INSTITUTE OF TECHNOLOGY TRALEE

WINTER EXAMINATIONS AY 2014-2015

Software Engineering

Module Code SWDV81011
CRN 45212

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Internal Examiner(s):   Ms. Catherine Woods

Duration: 2 Hours

Instructions to Candidates: This paper contains four questions. Answer any *three* questions.
                                  Pencil is permitted for use in this exam.

Question 1 [30 Marks]

(a) What is *requirements analysis* and what components are typically found in a requirements specification. **(5 marks)**

(b) Use Case Modelling is a methodology commonly used for requirements specification. **(10 marks)**
Describe the following components of use case modelling:
- Use case diagram
- Activity diagram
- Use case narrative

(c) Describe the main features of the *Scrum* and its application as an agile methodology. **(15 marks)**
Your answer should make reference to:
- Scrum roles
- Scrum artefacts
- Scrum meetings

Question 2 [30 Marks]

(a) Discuss the human factors which have led to a set of general UI design principles. **(15 marks)**

(b) Describe the different ways in which information can be presented on an interactive **(10 marks)**
user interface. Your answer should make reference to the presentation of textual, graphical, dynamic and static information.

(c) *"Prototyping is an effective process for evaluating a user interface"*. Discuss. **(5 marks)**

Question 3 [30 Marks]

(a) Describe, in detail, Data Flow Diagrams as a logical 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

(e) Describe *Test Cases* and the role they play in the in the software testing process. **(6 marks)**