



University College Dublin
An Coláiste Ollscoile, Baile Átha Cliath

Java Programming / Professional Java Programming (COMP41200)

Exam 2, September 2010

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Instructions:

Answer ALL 30 questions. Clearly mark your choice(s) for each question on this exam paper. If you want to change your answer, please ensure that your final choice(s) is/are clearly marked.

Do NOT detach pages from this exam, and do NOT add anything - only your indicated choices will be marked, there is no need to provide any explanation. This is a closed-book exam.

Time allowed: 90 minutes.

1. Consider the following code fragment:

```
public class ExceptionHandleTester{
    public static void main(String[] args) {
        int x = 15;
        int y = 1;
        int []z = new int [5];
        z[1]=0;
        z[2]=0;
        try{
            System.out.println("x/y: " + x/y);
            System.out.println("x*y: " + x*y);
            System.out.println(z[1]);
            System.out.println(z[10]);
            System.out.println("x-y: " + (x-y));
        } catch (ArithmeticException ae) {
            System.out.println("An exception occurred: " + ae);
        }
        catch (ArrayIndexOutOfBoundsException oe) {
            System.out.println("An exception occurred: " + oe);
        }
        finally {
            System.out.println("finally block must be executed!");
        }
    }
}
```

Which of the following is part of the output? (Choose all that apply)

- A. x/y: 15
- B. x*y: 15
- C. finally block must be executed!
- D. x-y: 14
- E. An exception occurred: java.lang.ArithmeticException: / by zero

2. True or False: a **finally** block will be executed if there is no exception thrown in the corresponding **try** (assume no **System.exit()** statement is met).

- A. True
- B. False

3. Given the code:

```
public class test {  
    public static void main(String args[]) {  
        int i=1, j=1;  
        try {  
            i++;  
            j--;  
            if(i == j)  
                i++;  
        }  
        catch(ArithmeticException e) {  
            System.out.println(0);  
        }  
        catch(ArrayIndexOutOfBoundsException e) {  
            System.out.println(1);  
        }  
        catch(Exception e) {  
            System.out.println(2);  
        }  
        finally {  
            System.out.println(3);  
        }  
        System.out.println(4);  
    }  
}
```

Which of the following is part of the output? (Choose all that apply)

- A. 0
- B. 1
- C. 2
- D. 4
- E. none of the above

4. Which of these is a legal definition of a method named `m` which may throw an `IOException` and returns `void`, and which does not take any arguments? (Select the correct answer)

- A. `void m() throws IOException{}`
- B. `void m() throw IOException{}`
- C. `void m(void) throws IOException{}`
- D. `void m() {} throws IOException`

5. What is the output of the following code?

```
public class Logger {
    private static int loggerCount = 0;
    private final int logLevel;
    public static void main(String args[]) {
        createInstance(-1);
    }
    private Logger(int logLevel) throws IllegalArgumentException {
        if(logLevel < 0 || logLevel > 10) {
            throw new IllegalArgumentException("logLevel only takes values 0-10");
        }
        this.logLevel = logLevel;
    }
    public static Logger createInstance(int logLevel) {
        Logger retObj = null;
        try {
            retObj = new Logger(logLevel);
        }
        catch(IllegalArgumentException e) {
            System.out.println(e);
        }
        finally {
            loggerCount++;
        }
        return retObj;
    }
}
```

- A. `java.lang.IllegalArgumentException: logLevel only takes values 0-10`
- B. `0`
- C. `1`
- D. Code will not compile

6. Given the following code, what is the expected result?

```
1. import java.io.PrintWriter;
2. class DoFormat {
3.     public static void main(String [] args) {
4.         String s1 = null;
5.         String s2 = "TrUe";
6.         String s3 = "yes";
7.         String s4 = "no";
8.         Boolean b1 = new Boolean("tRuE");
9.         boolean b2 = false;
10.        System.out.printf("%b %b %b %b %b", s1, s2, s3, b1, b2, s4);
11.    }
12. }
```

- A. false true false true false
- B. false true true true false
- C. false true true true false false
- D. An exception is thrown at runtime.

7. Which of the following is an appropriate situation for assertions? (Choose all that apply)

- A. Preconditions of a public method
- B. Postconditions of a public method
- C. Preconditions of a private method
- D. Postconditions of a private method

8. While navigating the file system by using the methods of the `File` class, which of the following operations can you perform? (Choose all that apply)

- A. Change the current working directory.
- B. Delete a file.
- C. Create a file.
- D. Create a directory.

