CMPH 2019

W228/203

DUBLIN INSTITUTE OF TECHNOLOGY
KEVIN STREET DUBLIN 8

BSc (Honours) Degree in Computer Science

Year 2

Semester 1

Examinations 2013/2014

Software Engineering 1

Internal Examiners
Mr R Lawlor
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External Examiner
Mr P Collins

Tuesday
7th Jan 2014
4.00 – 6.00 pm

Exam duration: 2 hours

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.

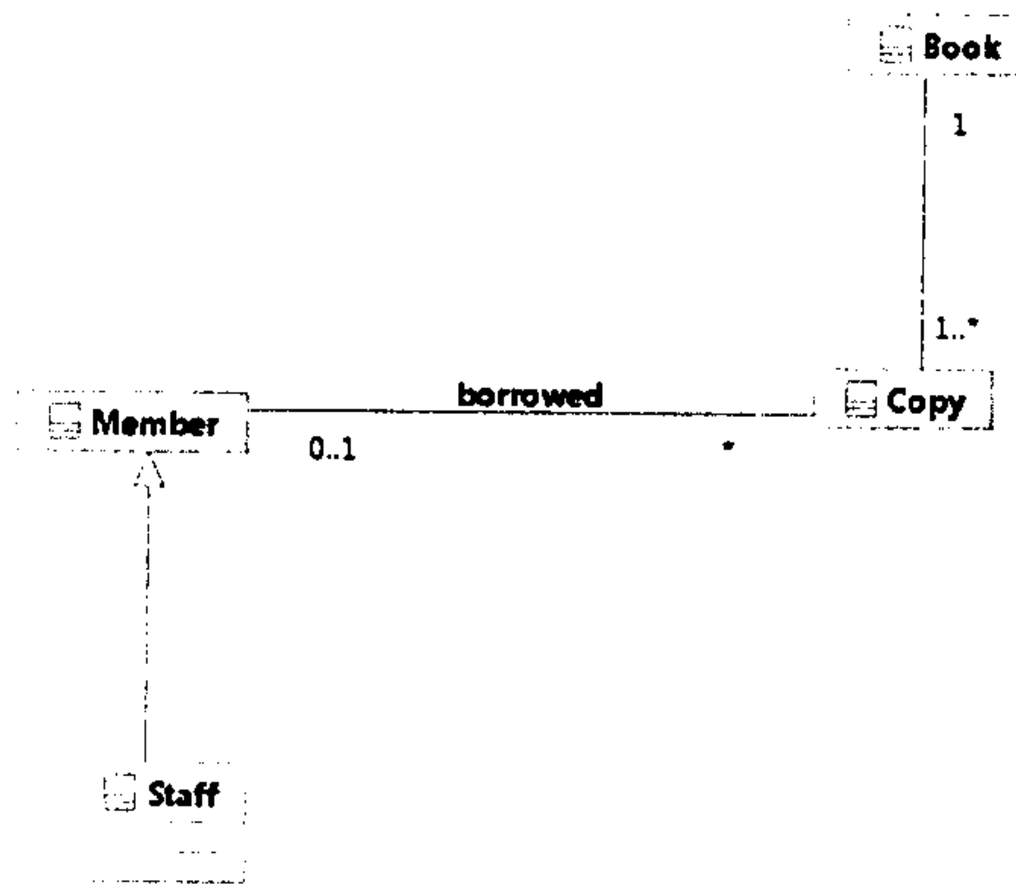
(5 marks)

(c) Provide an example use-case diagram(s) for some requirements which incorporates the <<extends>> and <<includes>> relationships.

What does <<extends>> do and why would it be used in the elaboration or construction phases?

(10 marks)

2. (a) Given the following class diagram for a Library software system, modify it so that library members can also reserve books. Comment on your modification.



(10 marks)

(b) Draw sequence diagrams which show the object interactions when:

1. A library member reserves a book
2. A book is returned by a borrower and there is a reservation queue associated with the book.

(15 marks)

3. (a) Outline the stages of the *waterfall* process model and then discuss the major problems associated with it.

Is the waterfall process model suitable for any type of software development?

(15 marks)

(b) Comment on four aspects in which *Iterative and Incremental* processes can help overcome some of the issues connected with the waterfall process.

(10 marks)

4. (a) Explain what is meant by Formal Specification and outline three of its advantages and one disadvantage.

(10 marks)

(b) Using Z, specify some of the requirements for software which maintains a telephone directory for group of people such as an academic department. Your specification should include the operations:

- assigning a telephone number to a member
- looking up a member's number(s)
- removing a member from the directory.

Comment on significant aspects of each schema.

(15 marks)

5. (a) Briefly explain what is meant by the terms *modularity, cohesion* and *coupling* within the context of software design and programming and then discuss their relevance. How do they relate to Object-oriented concepts like: classes/object, data hiding and encapsulation?

(16 marks)

(b) Describe three types of coupling.

(9 marks)