CSC 156 *Java Computer Science I* Sample Final Exam

Student Name **Answer Key** Group ___ Date _____

Elements of Computer Programming with Java

Choose from (a), (b), (c), (d) or (e) to answer the given problem.

(1) Which import declaration is necessary to include in a `.java` file that will execute the following statement?

```
JOptionPane.showMessageDialog(null,"hello");
```

(a) `import java.io.*;`
(b) `import java.text.*;`
(c) `import javax.swing.JOptionPane;`
(d) `import javax.swing;`
(e) `import java.awt.Graphics;`

(2) `firstNum = JOptionPane.showInputDialog("enter a number");`

Given the above statement, write the line of code that converts the `String` variable `firstNum` to a `double` and assigns to it the variable `num1`.

(a) `double num1 = Double.parseDouble(firstNum);`
(b) `String num1 = Double.parseDouble(firstNum);`
(c) `int num1 = Integer.parseInt(firstNum);`
(d) `double firstNum = Double.parseDouble(num1);`
(e) `double num1 = Double.parseDouble(num1);`

(3) Correct the following program code such that the `while` loop will print the product of all integers between 1 and 10, inclusive. Reference the correction by the line number.

```
int i = 0;              // line 1
int product = 1;        // line 2
while(i <= 10)          // line 3
{                       // line 4
  product *= i;         // line 5
  i++;                  // line 6
}                       // line 7
```

(a) line 2 should be: `double product = 0;`
(b) line 5 should be: `product *= product;`
(c) line 3 should be: `while(i >= 10)`
(d) line 6 should be: `i += 1;`
(e) line 1 should be: `int i = 1;`

(4) Which Java keyword causes immediate execution from a repetition statement?

(a) `break` (b) `continue` (c) `if` (d) `else` (e) `System`

(5) What is the result when the following expression is executed? `15 + 17 % 2`

(a) 21 (b) 14 (c) 15 (d) 19 **(e) 16**

(6) What is the result when the following expression is executed? `15 % 17 + 2`

(a) 2 (b) 14 (c) 15 **(d) 17** (e) 16

(7) A(n) _____ statement handles a series of decisions, in which a particular variable or expression is tested for values it can assume and different actions are taken.

(a) `parse` (b) `continue` (c) `break` **(d) `switch`** (e) `case`

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(8) Infinite loops occur when the loop - continuation condition in a repetition statement never becomes _____ .

(a) visible (b) available (c) `true` (d) accessible **(e) `false`**

(9) Assume that `intFour` and `intFive` are integers with values `10` and `20`, respectively. Find the value of this expression.

```
int num = intFour * 2 / intFive * 3;
```

(a) 15 (b) 2 (c) 28 (d) 0 **(e) None of these**

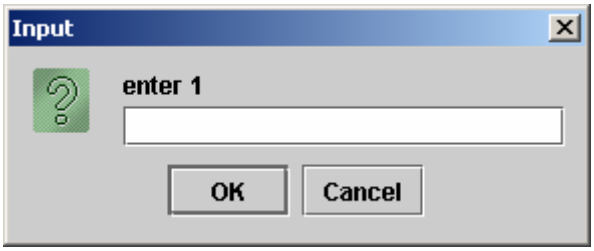
(10) Assume that `one`, `two` and `three` are real numbers with values `3.0`, `5.0` and `8.0`, respectively. Find the value of this real number expression. `two + three * one`

(a) 16.0 (b) 43.0 (c) 64.0 (d) 12.0 **(e) 29.0**

(11) Write a single Java statement to display this dialog box.

(a) `JOptionPane.showMessageDialog(null,"message");`
(b) `JOptionPane.showInputDialog(null,"welcome");`
(c) `JOptionPane.showInputDialog(null,"message"+"welcome");`
(d) `JOptionPane.showMessageDialog("welcome","message");`
(e) `JOptionPane.showMessageDialog(null,"welcome");`

(12) Write a single Java Statement to display this dialog box.



