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:

```java
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 <u>independently</u> 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 <u>two</u> 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?

```java
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?

```java
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 <u>one</u>)

    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 <u>two</u> 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:

```java
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

1. A. B. C.
2. A.
3. D.
4. A.
5. A.
6. B.
7. B. C. D.
8. B. C. D.
9. B.
10. B. E.
11. B.
12. B. C.
13. B.
14. A. D.
15. B.
16. B.
17. C.
18. C.
19. B.
20. C.
21. B.
22. A.
23. D. E.
24. D.
25. E.
26. A.
27. A.
28. A. C.
29. A.
30. A.