RW228/203

DUBLIN INSTITUTE OF TECHNOLOGY

BSc. (Honours) Degree in Computer Science (DT228)

BSc. Degree International in Computer Science (DT282)

Year 2

SUPPLEMENTAL EXAMINATIONS 2016/2017

SOFTWARE ENGINEERING 1

INTERNAL EXAMINERS
MR RICHARD LAWLOR
DR. DEIRDRE LILLIS

EXTERNAL EXAMINER
Mr P Collins

XXTH AUG/SEP
XX.XX A.M. – XX.XX A.M.

2 HOURS

INSTRUCTIONS TO CANDIDATES
ANSWER **FOUR** QUESTIONS OUT OF **FIVE**.
ALL QUESTIONS CARRY EQUAL MARKS.

1. (a) What is a use-case?
List three significant advantages and a potential disadvantage in using use-cases.

(10 marks)

(b) Mention two other roles use-cases may have besides requirements description.

(5 marks)

(c) Explain both the meaning and purpose of a use-case realisation.

(10 marks)

2. (a) Explain and distinguish between *Top Down* and *Bottom Up Design*. Which programming paradigm tends to correspond with each design approach?

(13 marks)

(b) Elaborate on how object-oriented programming addresses the design concerns of coupling and cohesion.

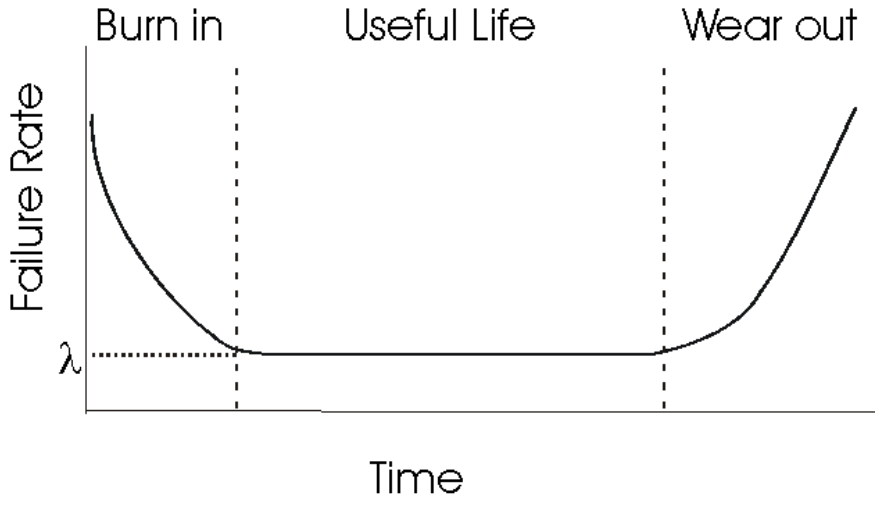
(12 marks)

3. (a) Explain what is meant by Formal Specification and Verification and describe a significant advantage of each. Mention a disadvantage that applies to both.

Mention two situations where this approach to software development would be suitable.

(15 marks)

(b) Given the following diagram which shows hardware reliability over time, draw similar diagrams which express software reliability for both the idealised and the actual situations. Comment on the shape of the curves drawn and why they differ from the hardware curve below.



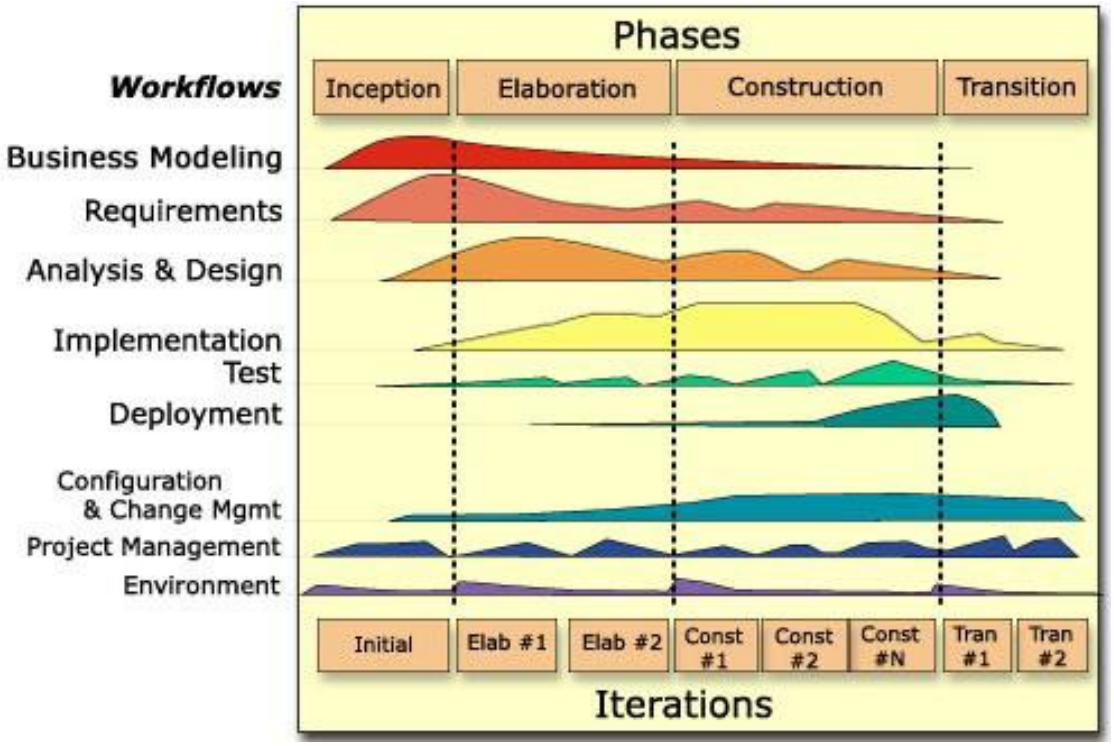
(10 marks)

4. (a) Describe the four phases of the Unified Process (UP) paying particular attention to the Elaboration and Construction phases.

(13 marks)

(b) Mention four ways in which the UP differs from the Waterfall process model. The diagram below may help you.

(12 marks)



5. (a) Discuss the UML terms **generalisation** and **realisation**; and the related Java terms **extends** and **implements**.

Describe two distinct purposes for which class inheritance can be used in OOP.

(8 marks)

(b) Explain what is meant by use-case realisation and how the USE CASE tool can help with this.

(7 marks)

(c) Write a USE model for a Library system paying particular attention to operations necessary for the use-case "*borrow a book*".
Provide some additional SOIL commands for creating objects and linking them to test this model.

(10 marks)