

ORDRE DES INGÉNIEURS DU QUÉBEC

NOVEMBER 2015 SESSION

Open-book examination
Calculators : only authorized models
Duration : 3 hours

14-LO-A7
Security/Safety

Instructions:

- The answers should be precise and concise
- Assumptions must be clearly stated

Marking scheme:

Question	Grade
Q1	/10
Q2	/8
Q3	/8
Q4	/8
Q5	/8
Q6	/8
Q7	/10
Q8	/8
Q9	/8
Q10	/8
Q11	/8
Q12	/8
Total	/100

Questions:

- Q1. Define computer security. Explain the terms vulnerability, threat, and attack. [10 marks]
- Q2. What is the relationship between software quality and security? How does security fit in the definition of software quality? For example, can an application be insecure and still be of good quality? [8 marks]
- Q3. Humans are said to be the weakest link in any security system. Why? Give an example for a situation in which human failure could lead to a compromise of encrypted data. [8 marks]
- Q4. How does the Public-Key Infrastructure (PKI) work? Illustrate your answer using examples. [8 marks]
- Q5. How do some programming-language features lead to buffer overflow attacks? Illustrate your answer with examples. [8 marks]
- Q6. List four types of malicious code and explain the differences between them. [8 marks]
- Q7. Describe how security testing differs from ordinary functionality testing. What are the criteria for passing a security test that differ from functional criteria? [10 marks]
- Q8. Explain how the Man-in-the-Browser and the Keystroke logger Internet threats work. [8 marks]
- Q9. How does the Layered Design technique in the design of an operating system help make the system more secure. [8 marks]
- Q10. The Wired Equivalent Privacy (WEP) protocol, used in wireless networks, is known to have security weaknesses. Explain these weaknesses. [8 marks]
- Q11. Discuss the main components of a security plan in the context of security management. [8 marks]
- Q12. Do you think that that a separate category for computer crime is needed? Discuss. Why computer crime is hard to define and prosecute? [8 marks]