



University College Dublin
An Coláiste Ollscoile, Baile Átha Cliath

SEMESTER 2 EXAMINATION – 2014/2015

COMP 30160

Object-Oriented Design

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Time Allowed: 2 hours

Instructions for candidates

Question 1 carries 20 marks. Questions 2-6 carry 10 marks each.

Attempt any set of questions such that the total number of marks for the attempted questions is 50.

Question 1

Write an account of the Unified Process and Agile Processes, and describe how these processes are applied in current software development practice.

(20 marks)

Question 2

For each of the three UML diagram types *use case diagram*, *class diagram*, and *interaction diagram*, describe the essential notation briefly and explain what the diagram is used for in designing a software system. Describe how the different diagram types are related to one another.

(10 marks)

Question 3

Describe Test-Driven Development (TDD) from a software developer's perspective. In the context of code coverage, explain modified condition/decision coverage. How does TDD aim to achieve code coverage?

(10 marks)

Question 4

Describe the *Dependency Inversion Principle* and explain its importance. Show how a direct dependency between classes can be inverted, again explaining your example.

(10 marks)

Question 5

In relation to any design pattern with which you are familiar, answer the following.

- (i) What is the intent of the pattern?
- (ii) Using the appropriate UML diagrams, describe the typical structure and interactions of the pattern.
- (iii) Describe three issues related to the applicability or implementation of this pattern.

(10 marks)

Question 6

For each of the three code smells listed below, (i) describe the code smell (ii) suggest how this smell can come about in practice and (iii) outline the refactorings you might perform in order to remove the smell.

- (i) Feature Envy
- (ii) Duplicated Code
- (iii) Refused Bequest

(10 marks)