

PRIFYSGOL ABERYSTWYTH - ABERYSTWYTH UNIVERSITY

DEGREE EXAMINATIONS 2013-2014 SEMESTER 1

INSTITUTE OF MATHEMATICS, PHYSICS AND COMPUTER SCIENCE

Computer Science, CS31310: Agile Methodologies

Time allowed: 2 hours

Calculators are not allowed in this examination.

*Answer **THREE** from **FIVE** questions.*

All questions carry equal marks.

1. One of your colleague makes a statement: *“Refactoring is little more than an excuse for not taking time to create a proper design.”*

Discuss this statement with respect to agile software projects. In your discussion, you should consider the following points.

- a) Explain what is meant by the term *refactoring*. [6 marks]
- b) Consider the use of refactoring with other agile software development practices to develop a design, for example, but not limited to, pair programming and test driven development. [15]
- c) Discuss possible risks to project development if such a technique is not used effectively. [12]

2. This question concerns AntiPatterns and Feature Driven Development.

- a) A software design pattern describes a problem and a good design solution that helps software developers resolve recurring problems. What does an AntiPattern describe? [3]
- b) Give the Name, Background, Alternative Name(s) and General Form of
 - one Software Development AntiPattern,
 - one Software Architecture AntiPattern and
 - one Management AntiPattern.[12]
- c) A project is following the Feature Driven Development process. Many of the features are complete, but several are behind schedule. The feature teams responsible for the features that are behind schedule all include one particular class owner, and all the classes owned by that class owner have a very similar combination of instance variables and methods. It should be added that a similar class, with the same class owner, has already proved its worth as an effective element of several of the completed features. Identify AntiPatterns that might give rise to these symptoms, and suggest remedies to improve the project. [18]

3. *Cambrian Coast Insurance* develops in-house software solutions to support its business operations. It has traditionally followed a plan-based methodology to develop software systems. The company is planning to use Extreme Programming (XP) for a project to develop a new insurance claims system.

You are asked to introduce XP to Cambrian Coast Insurance by completing the following tasks.

- a) Explain how project planning is performed in Extreme Programming. In your answer, you should discuss the main stages of planning in XP and the people that are involved in those stages.

[15]

- b) The company will need to select an appropriate customer to work on the project. The management has proposed that a member of the insurance claim processing team can allocate two days a week to the project. Discuss the responsibilities that the customer should expect to take on and whether the proposed person is suitable for this role.

[12]

- c) The company uses formal code reviews as part of its existing development process. Discuss how XP manages the process of code reviews and identify one advantage and one disadvantage of this approach.

[6]

4. This question is about software testing using *Test Driven Development*.

- a) If your project is using Extreme Programming, state and explain the purpose of the two general types of testing that you would expect to be prepared for this task. In your answer, identify who is responsible for specifying the tests.

[6]

- b) You are working on a project to develop a new application that manages concert ticket sales. You have been presented with the following task description:

Make a list data structure that can hold information about concerts that match certain search criteria. The concerts in the list should be ordered by date, with the earliest dates at the start of the list. An example search query is concerts that are in Aberystwyth between May and June 2014.

Based on the above task description, describe and provide rationale for the steps you would follow if implementing the List using the Test Driven Development process. Make sure that you describe *three* tests and how you would implement the tests and the application code iteratively. You do not need to write syntactically correct code; a text description or pseudo code is acceptable.

[18]

- c) XP projects use tests and source code as the main form of documentation. Discuss the strengths and weaknesses of this approach and explain whether or not you agree that tests and code are a good form of documentation. [9]

5. This question concerns Feature Driven Development (FDD).

a) The five processes of feature driven development are:

- Develop an overall model
- Build a features list
- Plan by feature
- The pair of repeated processes:
 - Design by feature
 - Build by feature

Briefly describe the result of each of these five processes. Your description should cover the artifacts – diagrams, planning documents and so forth – produced by each process, and should identify the team member(s) responsible for accepting the results of each process. [15]

b) The Super Software Corporation (SSC) has for many years been a highly respected supplier of large bespoke software systems. SSC uses a waterfall-based software engineering process, and the company has recorded consistently excellent performance in requirements engineering, testing, change management and general project management. However, over the years, problems have been observed in detailed software design and coding, and very occasionally in the overall system architecture. However, the company will soon undertake development of a substantial web application using Feature Driven Development (FDD). The developers have been trained in FDD and are keen to put their training into practice in the new project. Describe how SSC could make use of its existing processes for requirements and testing within FDD. Indicate any adaptations that might need to be made to the existing requirements and testing processes. Point out potential benefits and problems. [18]