



INSTITUTE OF TECHNOLOGY TRALEE

WINTER EXAMINATIONS AY 2014-2015

Software Engineering

**Module Code SWEN61000
CRN 43842**

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Duration: 2 Hours

Instructions to Candidates: This paper contains four questions. Answer any *three* questions.

Question 1 [30 Marks]

- (a) Outline the process activities which are common to all software process models. (6 marks)
- (b) Explain how the application of process activities differs in the Waterfall process model and the Iterative process model (4 marks)
- (c) Discuss the following principles of the Agile Manifesto and the difficulties that might be encountered when implementing these principles: (10 marks)
- Customer involvement
 - Incremental delivery
 - People not process
 - Embracing change
 - Maintain simplicity
- (d) Describe the main features of the Scrum framework and its application as an agile methodology. (10 marks)

Your answer should make reference to:

- Scrum roles
- Scrum artefacts
- Scrum meetings

Question 2 [30 Marks]

- (a) What is **requirements analysis** and how do *user* requirements differ from *system* requirements? (5 marks)
- (b) Describe the role of an **activity diagram** in system requirements specification. Give an example to illustrate your answer. (5 marks)
- (c) Use Case Modelling is a methodology commonly used for requirements specification. (15 marks)
Give a detailed description of the following components of use case modelling:
- Use case diagram
 - Use case narrative
- (d) “*The requirements specification for a software system has a range of target readers*”. Who are these target readers and what do they contribute to the software development process? (5 marks)

Question 3 [30 Marks]

- (a) Describe, in detail, Data Flow Diagrams as a system modelling technique. (8 marks)
- (b) A small tool hire business has decided to automate its day-to-day administration. The analyst has conducted a preliminary requirements elicitation and has identified three main components for the proposed system: *Tools*, *Customers* and *Rentals*. Furthermore, each rental can consist of one or more tools.
- Identify and discuss **two essential** functional requirements for **each** component of the system. Identify and describe **three** non-essential functions which you feel the stakeholders might require.
Summarise the functional requirements identified as a set of abstract User Requirement. (4 marks)
- (c) Using the user requirements listed in (b) above: (18 marks)
- (i) Show the functional components of the system as a hierarchy chart.
 - (ii) List the *external entities*, *data stores* and *processes* required to implement the above system.
 - (iii) Draw a Level-0 and Level-1 DFD for the proposed system.
 - (iv) Draw a Level-2 DFD for **one** module of the proposed system
 - (v) Give comprehensive file structures for any data stores in the proposed system.

Question 4 [30 Marks]

- (a) What are the objectives of software testing? **(3 marks)**
- (b) Explain, using examples, the difference between syntax, semantic and run-time errors. **(3 marks)**
- (c) Describe the processes of *White box testing* and *Black box testing*. **(10 marks)**
What are the benefits and/or disadvantages of both approaches to testing?
- (d) Describe the following test strategies typically used in software testing: **(8 marks)**
- Unit test
 - Component test
 - Integration test
 - System test
 - Acceptance test
 - Regression test
 - Volume
 - Stress test
- (b) Describe *Test Cases* and the role they play in the in the software testing process. **(6 marks)**