Exercises

Some questions from 2009 OOADP Examination

Question 1. (3 minutes)

"In order to be considered 'high quality', a software system must be…"

Which **one** of the following is the best completion of the previous sentence?

    A. useful, powerful and reliable.
    B. fast, affordable and usable.
    C. reliable, flexible and affordable.
    D. available, flexible and efficient.

Question 2. (3 minutes)

Which of the following was **not** a factor in the failure of Taurus?

    A. They tried to do too much in one go.
    B. Decisions were made by a small committee of powerful individuals without consulting all the stake-holders.
    C. They chose to use an expensive new system instead of modifying an existing one.
    D. Work was carried out by two competing consultancy firms.

Question 3. (3 minutes)

Which of the following statements are false?

    A. A module A is dependent on another module B if a change in A might necessitate a change in B.
    B. A module A is dependent on another module B if a change in B might necessitate a change in A.
    C. If A depends on B, then A is a client of B.
    D. If A depends on B, then A provides services to B.

Question 5. (3 minutes)

Correct the following program so that it prints out "Hello world!".

```
public class HelloWorld {
    public void main(String args) {
        System.out.println("Hello world!);
    }
```

Question 6. (3 minutes)

Write down the output of the following program:

```java
public class Question6 {
    public static void main(String[] args) {
        int d = -5;
        System.out.println("a" + d + d);
        System.out.println(d + d + "a");
    }
}
```

Question 7. (3 minutes)

Correct the following code fragment so that it prints out the contents of the array, a, in reverse order.

```java
int[] a = {1,2,3,4};
for (int i = a.length; i >= 0; i--)
    System.out.println(a[i]);
```
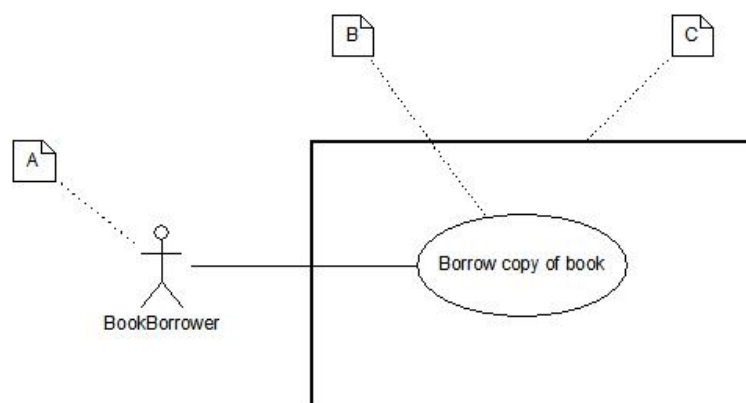
Question 8. (3 minutes)

Complete the following two sentences:

A. The _____ of a modelling language is the set of rules describing how model elements can be put together to make legal models.
B. The _____ of a modelling language is the set of rules governing how a legal diagram should be interpreted.

Question 12. (4 minutes)

Study the following diagram and answer the questions that follow it.

a. What kind of diagram is this?
b. What kind of thing is A?
c. What kind of thing is B?
d. What does C represent?

Some questions from 2009 OOADP Re-examination

Question 1

With reference to the Ariane 5 disaster, which **one** of the following statements is true?

- A. They used an expensive new system instead of modifying an existing one.
- B. The software was insufficiently flexible and not designed to be future-proof.
- C. Software was reused without properly testing it in its new context.
- D. The failure was caused by software trying to convert a 16-bit integer value for a vertical velocity component into a 64-bit floating-point value.

Question 2

According to the Standish Group CHAOS report (1994) which **one** of the following was the biggest cause of software project failure?

- A. The use of programming languages that do not properly support object-oriented design.
- B. Failures in requirements capture.
- C. Failure to reuse existing software ("re-inventing the wheel").
- D. Insufficient testing.

Question 3

Which **three** of the following adjectives describe the modules in a good software system?

- A. reusable
- B. cohesive
- C. replaceable
- D. abstract

Question 4

Study the following UML operation declaration and answer the questions that follow it.

```
+ computeSum(x : int, y: int) : int
```

- a. What is the selector of this operation?
- b. What are the names of the arguments of this operation?
- c. What is the return type of this operation?
- d. What is the visibility of this operation?

Question 5

Write down the output of the following program.

```
package dk.aau.imi.med4.ooadp2009.reexam;
public class ReExam5 {
    public static void main(String[] args) {
        int d = -5;
        System.out.println(d + d);
        System.out.println("a" + d + d);
        System.out.println("a" + (d + d));
    }
}
```

Question 6

Write down the output of the following program.

```
package dk.aau.imi.med4.ooadp2009.reexam;
public class ReExam6 {
    public static void main(String[] args) {
        int[] intArray = {1,2,3,4,5};
        for(int i = intArray.length - 1; i >= 0; i--)
            System.out.println(intArray[i]);
    }
}
```

Question 7

In the context of a diagrammatic modelling language, explain the meanings of the following terms. Use examples where appropriate.

  a. model elements
  b. syntax
  c. semantics

Question 8

Explain the difference between using UML in *sketch mode* and *blueprint mode*.

Questions from the 2010 OOADP Examination

Question 1. (5 marks)

Which **one** of the following is **not**, in general, a benefit of encapsulation and modularity?

  E. Less for developers to learn.
  F. Easier to debug.
  G. Easier to reuse code.
  H. Makes code shorter.

Question 2. (5 marks)

Which **one** of the following best describes the cause of the Ariane 5 disaster?

- E. The project was managed by a committee consisting of members with conflicting interests.
- F. The goals of the project were too ambitious.
- G. Software was reused in a new context without adequate testing.
- H. Software interlocks did not prevent the machine from being placed in a dangerous configuration.

Question 5. (5 marks)

Write a Java program that prints the message "Hello World!" to the standard output.

Question 6. (5 marks)

Write down the output of the following code fragment:

```java
int d = -5;
System.out.println(d + "d" + d);
System.out.println(d / 2);
System.out.println(d % 3);
```

Question 7. (5 marks)

Write down the output of the following code fragment. Marks will be given for formatting the output precisely as it would appear.

```java
for(int i = 5, j = 0; j < 5; i--, j += 2)
    System.out.println(i + " " + j);
```

Question 8. (5 marks)

Complete the following sentence by filling in the three blanks:

"An object is a *thing* that has _____ , _____ and _____ ."

Question 9. (5 marks)

The following line defines an operation in UML:

```
+ getY(x : int) : int
```

Write down (a) the *visibility* of this operation (using a complete word, not just a symbol), (b) the *signature* of this operation, (c) the *selector* of this operation, (d) the return type of this operation and (e) the argument(s) of this operation.

Question 10. (5 marks)

Suppose *a*, *b* and *c* are objects and that the following line appears in the class definition of object *a*:

b.msg(*c*)

Which **one** of the following statements is true?

    A. *a* sends the message msg to *b*.
    B. *a* sends the message msg to *c*.
    C. *b* sends the message msg to *a*.
    D. *b* sends the message msg to *c*.

Question 12. (5 marks)

Use the noun identification technique to produce a list of candidate classes from the following requirements statement:

"*The user selects the article to be copied. The system prompts the user to provide subscriber information for the journal or to indicate a method of payment for the article. Payment can be made by credit card or by quoting an organisational account number.*"