



UNIVERSITY OF COLOMBO, SRI LANKA

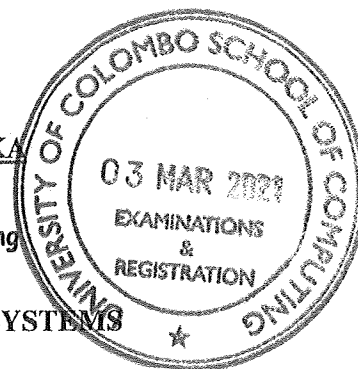
University of Colombo School of Computing

BACHELOR OF SCIENCE IN INFORMATION SYSTEMS

Second Year Examination – Semester II – 2020/2021

IS 2109 – Information Systems Security (Part A)

TWO (2) HOURS (for both parts A & B)



To be completed by the candidate

Examination Index No:

Important Instructions to candidates:

1. The medium of instruction and question is **English**.
2. Write your answers in **English**.
3. If a page or a part of this question paper is not printed, please inform the supervisor immediately.
4. Note that questions appear on both sides of the paper. If a page is not printed, please inform the supervisor immediately.
5. Write your index number on each and every page of the answer paper.
6. This paper has **2** questions in **06** pages.
7. Answer **ALL** questions. Question 01 carries **24 marks** and Question 02 carries **26 marks**.
8. **This paper consists of two parts, Part A (Question No 1 and Question No 2) and Part B (Question No 3 and Question No 4) and submit separately.**
9. Any electronic device capable of storing and retrieving text including electronic dictionaries and mobile phones are not allowed.
10. **Non-Programmable** calculators are **allowed**.

**For Examiner's use
Only**

Question No	Marks
1	
2	
3	
4	
Total	

Part A**Question 1**

(a)

- (i) Confidentiality, Integrity, and Availability are the main three (3) Information Security goals. List another three (3) Information Security goals.

[3 Marks]

- (ii) Briefly explain risks in using an Automated Teller Machine (ATM) and Automated Deposit Machines (ADM).

[6 Marks]

(b) Briefly explain how you are going to implement the following fundamental security design principles in the given context. You are also required to mention the advantages of implementing the respected design principle.

(i) Implementing the principle of **Complete Mediation** in an Automated Teller Machine (ATM).

[5 Marks]

(ii) Implementing the principle of **Separation of Privilege** in the public cloud platform.

[5 Marks]

(iii) Implementing the principle of **Economy of Mechanism** in your group project.

[5 Marks]

Question 2

- (a) Mathematical notations are used to represent a relationship between variables (For example, $+$, $<$, $>$, $=$). Represent the following variables using mathematical notations.

Variables: 'Cost of security', 'Cost of failure', and 'Cost of recovery'.

An Information Manager identified a vulnerability in the information system of the organization. When he requested resources for fixing the vulnerability, he was asked to evaluate whether it is worth to invest that much of resources to fix the given vulnerability. Using the cost of failure and cost of recovery, assist him to evaluate his decision. You can use the mathematical notations.

[5 Marks]

- (b) List four (4) countermeasures that could only reduce the consequences of a security breach.

[4 Marks]

- (c) Using a suitable example, briefly describe the following terms.

Terms: 'Attack', 'Threat', and 'Vulnerability'.

[6 Marks]

- (d)

- (i) Using the length and composition of a password, briefly explain the relationship between **Ease of Use** and **Security**.

[4 Marks]

- (ii) What is the mechanism implemented in Web Browser to achieve both **Ease of Use** and **Security**?

[3 Marks]

- (iii) List one limitation of the security mechanism mentioned and answer to 2 (d) (ii).

[2 Marks]

- (iv) Identify possible measures or product to overcome the limitation mentioned in your answer to 2 (d) (iii)

[2 Marks]