(a) `JOptionPane.showInputDialog("enter 1");`
(b) `JOptionPane.showInputDialog(null, "1");`
(c) `JOptionPane.showMessageDialog("enter 1");`
(d) `JOptionPane.showInputDialog("enter", "1");`
(e) `JOptionPane.showMessageDialog("enter", "1");`

(13) The expression `Math.pow(3, 1)` evaluates to `3`. **(a) True** (b) False

(14) `Math.pow(Math.pow(3, 2), 2)` evaluates to 243. (a) True **(b) False**

(15) `Math.max( Math.min( 3.0 , 2 ), 4.0 )` evaluates to `4`. **(a) True** (b) False

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(16) Given the following program segment, what value does y now contain?

```
int x = 10, y;
if(x > 4) y = 17; else y = 24;
```

(a) 5 (b) 4 (c) 24 (d) 22 **(e) 17**

(17) Given the following program segment, what value does y now contain?

```
int x = 10, y;
if(x > 4) if (x < 4) y = 17; else y = 24; else y = 24;
```

(a) 17 **(b) 24** (c) 19 (d) 22 (e) 7

(18) Consider the following program segment.

```
if (age >= 21 || age == 15)
    JOptionPane.showMessageDialog(null, "Red ID");
else
    JOptionPane.showMessageDialog(null, "Blue ID");
```

Which of these values of age will cause `"Blue ID"` to be displayed?

(a) 15 (b) 21 **(c) 19** (d) 22 (e) Both (a) and (c)

(19) According to logician Augustus DeMorgan, `!( p && q )` is equivalent to _____ .

(a) `! p || ! q` (b) `! p && ! ! q` (c) `! p || q` (d) `p || ! q` (e) Both (a) and (b)

(20) According to logician Augustus DeMorgan, `!( p || q )` is equivalent to _____ .

(a) `p && q` **(b) `! p && ! q`** (c) `p || q` (d) `!( p && q )` (e) None of these

For **(21)** through **(25)**, consider the code segment below.

```
String message = "please enter 1, 2, 3, 4 or 5";
String choice = JOptionPane.showInputDialog(message);
int num = 10, select = Integer.parseInt(choice);
switch (select)
{
    case 1: num *= num + 5; break;
    case 2: num /= num - 4;
    case 3: num -= num * 3; break;
    case 4: num += num;
    default: num = select;
} JOptionPane.showMessageDialog(null, "" + num);
```

(21) If the user enters 1, then 10 is displayed in the message box. (a) True **(b) False**

(22) If the user enters 2, the message box displays – 2. (a) True **(b) False**

(23) If the user enters 3, the message box displays – 20. **(a) True** (b) False

(24) If the user enters 4, the message box displays 0. (a) True **(b) False**

(25) If the user enters 6, the message box displays 6. **(a) True** (b) False

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For **(26)** through **(30)**, consider the code segment below.

```
int x, y;

if(x > 5)
   y = 1;
else if (x < 5) {
   if(x < 3)
     y = 2;
   else
     y = 3;
}
else
  y = 4;
```

(26) Based on the code above, what is the value of y if x = 5?

(a) 1 (b) 2 (c) 3 **(d) 4** (e) 5

(27) Based on the code above, what is the value of y if x = 6?

(a) 1 (b) 2 (c) 3 (d) 4 (e) 5

(28) Based on the code above, what is the value of y if x = 3?

(a) 1 (b) 2 **(c) 3** (d) 4 (e) 5

(29) Based on the code above, if the value of y is equal to 5, a possible value of x is ___.

(a) 2 (b) 3 (c) 4 (d) 5 **(e) None of these**

(30) Based on the code above, if the value of y is equal to 2, a possible value of x is ___.

(a) 2 (b) 3 (c) 4 (d) 5 (e) 6

(31) The following would switch the values of intA and intB. **(a) True** (b) False

```
intA = intA + intB;
intB = intA - intB;
intA = intA - intB;
```

(32) Karl F. Gauss had an algorithm that was more efficient than a for loop for summing the numbers 1 through N. To sum the numbers he used N(N + 1)/2.

(a) True (b) False

For **(33)** through **(35)**, consider the code segment below.

```
double[] a = {1.1, 2.2, 3.3};
a[y] = a[x];
System.out.println(a[2] + "  " + a[1] + "  " + a[0]);
```

(33) If x is 2 and y is 0, then **3.3 2.2 1.1** is displayed to the user. (a) True (b) False

(34) If y is 2 and x is 0, then **3.3 2.2 2.2** is displayed to the user. (a) True (b) False

(35) If x is 1 and y is 1, then **3.3 2.2 1.1** is displayed to the user. **(a) True** (b) False

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	[0]	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]
list	16	30	24	7	25	62	45	5	65	46

(36) On average, how many comparisons would have to be made to find an element in the list above?

(a) 2 **(b) 5** (c) 6 (d) 8 (e) 7

(37) How many key comparisons would have to be made on the list above to find the number 46?

(a) 1 (b) 2 (c) 9 **(d) 10** (e) 65

	[0]	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
list	5	4	12	10	32	29	46	49	16

(38) Consider a sequential sort on the above list. On the second pass, which two elements would be swapped first?

