Galway-Mayo Institute of Technology

Semester 2 Examinations 2018/2019

MODULE: COMP 08013 – Software Engineering

PROGRAMME(S):

GA_KSOAG_H08   BACHELOR OF SCIENCE (HONOURS) IN COMPUTING
IN SOFTWARE DEVELOPMENT

YEAR(S) OF STUDY: 4

EXAMINERS:

Dr. John French	(Internal)
Mr. Tom Davis	(External)
Dr. Des Chambers	(External)

TIME ALLOWED: 2 hours

INSTRUCTIONS: **Answer 3 questions. All questions carry equal marks.**

Please do not turn this page until you are instructed to do so.

The use of programmable or text storing calculators is expressly forbidden. Please note that where a candidate answers more than the required number of questions, the examiner will mark all questions attempted and then select the highest scoring ones.

There are no additional requirements for this paper.

Question 1 (100 marks)

    (a) In Agile development, requirements are captured in terms of User Stories. The attributes of a well-written user story can be summarised by the acronym SMART. Explain what a SMART user story is.   (40 marks)

    (b) In light of the above, consider each of the following user stories for a new music streaming service you're developing called Tuneify. Describe any flaws these stories have and explain how they might be improved, giving an example.   (30 marks)

        (i) Tuneify should have a responsive user interface

       (ii) As a user, I should be able to easily find new music on Tuneify

    (c) Explain how the Cucumber tool is used in Behaviour-Driven Design (BDD).   (30 marks)

Question 2 (100 marks)

    (a) Discuss some important qualities of good automated tests.   (40 marks)

    (b) When writing automated tests, developers frequently make use of test doubles. Explain what test doubles are and why they are useful.   (30 marks)

    (c) Describe the role that unit, functional and integration tests play in an automated testing strategy.

        (30 marks)

Question 3 (100 marks)

(a) In the context of web applications, briefly explain what is meant by the following:

(50 marks)

  – Client-Server architecture

  – HTTP is a stateless protocol

  – Scalability

  – ReST API

  – Service-Oriented Architecture

(b) Developers make extensive use of frameworks like Ruby on Rails in developing applications, particularly for the web. Explain what a framework is, and discuss some of the pros and cons of using frameworks. (25 marks)

(c) Ruby on Rails uses the MVC architecture. Explain the role of the 3 main components in this architecture. (25 marks)

Question 4 (100 marks)

A major customer of your organisation is using an old product which is built from legacy code. They have requested that a new feature be added, and your manager has asked you to make the required changes to the legacy code, which, unfortunately, has very few tests.

(a) Two possible approaches to this task can be called the *Edit and Pray* approach and the *Cover and Modify* approach. Discuss these possible approaches. (30 marks)

(b) When exploring the legacy code it becomes clear that some of it needs to be refactored. Explain what is meant by refactoring and discuss some of the reasons why code may need to be refactored. (40 marks)

(c) Briefly explain the four main types of software maintenance. Which type of maintenance did your manager ask you to carry out in the hypothetical task above? (30 marks)