Høyskolen Kristiania

Subject code:	**TK2100**
Subject name:	**Information Security**
Exam type:	**24-hour home-exam**
Individual qualification:	**Approved / not approved**
Exam deadline:	**June 9th 2023**
File format:	**PDF**

The assignment set consists of 3 pages, and contains a total of 10 tasks to be answered.

There is a 24 hour deadline for this home exam, but the expected workload is 4-6 hours so it is not intended to "work through the night". Please note that the exam MUST be submitted within the deadline set, and must be submitted via the exam platform WISEFLOW. It will not be possible to submit the assignment after the deadline – this means that you should submit well in advance so that you can contact the exam office or support if you have technical problems.

As this is a home exam, it is important to show comprehensive understanding, and the assignments have a greater focus on discussion. Supplementary and explanatory answers to all tasks are therefore expected. You can choose to draw shapes and sketches in the word processor, or by drawing on paper and uploading a picture – remember to insert the picture in the right place in the answer. (Images that are attachments but not inserted in the answer are not considered part of the answer.)

It is emphasized that the student must answer the exam independently and individually, cooperation between students and plagiarism is not allowed. All use of text, images and illustrations taken from lectures, textbooks or the Internet must be accompanied by reference to sources so that it is clearly stated what the student's own work is, APA7 or Chicago (author, year) standards recommended for use for sources. For top scores, the answers should be supported with relevant sources beyond ordinary syllabus literature. (Please note that copying text from a separate previous assignment/exam may be considered "self-plagiarism" if you do not cite yourself correctly as a source.)

It is also emphasized that according to the school's exam regulations, it is not allowed to present someone else's work as your own – this includes work done by artificial intelligence (such as text or code generation models).

The answer should not be more than 15 A4 pages, with font size 12, normal margins and line spacing 1.0.

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Task 1. General (5 %)

Define "information security". Base your answer on the CIA model.

Task 2. Surveillance (15 %)

Discuss how you as an individual are exposed to monitoring and consumption analyses by large international companies, and how this may affect your privacy. Consider how European law is intended to protect your privacy.

Task 3. Malware (10 %)

Explain what a rootkit is. Describe what the purpose of a rootkit is and different techniques a rootkit can use to achieve this.

Task 4. Encryption (15 %)

Explain the difference between asymmetric and symmetric encryption, give at least an example of algorithms for these types.

Explain how a document to be sent between Alice and Bob can be protected both securely and most effectively by combining asymmetric and symmetric encryption.

Task 5. Web security (10 %)

Explain the fundamental differences between Cross Site Scripting (XSS) and Cross Site Request Forgery (CSRF). Briefly explain how the two attacks are carried out.

Task 6. Network (10 %)

Explain what security challenges we have at the network layer in the TCP/IP model.

Task 7. Patent and copy protection (10 %)

Explain how the ownership of a computer program can be protected in Norway, both relevant laws and other protections that may legally or technically protect the work.

Task 8. Home office (10 %)

During the pandemic, remote working became common for most companies and employees with typical "office work". Discuss the challenges this poses for data security in the companies. What do you think needs to change now that working from home becomes the "new normal" to ensure safety?

Task 9. Practical encryption (5 %)

Use OpenSSL on command line and show how to encrypt a file with AES encryption. Document the procedure and result with screenshot, remember and insert the screenshot in the right place in the answer.

Task 10. Practical port scanning (10 %)

Perform a port scan of your own machine using Zenmap or NMap. (If you have a home network owned by you, you can choose to scan one or more other computers on your network instead.) Perform a scan where you test all ports to see what services are running. Explain what the open ports mean. Document the procedure and result with screenshot, remember and insert the screenshot in the right place in the answer.

End of task set.