



University of Ruhuna- Faculty of Technology
Bachelor of Information Communication Technology Honours Degree
Level 3 (Semester II) Examination, November/December 2025
Academic year 2023/2024

Course Unit: ICT3243 – Network, Computer and Application Security (Written)
Duration: 2 hours

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IMPORTANT INSTRUCTIONS

- This is a Closed Book examination.
- The medium of this examination is English.
- All four (04) questions are given equal marks.
- Answer all four (04) questions.

1)

- a) Explain the “AAA” concept with suitable examples. [27 marks]
- b) TechStream Entertainment (Pvt.) Ltd. operates a cloud-based digital media streaming platform that delivers high-definition content to subscribers across the South Asian region.

As a Security Analyst Intern, you have been assigned to prepare an executive-level briefing on **three (03)** major categories of malicious software that could compromise the platform’s infrastructure, user data, and service continuity.

Further, you must recommend a minimum of **five (05)** preventive security mechanisms to mitigate these threats and support secure platform operations. [40 marks]

- c) Briefly explain the **three (03)** memory exploits that an attacker could be launched. [18 marks]
- d) Assume that you are serving as the Chief Officer for Intellectual Property Enforcement in Sri Lanka, with responsibility for advising and supporting the public on the protection of their creative and innovative works. Mr. Lee, an experienced Java

software developer, has created a software system capable of converting complex academic content such as lecture slides and reference materials into simplified Sinhala text to improve student understanding. He seeks to protect this software-based innovation as his intellectual property.

Advise Mr. Lee on the most appropriate legal mechanism available to protect his software under Sri Lankan law, and provide a reasoned justification as to whether his program qualifies for such protection. [15 marks]

2)

- a) Define the concept of security policies within the field of information security and critically analyze their role in a software product development organization. [19 marks]
- b) Briefly explain the permissive policy and prudent policy. [20 marks]
- c) Develop a comprehensive Email Usage Policy for a Faculty of Technology, outlining the permitted practices, prohibited practices, security and access management and incident reporting associated with institutional email communication. [40 marks]
- d) List the seven layers of the OSI (Open Systems Interconnection) standard communication model. [21 marks]

3)

- a) Briefly define and explain the five (05) components of the cryptosystem. [25 marks]
- b) Discuss how cryptographic mechanisms facilitate confidentiality, data integrity, and authentication in secure communication systems. [21 marks]
- c) Briefly explain the Ciphertext Only Attacks (COA). [10 marks]
- d) You discovered a book in the memorial section of the HSWW Library that is secured with a password.

Following is the encrypted password using by additive Cipher.

"LWJJG QA NZMM".

It was discovered that the encrypted form of the letter "H" is the letter "P".

Determine the original password. [44 marks]

4)

- a) Briefly explain the importance of Intrusion Detection Systems (IDS) and Intrusion Prevention System (IPS) in safeguarding network infrastructures. [20 marks]
- b) Distinguish between vulnerability auditing and penetration testing. [20 marks]
- c) State and briefly explain four (04) methods in vulnerability testing. [32 marks]
- d) A sandbox is an isolated testing environment.
 - i) Explain the reason of using sandboxing in IT organization. [14 marks]
 - ii) Briefly explain how sandboxes are used in following cases.
 - (1) Software protection [7 marks]
 - (2) Security research [7 marks]

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