University College Dublin
An Coláiste Ollscoile, Baile Átha Cliath

Professional Java Programming (COMP41200) Exam 2, 13 January 2012

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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. You may bring some blank sheets into the exam (for rough work) but you should NOT submit them with your exam answers.

Time allowed: 90 minutes.

1. Consider the following code fragment:

```
public class ExceptionHandleTest{
 public static void main(String[] args) {
  int x = 15;
  int y = 1;
  int []z = new int [5];
  z[1]=0;
  try{
   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!");
  }
  System.out.println("x-y: " + (x-y));
 }
}
```

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 `catch` block could be executed if there is no exception thrown in the corresponding `try` (assume no `System.exit()` statement is met).

A. True

B. False

3. Which of the following should always be caught by a developer's Java code? (Choose all that apply)

A. Checked exceptions

B. Runtime exceptions

C. Assertion errors

D. Errors other than assertion errors

4. Consider the following code fragment:

```
public class TryTest{
  public static void main(String[] args) {
    try{
      System.out.println ("I was in try");
    } } }
```

Which *one* is the result of executing this code?

A. Output: ***I was in try***

B. A compiler error occurs.

C. The program compiles and runs but produces no output.

D. The program compiles but throws an exception during execution.

5. Which *one* 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?

A. `void m() {} throws IOException`

B. `void m() throw IOException{}`

C. `void m(void) throws IOException{}`

D. `void m() throws IOException{}`

6. Consider the following code fragment:

```
public class Q6 {
      public static void main(String[] args) {
            System.out.println(args.length);
            assert args.length != 0;
      }
}
```

Assuming you are using Java release 5.0 or later, which of the following conditions must be true in order for the code to throw an AssertionError? (Choose all that apply)

A. The source code must be compiled together with an Assertion-enabled package.

B. The program must be executed with the -ea option.

C. At least one argument is given in the execution command.

D. No argument is given in the execution command.

7. Which of the following is true about assertions in Java? (Choose all that apply)

A. Assertions are mostly used during testing to uncover internal program errors.

B. Assertions are used to report recoverable problems from one part of an application to another part of the application.

C. When you enable or disable assertions, you do not have to re-compile your Java program.

D. Assertions cannot be used to check the arguments passed to a public method.

8. True or False: when an instance of the `File` class is constructed in a Java program, the corresponding file will be created on the local file system if it does not already exist.

A. True

B. False

9. Which *one* of the following could be used to list the contents of a directory referenced by `myDir`?

A. `File[] contents = myDir.list();`

B. `String[] contents = myDir.list();`

C. `String[] contents = myDir.listAllFiles();`

D. Java's `File` class does not provide a method to list the contents of a directory.

10. How many 8-bit bytes does the following Java code fragment write to file *tester*?

```
FileOutputStream fos = new FileOutputStream("tester");
DataOutputStream dos = new DataOutputStream(fos);
dos.writeByte(-3); dos.writeDouble(1.0001);
dos.close(); fos.close();
```

A. 2

B. 5

C. 9

D. 10

11. What is output when this code is compiled & run? Select the <u>two</u> correct answers.

```
public class Q11 {
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

12. True or False: `StringBuilder` objects, once created, can then be modified.

A. True

B. False

13. Consider the line of code: `String str = new String("Hi");`

Which of the following modify the String to which `str` refers? (Choose all that apply)

A. `str.concat("there");`

B. `str.substring(1);`

C. `str.replace('H', 'M');`

D. `str.trim();`

E. None of the above

14. Consider the following code fragment:

```
1. public class Q14 {
2.   public static void main(String[] args) {
3.     String str = "Me" + " too";
4.     System.out.println(str);
5.   }
6. }
```

Which *one* of the following is true about this code fragment?

A. The code compiles and executes fine, and generates the output "Me too".

B. No output – a compiler error occurs.

C. Compiles fine, but there is no output and an exception is thrown at runtime.

15. Consider the line of code: `NumberFormat myNF = new NumberFormat();`

True or False: the `myNF` object reference can be used to format numbers or currencies for a specific locale if the locale is supplied as an argument to the appropriate method.

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(3,8);
    System.out.println(s.indexOf("b"));
  }
}
```

What is the output?

