Object-Oriented Programming 2018/19 |A|
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Test – March 26, 2019

	tlačeným písmom		
Priezvisko:		1b	
Meno:		2b	

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8	
9	
10	

The test lasts 30 minutes.

Write the answers into the table. Only the answers in the table will be taken into account. In the multiple-choice questions only one choice is correct.

In case of making corrections, mark clearly which answer is valid. Each correct answer has the value as indicated in the question. An answer that is incorrect, ambiguous, or incomplete will be marked with 0 points. The work out is not considered.

A damaged paper will not be accepted.

1. (1 b) In a Java program being executed, a thread is represented by a

(a) method
(b) attribute
(c) process
(d) object
(e) constructor

2. (1 b) Graphical user interface frameworks, such as JavaFX and Swing, typically require

(a) attaching the necessary functionality to the corresponding elements of graphical user interface
(b) the implementation of monitoring the operations on graphical user interface elements outside the class that implements the corresponding window
(c) the implementation of monitoring the operations on graphical user interface elements inside the class that implements the corresponding window
(d) the implementation of monitoring the operations on graphical user interface elements inside the class that implements the main window
(e) attaching the necessary functionality to the window

3. (1 b) Which design pattern implements this code in Java (each class and interface provided in its own file)?

```java
public interface A {
    void p(B d);
    void q(B d);
    void r();
}

public interface B {
    void t();
}

public class A1 implements A {
    private List<B> bs = new ArrayList<>();
    ...

    public void c() {
        ...
        r();
    }
    public void d() {
        ...
        r();
    }
    public void e() {
        ...
        r();
    }
    public void p(B d) {
        bs.add(d);
    }
    public void r() {
        for (B b : bs) {
            b.t();
        }
    }
    ...
}

public class B1 implements B {
    private A1 a;
    ...

    public B1(A1 a) {
        this.a = a;
    }
    public void t() {
        ...
    }
    ...
}
```

(a) Strategy
(b) Observer
(c) Visitor
(d) none of the listed ones
(e) Composite

4. (1 b) An anonymous class in Java is being created

(a) using a lambda expression
(b) using a method reference
(c) directly at the place where the object is being created
(d) using the `anonymous` keyword
(e) using the **class** keyword without the **public** access modifiers

5. (1 b) A class is given

```java
public class C implements Serializable {
    public C l;
    public C p;
}
```

Specify which objects among a, b, c, d, and e are going to be saved in the f.out file after the following code has been executed (write the corresponding letters; the order is not significant):

```java
C a = new C();
C b = new C();
C c = new C();
C d = new C();
C e = new C();

a.l = c;
a.p = d;
b.l = d;
b.l = c;
c.l = e;
d.l = e;
e.l = a;

ObjectOutputStream out =
    new ObjectOutputStream(
        new FileOutputStream("f.out"));
out.writeObject(a);
out.close();
```

6. (1 b) To synchronize a non-static method in Java means to ensure

(a) a faster execution of this method
(b) locking of the current object (**this**) until the execution of the method is not completed
(c) even thread switching during the execution of this method
(d) locking of the current object (**class**) until the execution of the method is not completed
(e) immutability of this method in derived classes

7. (1 b) Access to attributes and methods is being restricted by access modifiers in order to

(a) ensure data and code concealing
(b) protect author rights
(c) make program execution faster
(d) decrease dependencies between classes
(e) enable inheritance

8. (1 b) What is the output of the following program in Java?

```java
interface T {
    void m();
}
abstract class C implements T {
    public void m() {
        System.out.print("C");
    }
}
class X extends C {
    public void m() {
        super.m();
        System.out.print("X");
    }
}
class Y extends X {
    public void m() {
        System.out.print("Y");
    }
}
class M {
    public static void exe(T... o) {
        for (T e : o) {
            e.m();
            System.out.print("-");
        }
    }
    public static void main(String[] args) {
        Y e1 = new Y();
        T e2 = new X();
        X e3 = (X) new Y();
        X e4 = new Y();

        exe(e1, e2, e3, (T) e4);
    }
}
```

9. (1 b) Outside the package the class is a part of and without having to import this package, the class

(a) can be accessed using its fully qualified name
(b) can be accessed the same way as within this package, but only to its **public** parts
(c) can't be accessed
(d) can be accessed the same way as within this package
(e) can be accessed for the purposes of creating its instances, but its methods can't be executed

10. (1 b) With aggregation in object-oriented programming

(a) the aggregated object will be of the aggregating object type
(b) no relationship between the aggregating and aggregated object occurs
(c) the aggregating object will be of the aggregated object type
(d) the aggregated object will contain the aggregating object type
(e) the aggregating object will contain the aggregated object type

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10 b

1 d

2 a

3 b

4 c

5 a, c, d, e

6 b

7 d; *a* is also accepted as it might be interpreted as informa-
tion hiding due to a missing explicit reference to prog-
rammers ("ensure data and code concealing *from prog-
rammers*")

8 Y-CX-Y-Y-

9 a

10 e