Review for Chapter 3 Test

Multiple-Choice Questions

1) Which properties are true of String objects?
A) Their lengths never change
B) The shortest string has zero length
C) Individual characters within a String may be changed using the replace method
D) The index of the first character in a string is one
E) Only A and B are true

Answer: E

2) What happens if you attempt to use a variable before it has been initialized?
A) A syntax error may be generated by the compiler
B) A runtime error may occur during execution
C) A "garbage" or "uninitialized" value will be used in the computation
D) A value of zero is used if a variable has not been initialized
E) Answers A and B are correct

Answer: E

3) In Java, "instantiation" means
A) noticing the first time something is used
B) creating a new object of the class
C) creating a new alias to an existing object
D) launching a method
E) none of the above

Answer: B

4) Say you write a program that makes use of the Random class, but you fail to include an import statement for java.util.Random (or java.util.*). What will happen when you attempt to compile and run your program.
A) The program won't run, but it will compile with a warning about the missing class.
B) The program won't compile-you'll receive a syntax error about the missing class.
C) The program will compile, but you'll receive a warning about the missing class.
D) The program will encounter a runtime error when it attempts to access any member of the Random class
E) none of the above

Answer: B

5) Which of the following will yield a pseudorandom number in the range [–8, 8) given the following:
Random gen = new Random( );
A) gen.nextFloat( ) * 8
B) gen.nextFloat( ) * 10 – 8

C) gen.nextFloat( ) * 8 – 10
D) gen.nextInt( ) * 10 – 8
E) gen.nextInt(10) – 8

Answer: B

6) Consider the following two lines of code. What can you say about s1 and s2?

```
String s1 = "testing" + "123";
String s2 = new String("testing 123");
```

A) s1 and s2 are both references to the same String object
B) the line declaring s2 is legal Java; the line declaring s1 will produce a syntax error
C) s1 and s2 are both references to different String objects
D) s1 and s2 will compare "equal"
E) none of the above

Answer: C

7) An "alias" is when
A) two different reference variables refer to the same physical object
B) two different numeric variables refer to the same physical object
C) two different numeric variables contain identical values
D) two variables have the same names
E) none of the above

Answer: A

8) The String class' compareTo method
A) compares two string in a case-independent manner
B) yields true or false
C) yields 0 if the two strings are identical
D) returns 1 if the first string comes lexically before the second string
E) none of the above

Answer: C

9) Given the following code fragment

```
String strA = "aBcDeFg";
String strB = strA.toLowerCase( );
strB = strB.toUpperCase( );
String strC = strA.toUpperCase( );
```

A) strB.equals(strC) would be true
B) strB.compareTo(strC) would yield 0
C) strA.compareTo(strC) would yield 0
D) strA.equals(strC) would be true
E) none of the above

Answer: B

10) Java.text's NumberFormat class includes methods that
A) allow you to format currency
B) allow you to format percentages
C) round their display during the formatting process
D) truncate their display during the formatting process
E) A, B, C, but not D

Answer: E

11) The advantages of the DecimalFormat class compared with the NumberFormat class include
A) precise control over the number of digits to be displayed
B) control over the presence of a leading zero
C) the ability to truncate values rather than to round them
D) the ability to display a % automatically at the beginning of the display
E) only A and B

Answer: E

12) Consider the following enumeration

```
enum Speed { FAST, MEDIUM, SLOW };
```

A) The ordinal value of MEDIUM is 2
B) The ordinal value of SLOW is 1
C) The name of the Speed enumeration whose ordinal value is zero is FAST
D) The name of the Speed enumeration whose ordinal value is one is SLOW
E) None of the above

Answer: C

13) In addition to their usage providing a mechanism to convert (to box) primitive data into objects, what else do the wrapper classes provide?
A) enumerations
B) static constants
C) arrays to contain the data
D) exceptions
E) none of the above

Answer: B
14) Which is the Java equivalent of the following mathematical expression?

c = $\sqrt{a^2 + b^2}$

a) `c = Math.sqrt(a * 2 + b * 2);`
b) `c = Math.sqrt(a * 2) + Math.sqrt(b * 2);`
c) `c = Math.sqrt(Math.pow(a, 2) + Math.pow(b, 2));`
d) `c = Math.sqrt(Math.pow(a, 2)) + Math.sqrt(Math.pow(b, 2));`

