. (1)
- ii. What is the role of a DNS server on a network? (2)
- iii. What is an "A Record" and what is a "PTR Record" in DNS? (4)
- iv. What could happen if the DNS server stopped working on the network? (2)

Question 9 [Marks]

- i. Why is a Self-Signed certificate not trusted, and what would be the alternative to Self-Signed certificates? (4)
- ii. Privacy is controlled disclosure, in what the subject chooses what personal data to give out, when, and to whom. There are 8 Privacy Principles and Policies. One of them is Data Quality. What does this Privacy Principle/Policy say? (2)

Question 10 [8 Marks]

- i. Explain what is meant by risk analysis in IT Systems security. (2)
- ii. List the 6 steps of Risk Analysis (6)

----End of Question Paper----