(a) 4 and 5 **(b) 16 and 46**
(c) 10 and 12 (d) None of these

(39) Using the array below and assuming the bubble sort is used to sort the array `Age` from smallest to largest, what are the contents of the array after three passes?

`Age: 17 , 18 , 20 , 43 , 10 , 15 , 33`

(a) `10 , 15 , 18 , 17 , 20 , 33 , 43`
(b) `10 , 17 , 18 , 15 , 20 , 33 , 43`
(c) `10 , 15 , 18 , 17 , 15 , 33 , 43`
(d) `10 , 15 , 17 , 18 , 20 , 33 , 43`
(e) None of these

```
public static int exampleRecursion (int n) {
     if (n == 0)
       return 1;
     else
       return exampleRecursion (n - 1) + n;
}
```

(40) Refer to the code above. What is the output of `exampleRecursion(3)`?

(a) 16 (b) 12 (c) 5 (d) 8 **(e) 7**

(41) Consider the following programming segment:

```
if (x < 5)
  if (y <= 13)
    doSomething();
  else
    doSomethingElse();
```

Which expression must be false for `doSomethingElse()` to be executed?

(a) x < 5 (b) y > 13
(c) both must be false **(d) None of these**

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(42) The three basic control mechanisms are sequence, _____ and repetition.

(a) selection (b) looping (c) succession (d) iteration (e) step - by - step

(43) The result of the execution of the following three statements would be that x is equal to:

```
x = 2;
x += -9;
x *= 2;
```

(a) 12 (b) −36 (c) 16 (d) −14 **(e) none of these**

(44) One of the key features of Java is that it is _____ - independent.

(a) compiler (b) user (c) bytecode (d) interpreter **(e) platform**

(45) The beginning of a comment in Java can be indicated with _____ .

(a) `*/` (b) { **(c) `/*`** (d) `**` (e) !

(46) A Java program that can run inside of a Web browser is called a(n) _____ .

(a) import (b) argument **(c) applet** (d) application (e) container

(47) A Java " application " program must have a(n) _____ method.

(a) start (b) `swing` **(c) `main()`** (d) package (e) import

(48) Which of the following is NOT a legal Java identifier?

(a) `4wheel`
(b) `_blank`
(c) `milesPerHour`
(d) all of these
(e) none of these

Consider the following code and answer each of the questions given below.

```
public static int minimum(int x, int y)
{
  int smaller;

  if(x < y)
    smaller = x;

  else
    smaller = y;

  return smaller;
}
```

(49) What is the name of the method above?

(a) `x` (b) `smaller` (c) `y` **(d) `minimum`** (e) `larger`

(50) Based on the figure above, what would be the output of the following statement?

```
int s = minimum(5, minimum(3, 7));
```

(a) 3 (b) 5
(c) 7 (d) There would be no output as this is not a valid statement.

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Elements of Computer Programming with Java - Coding Potion

Devon Auto Repair customers are billed at the rate of $ 25 per hour for labor. Also, parts and supplies are subject to a 6 % sales tax. The total customer bill amount is computed by adding the total labor charge plus and total charge for parts and supplies. A 10 % labor charge discount applies to all repairs which require more than 10 hours.

Write program code which will display a simplified customer bill. The customer's name, the number of hours and the cost of parts and supplies should be entered into the program via the keyboard. The customer's name (indented), the subtotal, the tax and the grand total is to be displayed to the user.

```
import java.io.*;

public class Devon {
  static BufferedReader keyboard = new
         BufferedReader(new InputStreamReader(System.in));

public static void main(String args[]) throws IOException
{
  String strName;
  double hours, parts, subtotal,total = 0, tax;
  System.out.print("Please enter the customer name: ");
  System.out.flush();
  strName = keyboard.readLine();
  System.out.print("Please enter the hours: ");
  System.out.flush();
  hours = Double.parseDouble(keyboard.readLine());
  System.out.print("Please enter the cost of parts: ");
  System.out.flush();
  parts = Double.parseDouble(keyboard.readLine());
  System.out.println();
  tax = parts * .06;
  if(hours > 10)
    subtotal = 25 * hours * .90;
  else
    subtotal = 25 *hours;
  subtotal += parts;
    total = subtotal + tax;
  System.out.println("customer name: " + strName);
  System.out.println("subtotal: " + subtotal);
  System.out.println("tax: " + tax);
  System.out.println("total: " + total);
  }
}
```