INSTITUTE OF TECHNOLOGY TRALEE

WINTER EXAMINATIONS AY 2016-2017

Software Engineering

Module Code SWEN61000
CRN 43842

External Examiner(s): Mr. Terry McSweeney

Internal Examiner(s): Ms. Catherine Woods

Duration: 2 Hours

Instructions to Candidates: Answer any ***three*** questions.

Question 1: [40 marks]

(a) What is ***requirements engineering***? **(2 marks)**

(b) Explain, using examples, the difference between *functional*, *non-functional* and *domain* requirements. **(6 marks)**

(c) Describe briefly *three* methods of *requirements elicitation*. Compare the effectiveness of each method. **(4 marks)**

(d) Why is *requirements specification* such a critical activity in the software development process? **(4 marks)**

(e) *"Functional requirements are specified at two levels of abstraction"*. Discuss the meaning of this statement. **(6 marks)**

(f) Discuss the benefits of the UML activity diagram in the requirements specification process. **(8 marks)**

(g) Describe in detail ***Use Case Modelling*** as a means of requirements specification. **(10 marks)**

Question 2: [40 marks]

(a) Describe in detail how the Waterfall process model differs from an Iterative approach to software development. **(10 marks)**

(b) Outline the values and principles expressed in the Agile Manifesto. **(10 marks)**

(b) In relation to the ***Scrum*** framework, describe in detail: **(15 marks)**

- Scrum roles and responsibilities
- Scrum artefacts
- Scrum meetings

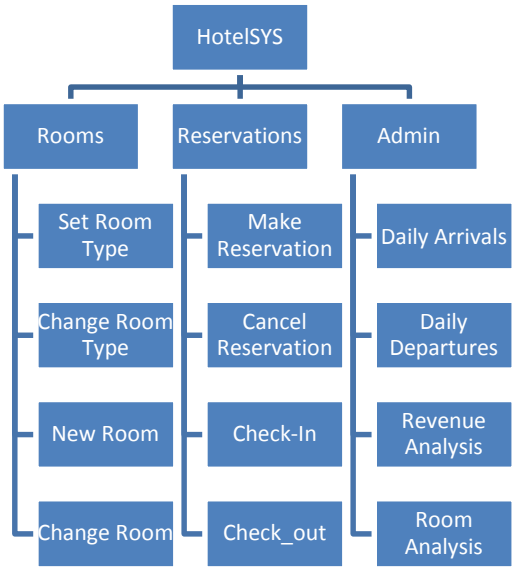
(c) What factors influence the velocity of a Scrum team? **(5 marks)**

Question 3: **[40 marks]**

(a) Describe the elements found on a Gane & Sarson Data Flow Diagram. **(6 marks)**

(b) Using an example, show how DFDs are exploded to different levels of detail. **(4 marks)**

(c) Given the functional components of the system shown below:



i. What External entities and data stores would you identify in the system? **(2 marks)**
ii. Draw a level-0 DFD to represent the above system **(2 marks)**
iii. Draw a level-1 DFD to represent the above system **(7 marks)**
iv. Draw a level-2 DFD for the Reservations module **(4 marks)**

(d) An investment has a development cost of €78,000. Annual benefits have been estimated to be €24,250. Given an investment period of five years and an interest rate of 1.5%:

i. Show the table of benefits and present values for the investment **(8 marks)**
ii. Determine the Payback Period for the investment **(3 marks)**
iii. What is the NPV of the investment? **(2 marks)**
iv. Is this a good investment? Justify your answer. **(2 marks)**

Question 4: **[40 marks]**

(a) What is software testing and what are its objectives? **(2 marks)**

(b) Distinguish between *syntax*, *semantic* and *run-time* errors. Give examples. **(6 marks)**

(c) Explain clearly how Black-box testing differs from White-box testing. **(8 marks)**

(d) What is a test case and what does it document? **(6 marks)**

(e) What is a ***unit test*** and who is responsible for unit testing? **(4 marks)**

(f) What is a ***regression test*** and when is a regression test required? **(4 marks)**

(g) Describe the different test strategies applied in the testing of software systems. **(10 marks)**