9. What is the output of the following code fragment? (Select the correct answer)

```
1:    String str = "Welcome";  
2:    str.concat(" to Java!");  
3:    System.out.println(str);
```

- A. Strings are immutable, so compilation error at line 2
- B. Prints "Welcome"
- C. Prints " to Java!"
- D. none of the above

10. Examine the following code and select the correct option(s), which if independently inserted at line 5 will compile/execute successfully and read/write 'Cafe4Java' to file *Cafe4Java.txt*

```
1. import java.io.*;  
2. public class CodeInsert{  
3. public static void main (String args[]) throws Exception {  
4. File file = new File ("Cafe4Java.txt");  
5. ///// INSERT CODE HERE  /////  
6. w.write ("Cafe4Java", 0, 9);  
7. w.flush();  
8. w.close();  
9 System.out.println(new BufferedReader(new FileReader (file)).readLine());  
10. }  
11. }
```

- A. `BufferedWriter w = new BufferedWriter (new FileWriter (new PrintWriter (file)));`
- B. `BufferedWriter w = new BufferedWriter (new PrintWriter (new FileWriter (file)));`
- C. `PrintWriter w = new PrintWriter (new FileWriter (new BufferedWriter (file)));`
- D. `FileWriter w = new FileWriter (new BufferedWriter (new PrintWriter (file)));`
- E. `PrintWriter w = new PrintWriter (new BufferedWriter (new FileWriter (file)));`
- F. `FileWriter w = new FileWriter (new PrintWriter (new BufferedWriter (file)));`

11. Select the correct answer: which method defined in `Integer` class can be used to convert an `Integer` object to primitive `int` type?

- A. `valueOf()`
- B. `intValue()`
- C. `getInt()`
- D. `getInteger()`

12. What is output when this code is compiled & run? Select the two correct answers.

```
public class test {  
    public static void main(String args[]) {  
        String s1 = "abc";  
        String s2 = new String ("abc");  
        if(s1 == s2)  
            System.out.println(1);  
        else  
            System.out.println(2);  
        if(s1.equals(s2))  
            System.out.println(3);  
        else  
            System.out.println(4);  
    }  
}
```

- A. 1
- B. 2
- C. 3
- D. 4

13. In the following code fragment, after execution of line 1, `s` references an instance of the `String` class. True or False: after execution of line 2, `s` still references the same instance.

```
1. String s = new String("abcde");  
2. s = s + "xyz";
```

- A. True
- B. False

14. Which of the following statements are true? (Choose all that apply)

- A. `StringBuffer` is generally slower than `StringBuilder`.
- B. `StringBuilder` is generally slower than `StringBuffer`.
- C. `StringBuilder` is threadsafe; `StringBuffer` is not.
- D. `StringBuffer` is threadsafe; `StringBuilder` is not.

15. True or False: `StringBuffer` objects once created cannot be modified.

- A. True
- B. False

16. Consider the following code:

```
class Mutate {  
    public static void main(String [] args) {  
        StringBuilder s = new StringBuilder("0123456789");  
        if (s.length() == 10)  
            s.insert(10, "abcdef");  
        s.delete(3,9);  
        System.out.println(s.indexOf("c"));  
    }  
}
```

What is the output?

- A. 7
- B. 6
- C. 5
- D. -1

17. Given the following code, what is the expected result?

```
import java.util.Scanner;
public class QTest17 {

    public static void main(String[] args) {

        Scanner scanner = new Scanner("hello 1 2.00 false");
        scanner.useDelimiter(" ");

        String str = scanner.next();
        int anInt = scanner.nextInt();
        float aFloat = scanner.nextFloat();
        boolean booleanValue = scanner.nextBoolean();

        System.out.println(str + ":" + anInt + ":" + aFloat + ":" +
booleanValue);
    }
}
```

- A. The program will throw an InputMismatch exception at run-time
- B. The program will produce no output
- C. The program will output 'hello:1:2.0:false'
- D. The program will output ':1:2.0:false'

18. Given the following code, what is the expected result?

```
import java.util.*;
public class QTest18 {
    public static void main(String[] args) {
        List<Box> boxes = Arrays.asList(new Box(10), new Box(-1), new Box(5),
new Box(2));
        Collections.sort(boxes, new BoxComparator());
        for (Box box : boxes){
            System.out.print((box).getSize() + " ");
        }
    }
}
class Box{
    public int size;
    public Box(int size){
        this.size = size;
    }
    public int getSize(){
        return size;
    }
}
class BoxComparator implements Comparator<Box>{
    public int compare(Box one, Box two) {
        if (one.getSize() == two.getSize()){
            return 0;
        }else if (one.getSize() < two.getSize()){
            return -1;
        }
        return 1;
    }
}
```

- A. The program will throw a `ClassCastException` at run-time.
- B. The program will compile and produce the output '10 -1 5 2'.
- C. The program will compile and produce the output '-1 2 5 10'.
- D. The program will compile and produce the output '10 5 2 -1'.

