INSTITUTE OF TECHNOLOGY TRALEE

WINTER EXAMINATIONS AY 2016-2017

Software Engineering

**Module Code SWDV81011
CRN 45212**

External Examiner: Mr**.** Sean McHugh
Internal Examiner: Ms Catherine Woods

Duration: 2 Hours

Instructions to Candidates: There are four questions on this paper. Answer any *three* questions.
All questions carry equal marks

Question 1 (30 marks)

(a) Discuss the phases, activities and benefits of the *Waterfall* process model.   (10 marks)

(b) How do agile methods differ to the waterfall approach to software development?   (5 marks)

(c) Describe the *Scrum* methodology as an agile approach to software development.   (10 marks)

(d) Describe the selection methods which might be used and the issues to be considered   (5 marks)
when selecting staff for a project team. What, in your opinion, are the factors which
influence this selection?

Question 2 (30 marks)

(a)   Describe Data Flow Diagrams as a logical modelling technique.   (5 marks)

(b)   A Regional library has decided to install a computerised system to handle day to day   (10 marks)
administration. The analyst has conducted a preliminary requirements elicitation and
has identified three main components for the proposed system: *Members*, *Books* and *Loans*.

Identify and *briefly* explain the *essential* functional requirements which you feel the system
must provide and **three *non-essential*** functions which you feel the system might provide.

Summarise the functional requirements discussed as a set of *User Requirements*.

(c) Using the user requirements listed in (b) above: (15 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 any required Level-2 DFDs for the proposed system

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Question 3 (30 marks)

(a)   Outline the objectives of software testing and describe the different test strategies   (8 marks)
typically used in software testing.

(b)   Discuss the human factors which have led to a set of general UI design principles.   (8 marks)

(c)   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.

(d)   *"Prototyping is an effective process for evaluating a user interface"*. Discuss.   (4 marks)

Question 4 (30 marks)

(a)   What is *UML* and what role does this methodology play in the software design   (5 marks)
process?

(b)   Using examples, explain the function of the following UML artifacts: (10 marks)

(i)   Use Case diagram
(ii)   Use Case narrative
(iii)   Activity diagram

(c)   Describe the function and components of a UML *Class* diagram.   (10 marks)
Illustrate your answer with an example of a class diagram which includes references
to association, aggregation and generalisation.

(d)   What is meant by the **multiplicity** of a relationship between classes?   (5 marks)
Use examples to illustrate the different multiplicities which might exist.