

## **TIE-21307 Large scale software design**

**8.5.2019**

The examination is made and graded by Hannu-Matti Järvinen.

**During the examination, you may not use written materials, calculators or computers. You may answer either in English or in Finnish.**

- 1) Describe shortly the idea of the following concepts (one or two sentences per point)
  - a) Product family (2p)
  - b) Software architecture (2p)
  - c) Overlay network (context: peer-to-peer systems) (2p)
- 2) Software component (6p)

The material discussed component interaction management. Why is this so important, i.e., what kind of problems may arise (you may use an example to describe the problems)? What is the main goal in interaction management? Give (at least) three ideas or methods to manage the interactions.
- 3) Interpreter architectural style (6p)

Describe the idea of an interpreter architectural style. Give an example where this kind of architecture is used or could be used. What the strengths and weaknesses of the interpreter architecture?

ELT-23056 Embedded Systems and Electronics Productization  
Exam 7.5.2019

During this exam you will go through project planning of an imaginary design project. There will be many tasks so you have to work rapidly. It is not important how tidy and professional your documents look, the contents matters.

The idea is to repeat the work done during the spring assignments i.e. to prepare a project plan:

A company ELT-IX inc. has a problem and hires your team to solve it. The company wants to have a small device that can store messages replacing the notes on the door of a refrigerator.

Your task now is to:

1. refine the idea and write a requirements document
2. prepare a presentation for HNABCS –pitch (hook, need, approach, benefits, competition, summary)
3. based on the user requirements and your approach in the pitch, draft a project implementation plan
  - Divide the product into smaller modules, submodules, components, software components, user interfaces, user instructions, documentation, etc.
  - Assign activities (tasks) to each (sub-sub-)product
  - Collect related activities into work packages
4. estimate person months for each activity
5. draw a GANTT-chart
6. make risk analysis and list the risks and the contingency plans
7. prepare a test plan (actually, explain the procedure as we do not have a specific target to review)
8. finally, think what intellectual property could be worth protecting and draft a claim

1. ~~responsibilities~~ responsibilities and requirements (skills) of customer, product owner and scrum master in scrum. 4p.
2. two reasons to failures in software  
(choose two from multiple answers) 1p.
3. Describe three agile methods and when they would suitable for use. 2p.
4. "critical difference" between generic product development and custom software development (or something :D) 2p.
5. "contractual problem" in agile. Explain and tell about the conclusion which was presented on lectures. 2p.
6. 10 "software process attribute", explain and tell about two of the three inverse relations between them. 4p.
7. 2p.
8. Quality control steps during a project. You are doing a system for insurance company (no critical security needs), what quality measures would you establish and what quality method would you use. 3p.
9. ISO 25010 has eight quality characteristics, List four and their sub-categories. What would you use as a metric for each? 4p.