



Beijing-Dublin International College



SEMESTER 1 FINAL EXAMINATION - (2020/2021)

School of Computer Science

COMP2011J Object Oriented Programming

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Time Allowed: 60 minutes

Instructions for Candidates:

Answer **All** questions.

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

Non-programmable calculators are permitted.

No rough-work paper is to be provided for candidates.

Question 1:

- a. Given the variables listed below, calculate the **type** of data that would be returned as the result of each of the following expressions? Explain each of your answers.

- An int named `i`

- A short named `s`

- A float named `f`

- A long named `l`

- A String named `t`

- A double named `d`

(i) `i + d`

(iii) `i / s`

(v) `s < i`

(ii) `l - i * s`

(iv) `l + i + t`

(10%)

- b. Explain the difference between the following pieces of code (Assuming `s` is a `String` variable). Will they **always** return the same result? Why?

```
1 s == "Hello"
```

(a)

```
1 s.equals("Hello")
```

(b)

(10%)

- c. What is the implicit parameter? Given the following example of comparing two date objects (`birthday` and `today`), which is the implicit parameter?

```
1 birthday.sameDate(today);
```

Rewrite the following method to show the implicit parameter in the code using the keyword `this`:

```
1 public void changeDay(int x){
2     day = day + x;
3     if (day > 28){
4         changeMonth();
5     }
6 }
```

(10%)

- d. Explain the concept of a 'black box' in programming. How does encapsulation allow us to achieve this concept in Java?

(10%)

- e. Java has many rules about what names we can use for classes, methods and variables (known as identifiers). In addition to this programmers should also follow a number of conventions for identifiers. For each of the following, list the conventions (**not the rules**) that you should follow:

(i) All identifiers

(iii) Variable identifiers

(ii) Class identifiers

(iv) Constant identifiers

(10%)

- f. Describe how Interfaces can be used to enable code reuse in Java. Describe in detail how an interface would be defined and implemented to make reusable code.

(10%)

g. Explain the concept of 'inversion of control'. What is required in our code to make this work? Why is this necessary when we are programming a graphical user interface?

(10%)

h. What format is Java code compiled into? Explain the purpose of the Java Virtual Machine (JVM) in executing Java code. How does this make Java programs portable between different architectures and operation systems?

(10%)

i. What is a Stack Trace? Explain the order that a stack trace is printed in and why.

(10%)

j. What is code coverage? With respect to code coverage, explain each of the following coverage criteria:

- Function coverage
- Statement coverage
- Branch coverage
- Condition coverage

(10%)

(Question Total 100%)

Total Marks (100%)