



# Beijing-Dublin International College



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**SEMESTER 1 FINAL EXAMINATION - 2019/2020**

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**COMP3017J Software Methodology**

**MODULE COORDINATOR: Zhenyan Ji**

**Time Allowed: 90 minutes**

**Instructions for Candidates**

**BJUT Student ID:** \_\_\_\_\_ **UCD Student ID:** \_\_\_\_\_

I have read and clearly understand the Examination Rules of both Beijing University of Technology and University College Dublin. I am aware of the Punishment for Violating the Rules of Beijing University of Technology and/or 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 accept the punishment thereof.

**Honesty Pledge:** \_\_\_\_\_ **(Signature)**

## **Instructions for Invigilators**

All electronic devices, notebooks, books, work papers are strictly prohibited.

### Section I True Or False (1 point for each question, 10 points in total).

- ( ) 1. Waterfall method contains feedback loops.
- ( ) 2. Use case diagram is used to describe functional requirements.
- ( ) 3. An actor can be a person, a device, or an external software system that communicates with the system.
- ( ) 4. Both Scrum and Extreme Programming are agile methods.
- ( ) 5. During a sprint of scrum, requirements can change.
- ( ) 6. Non-functional requirements are not as important as functional requirements.
- ( ) 7. Microservices can only be developed in the same programming language.
- ( ) 8. White-box testing explores input space of functionality defined by an interface specification.
- ( ) 9. Low coupling and high cohesion means better modifiability.
- ( ) 10. A work product becomes a baseline only after it is reviewed and approved.

### Section II Answer the questions in brief. (50 points in total)

1. (5 points) What phases are included in waterfall method? List them in order.
2. (5 points) What is the agile manifesto?
3. (5 points) What are the software configuration items?
4. (7 points) fill in the seven blank squares in Fig.1 with different kinds of testing.

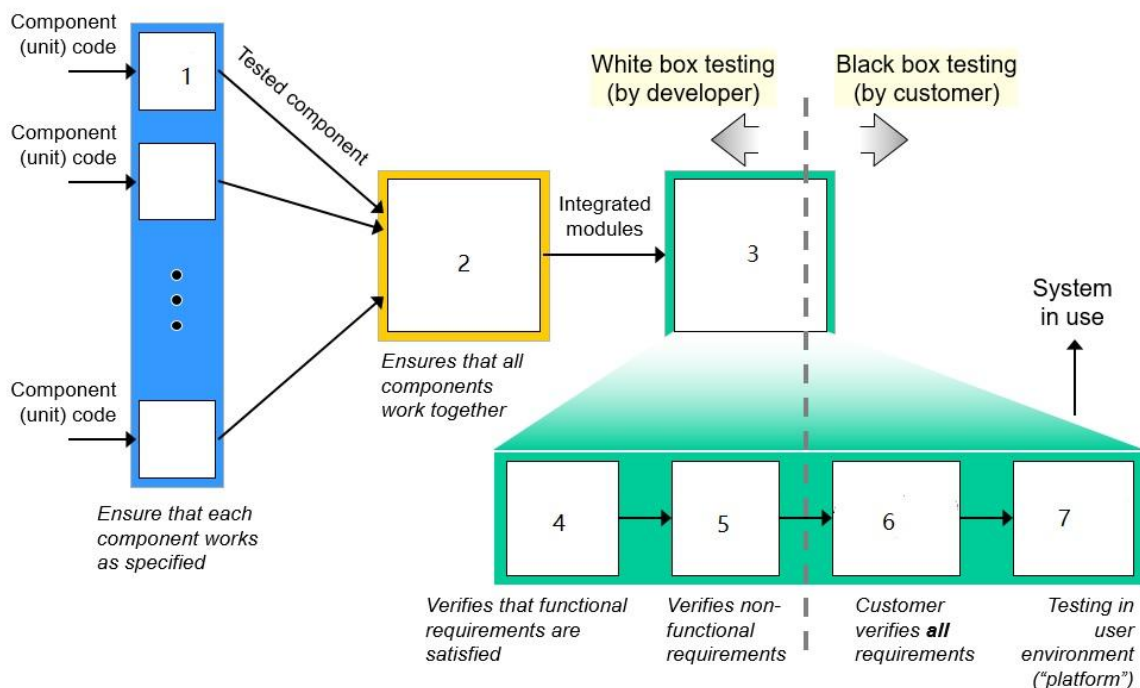


Fig 1 Testing

5. (5 points) Why is scalability often overlooked?
6. (10 points) Tell the differences between Microservice architecture and Monolithic architecture. Why is Microservice architecture better than Monolithic architecture?
7. (8 points) An online book store has the following features,
  - a) Book list – can list books by categories. When a book is selected, the detailed information about the book is displayed.
  - b) Book Detail - Customers can quickly see book pricing, quantity, and other detailed information when a book is selected.
  - c) Shopping Cart - allows customers to browse through the online book store and quickly build an order. The books in the shopping cart can be added, listed and removed.
  - d) Payment with different Credit Card - allows a customer to pay his order with different credit cards.
  - e) Saved Personal Info - allows customer to add all their personal info into the system, and save for future use.
  - f) Searching- allows customer to search books in different ways, by book name, book ISBN or book authors.
  - g) Get alerts-A customer can subscribe and receive timely SMS and email message from the online bookstore about any price adjustment of books.

Task: Based on the features, create the product backlog for the online book store system (i.e. write user stories).

8. (5 points) Explain the meaning of **Usability** and briefly provide at least THREE solutions to improve **Usability**.

**Section III (40 points in total). Analyze the following system requirements and answer the questions.**

Nowadays there are many online stores such as JingDong, Taobao, Amazon and so on. They bring a customer great convenience to do shopping. The following is simplified requirements for an online store.

Requirements:

- A customer can browse different goods.
- A customer can search the online store by keywords.
- A customer can filter goods by price, manufacturer, categories and so on.
- A customer can add goods to shopping cart. The user can view and modify the shopping

list.

- A customer can pay a bill by a credit card, ali-pay, wechat-pay, or paypal.
- A customer should feel confident that their personal information will be protected and the payment is secure.
- The store provides special offers like order discounts, coupon codes, and free shipping. The offers can be combined. The special offers can encourage customers to take advantage of a "good deal".

Tasks:

- i. (10 points) Draw Use Case diagram based on the requirements.
- ii. (8 points) what architectural style/pattern can be used to design the system? Tell the reason for you to select the architecture style.
- iii. (12 points) draw the architecture diagram for the system. The architecture diagram should embody modules and the relationships between modules.
- iv. (10 points) Based on the requirements, what quality attribute should be considered? Tell the solutions to meet the quality attribute.