19. Given that `t` is a reference to a valid `Thread` object, with valid `run()` method for `t`:

```
9.  public void run() {  
10.      System.out.print("go ");  
11.  }
```

And:

```
18.  t.run();  
19.  t.start();
```

What is the result?

- A. Prints 'go '
- B. Prints 'go go '
- C. Compilation fails.
- D. An exception is thrown at runtime.

20. Given the following code:

```
class ThreadBoth extends Thread implements Runnable {  
    public void run(){ System.out.print("hi "); }  
    public static void main(String [] args){  
        Thread t1 = new ThreadBoth();  
        Thread t2 = new Thread(t1);  
        t1.run();  
        t2.run();  
        t1.run();  
    }  
}
```

What is the result?

- A. Prints 'hi '
- B. Prints 'hi hi '
- C. Prints 'hi hi hi '
- D. Compilation fails.
- E. An exception is thrown at runtime.

21. The `TreeSet` class is used to directly implement which collection interface?

- A. `Set`
- B. `SortedSet`
- C. `List`
- D. `Tree`

22. What is the return type of the method `hashCode()` defined in the `Object` class, which is used to get the unique hash value of an object?

- A. `int`
- B. `float`
- C. `void`
- D. `String`

23. Which of the following are methods of the `Object` class? (Choose all that apply)

- A. `wakeup()`
- B. `sleep()`
- C. `run()`
- D. `wait()`
- E. `notify()`

24. Given the code:

```
1. class Synch {  
2.     int i;  
3.     synchronized void go() {  
4.         Synch s = new Synch();  
5.         synchronized(this) { }  
6.         synchronized(s) { }  
7.     }  
8. }
```

Which line will cause a compilation error? (Choose one)

- A. line 3
- B. line 4
- C. line 6
- D. none of them – compilation succeeds

25. Consider the following code fragment:

```
1. ArrayList<ObjectOne> list = new ArrayList<ObjectOne>();  
2. list.add(new ObjectOne());  
3. class ObjectOne {  
4.     private int x = 0;  
5.     private int y = 0;  
6. }
```

What is the result of trying to compile this code fragment?

- A. Compiler error at line 2
- B. Runtime error at line 2
- C. Compiler error at line 3
- D. Runtime error at line 3
- E. No errors – compilation succeeds

26. Consider the following code:

```
1. import java.util.*;
2. class IntegerTest {
3.     public static void main(String [] args) {
4.         Integer i = new Integer(5);
5.         IntegerTest it = new IntegerTest();
6.         it.printIt(i);
7.     }
8.     void printIt(int wi) {
9.         int j = wi;
10.        System.out.println("The value is " + j);
11.    }
12.}
```

What is the result when this code is compiled and run?

- A. Prints 'The value is 5'
- B. Compiler error at line 4
- C. Compiler error at line 6
- D. Runtime error

27. How many locks does a class have?

- A. One
- B. One for each constructor defined in the class
- C. One for each method defined in the class

28. A programmer creates a class that correctly implements the `Comparable` interface. Which two statements are true?

- A. The required method returns an `int`.
- B. The required method returns a `boolean`.
- C. The class contains a method named `compareTo`.
- D. The class contains a method named `comparable`.

29. Given the following code:

```
import java.io.*;
class ClassForSerialization implements Serializable{
int x=9;
transient int y=10;
public static void main (String[] args){
try{
FileOutputStream out = new FileOutputStream("objectStore.ser");
ObjectOutputStream os = new ObjectOutputStream(out);
os.writeObject(new ClassForSerialization());
os.flush();
FileInputStream in = new FileInputStream("objectStore.ser");
ObjectInputStream is = new ObjectInputStream(in);
ClassForSerialization cfs = (ClassForSerialization)is.readObject();
System.out.println(cfs.x);
}
catch(Exception e){
System.out.println(e);
}
}
}
```

What is the output when this code is compiled and run?

- A. 9
- B. 10
- C. No output – compiler error
- D. No output – runtime exception

30. True or False: during the execution of a thread's `run()` method, the thread may temporarily stop executing, and later come back to the running state.

- A. True
- B. False