

ORDRE DES INGÉNIEURS DU QUÉBEC

MAY 2019 SESSION

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

14-IF-A6 GÉNIE LOGICIEL / SOFTWARE ENGINEERING

For each question of this exam, we expect a fully detailed answer. Make sure to provide sufficient details in your answers. More points will be awarded to the understanding demonstrated by the answers than specific elements.

Question 1 (10 points): Consider the categories of software presented in section 1.1.2 in the book *Software engineering* by Roger S. Pressman. Do you think that the same approach to software engineering can be applied for each? Provide examples to illustrate your answer.

Question 2 (10 points): Why does an iterative process make it easier to manage change? Provide and justify three reasons.

Question 3 (10 points): What are the problems with traditional software processes that agile methodologies tried to address? Describe three characteristics of agile methodologies addressing the problems you identified. Justify your answer.

Question 4 (15 points): Use cases are an effective way to elicit requirements for a software project. Describe what is a use case and what is the information it contains, and explain how it can be used in a software process. Identify a potential pitfall of requirement elicitation that can be avoided with use cases and explain why.

Question 5 (10 points): Describe the four types of models (illustrated in figure 6.3 of the book *Software engineering* from Roger S. Pressman) used in analysis modeling.

Question 6 (10 points): Describe three design principles that are useful when designing software and establishing its architecture. Explain how these principles have an impact on the architecture (suggestion: use examples).

Question 7 (10 points): Provide a definition of software quality. Identify two software engineering practices that increase software quality and justify your answer. Describe the relationship between software process and quality.

Question 8 (10 points): You are named the configuration manager of a large software development project. What types of processes and tools must you put in place? What are the tasks you must perform during a project?

Question 9 (15 points): Risk management is an essential activity of project management. First, describe the steps of a proactive risk strategy. Second, discuss the relationship between software metrics and risk management. Finally, identify the three main risk categories and some metrics that can be associated to each category.