Semester two of academic year (2015—2016) of BJUT

Object Oriented Design

COMP3013J

Exam Instructions: Answer part 1 and any other 3 parts

Honesty Pledge:

I have read and clearly understand the Examination Rules of Beijing University of Technology and University College Dublin and am aware of the Punishment for Violating the Rules of Beijing University of Technology and University College Dublin. I hereby promise to abide by the relevant rules and regulations by not giving or receiving any help during the exam. If caught violating the rules, I would accept the punishment thereof.

Pledger:_____ Class No:_____
BJUT Student ID:_____ UCD Student ID:_____

Notes:

The exam paper has 5 parts on 4 pages, with a full score of 100 points. You are required to use the given Examination Book only.

Instructions for Invigilators:

Candidates are allowed to use non-programmable calculators during this examination.

Obtained Score

Part: 1 Short Questions

a. What happens in the Elaboration phase of the Unified Process?
(5 Points)

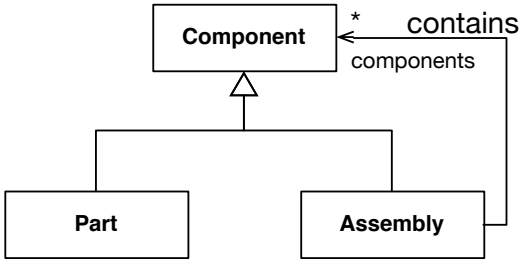
b. Distinguish between boundary, control and entity objects in the context of the Unified Process.
(5 Points)

c. What is cohesion? Why is it important that a class be cohesive?
(5 Points)

d. Explain the 'Liskov substitution principle'.
(5 Points)

e. Explain what is meant by object identity. Describe how object identity is implemented in most object-oriented programming languages. Describe how can this identity be realised in persistent storage. Explain the difference between the two implementations. **(5 Points)**

f. What type of object structure is denoted by the following class diagram? Why might aggregation be more appropriate?



(5 Points)

g. Explain the 'no concrete superclass' principle.
(5 Points)

h. Explain the includes and extends relationships in use case modelling.
(5 Points)

(Total 40 Points)

Obtained Score

Part: 2 Methodology

a. Describe the spiral model of software development.

(6 Points)

b. List and describe briefly the 4 quadrants of the spiral model.

(7 Points)

c. How does the spiral model compare to the waterfall model. Describe this comparison in terms of the risk of the project.

(7 Points)

(Total 20 Points)

Obtained Score

Part: 3 Architecture

a. What is an application framework? Explain the inversion of control principle in this context.

(10 Points)

b. Describe the layered architecture. What are the benefits of this architecture?

(10 Points)
(Total 20 Points)

Obtained Score

Part: 4 Modelling

a. List the five views of UML. Describe the purpose of each view and who the view is of interest to.

(10 Points)

b. Describe the concept of data storage in an OOP program when compared to data in traditional procedural programs. Illustrate your example with an object diagram.

(10 Points)
(Total 20 Points)

Obtained Score

Part: 5 Implementation

a. Dependencies impose constraints on the order in which components can be created and tested. Describe the two basic approaches to this. What are the advantages and disadvantages of each approach.

(10 Points)

b. Describe an alternative approach to choosing the order in which components are created and constructed.

(10 Points)

(Total 20 Points)