A. 7

B. 6

C. 5

D. -1

17. Which *one* of the following lines of code tells a Scanner called `sc` to use a single digit as a delimiter?

A. `sc.useDelimiter("d");`

B. `sc.useDelimiter("\d");`

C. `sc.useDelimiter("\\d");`

D. `sc.useDelimiter("d+");`

18. What happens when you try to compile and run the following application?

```
1. import java.util.*;
2.
3. public class Q18 {
4.   public static void main(String[] args) {
5.     Set<Q18> set = new TreeSet<Q18>();
6.     set.add(new Q18());
7.     set.add(new Q18());
8.   }
9. }
```

A. Compiler error.

B. An exception is thrown at line 5.

C. An exception is thrown at line 6.

D. An exception is thrown at line 7.

19. Which of the following statements about the `hashCode()` method in Java are *false*? (Choose all that apply)

A. The **`hashCode()`** method is implemented in the **`Object`** class.

B. If two objects are equal according to the **`equals()`** method, then invoking **`hashCode()`** on those objects must return the same hashcode value in each case.

C. If two objects are unequal according to the **`equals()`** method, then invoking **`hashCode()`** on those objects must return a different hashcode value in each case.

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

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

And later in the code we have:

```
10. t.run();
11. t.run();
12. t.start();
```

What is the result of lines 10—12?

A. Output is ***go***

B. Output is ***go go***

C. Output is ***go go go***

D. Compilation fails.

E. An exception is thrown at runtime.

21. What is the output of the following code fragment:

```
Integer i = new Integer(3);
Integer j = new Integer(3);
if(i == j){System.out.println("i is equal to j");}
else {System.out.println("i is not equal to j");}
```

A. Compilation fails.

B. An exception is thrown at runtime.

C. Output is ***i is equal to j***

D. Output is ***i is not equal to j***

22. True or False: An `ArrayList` provides constant-time access to a specific element in the list, but insertions and deletions are linear in time.

A. True

B. False

23. Which *one* of the following statements is false about the `wait()` method?

A. The **`wait()`** method is implemented in the **`Object`** class.

B. When a thread executes a call to the **`wait()`** method, it itself temporarily stops executing.

C. A call to **`wait()`** stops the application from executing.

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 <u>one</u>)

A. line 3

B. line 5

C. line 6

D. None of them – compilation succeeds.

25. The `HashSet` class is used to directly implement which collection interface?

A. `Set`

B. `SortedSet`

C. `List`

D. `Map`

26. Consider the following code:

```
1. import java.util.*;
2. public class Q26{
3.   public static void main(String[] args) {
4.     Integer x = 1;
5.     x++;
6.     Integer y = 2;
7.     if(x==y){
8.       System.out.println("Area: " + areaOfASquare(4.0d));
9.     }
10.  }
11.  public static Double areaOfASquare(Double side){
12.    return side*side;
13.  }
14. }
```

What is the result when you attempt to compile this code?

A. compiler error at line 4

B. compiler error at line 5

C. compiler error at line 7

D. compiler error at line 8

E. compiles fine (no errors)

27. What is the output of the following code fragment:

```
1. ArrayList<MyObject> lister = new ArrayList<MyObject>();
2. lister.add(new MyObject());
3. lister.add(new MyObject());
4. lister.add(new MyObject());
5. Collections.sort(lister);
6. class MyObject {
7.   private int i = 0;
8. }
```

A. Compiler error at line 3

B. Runtime error at line 3

C. Compiler error at line 5

D. Runtime error at line 5

E. No errors – compiles and runs fine

28. A thread `t` is waiting along with some other threads in the waiting pool. How can the `notify()` method be used to bring thread `t` out of the `wait` state?

A. Execute **`t.notify()`** from a synchronized piece of code.

B. Execute **`notify(t)`** from a synchronized piece of code.

C. With **`notify()`**, you cannot specify which thread is brought out of the **`wait`** state.

29. True or false: `Thread(Runnable r, String s)` is a legal `Thread` constructor in Java.

A. True

B. False

30. True or false: Java's `String` class can be subclassed in your code using the keyword `extends`.

A. True

B. False