Answer: c

15) What is the result of the following statement?

```
String s = "You" + "had" + "me" + "at" + "hello";
```

a) The string s has the following value: "You had me at "hello"
b) The statement results in an error because the + operator can be used only with numbers
c) The statement results in an error because the + operation cannot be performed on string literals
d) The string s has the following value: "Youhadmeathello"

Answer: d

16) What is the output of the following code snippet?

```
public static void main(String[] args){
{
   String str1;
   str1 = "I LOVE MY COUNTRY";
   String str2 = str1.substring(4, 11);
   System.out.println(str2);
}
```

a) OVE MY
b) OVE MY C
c) VE MY CO
d) VE MY C

Answer: d

17) Which one of the following statements can be used to extract the last five characters from any string variable `str`?

a) `str.substring(str.length() - 5, str.length())`
b) `str.substring(5, 5)`
c) `str.substring(str.length() - 4, 5)`
d) `str.substring(str.length() - 5, 5)`

Answer: a

True/False Questions

18) Only difficult programming problems require a pseudocode solution before the programmer creates the implementation (program) itself.

Answer: FALSE

19) You may apply the prefix and postfix increment and decrement operators to instances of the Integer class.

Answer: FALSE

20) In Java, the symbol "=" and the symbol "==" are used synonymously (interchangeably).

Answer: FALSE

21) When comparing any primitive type of variable, == should always be used to test to see if two values are equal.

Answer: FALSE

22) These two ways of setting up a string yield identical results:
a) String string = new String("string");
b) String string = "string";

Answer: TRUE

23) These two ways of setting up a String yield identical results:
a) String string = "12345"
b) String string = 12345;

Answer: FALSE

24) These two ways of setting up a String yield identical results:
a) String string = new String("123.45");
b) String string = "" + 123.45;

Answer: TRUE

25) These two ways of setting up a String yield identical results:
a) String string = new String(12345);
b) String string = new String("12345");

Answer: FALSE

26) System.out.println("123" + 4) will display the value 127.

Answer: FALSE

27) You may use the String replace( ) method to remove characters from a String.

Answer: FALSE

28) The Random class' setSeed( ) method allows you to restart the pseudo-random number sequence.

Answer: TRUE

29) All the methods in the Math class are declared to be static.

Answer: TRUE

30) The names of the wrapper classes are just the names of the primitive data types, but with an initial capital letter.

Answer: FALSE
Note: This is true for most of the wrapper classes, but it is false for **int** (Integer) and **char** (Character).

Free-Form/Short Answer Questions

31) Consider the condition (x == y). How is this handled if x and y are primitive types? How is this handled if x and y are objects?

Answer: If x and y are primitive types, then the values stored in x and y are compared and true is returned if the two values are equal. If x and y are objects, then the object that x and y reference are compared. If they are the same object, it returns true, otherwise it returns false.

32) Given two String variables, s1 and s2, is it possible for (s1 != s2) to be true while (s1.equals(s2)) is also true? Why or why not?

Answer: The condition (s1!= s2) means that s1 and s2 are references to two distinct Objects. It says nothing about the contents of the referenced Objects. So, the contents of s1 may well be identical or different from the contents of s2. Therefore it is quite possible that (s1.equals(s2)) is true while (s1 != s2) is also true.

33) What is a wrapper class? Why are they useful?

Answer: A wrapper class is a class that allows you to embed one piece of primitive data within an Object. There are methods for extracting the data from the Object. Wrapper classes are useful where you have methods (or constructors) that only accept Objects not primitive data. By wrapping the primitive data within an Object the functionality of the method (and its class) may be accessed.

For the questions below: Assume an interactive Java program which asks the user for their first name and last name, and outputs the user's initials.

34) For the program to get a name interactively a Scanner object must be instantiated. Write the Java statement to do this.

Answer: Scanner scan = new Scanner(System.in);

35) Write a statement using a Scanner method to get the first name interactively.

Answer: firstName = scan.nextLine( );

36) Write a method to extract the initial from the first name.

Answer: firstInitial = firstName.substring(0,1);

37) Write a statement using a method to guarantee that the initial will be a capital letter.

Answer: firstInitial = firstInitial.toUpperCase( );