

Note: Correct responses are based on Java, J2sdk v 6.0, from Sun Microsystems, Inc. All provided code segments are intended to be syntactically correct, unless otherwise stated (i. e. `error type` is an answer choice) and any necessary Java 2 Standard Packages have been imported. Ignore any typographical errors and assume any undefined variables are defined as used.

QUESTION 1

What is the sum of 11101_2 and 10000_2 ?

- A. 65_{10} B. 228_5 C. 58_{10} D. 54_7 E. 63_7

QUESTION 2

What is output by the code to the right?

- A. -3 B. 2
C. 8 D. -2
E. There is no output due to a syntax error.

```
int a = 5 + -3;
System.out.println(a);
```

QUESTION 3

What is output by the code to the right?

- A. 3.67 B. 3.34 C. 3.33 D. 3.00
E. There is no output due to a syntax error.

```
double b = 15 / 4.5;
System.out.printf("%.2f",b);
```

QUESTION 4

What is output by the code to the right?

- A. 8 B. 10
C. 11 D. 12
E. There is no output due to a syntax error.

```
long w = 25;
for( w += 5; w > 10; w += -2){
    w += 1;
}
System.out.print( w );
```

QUESTION 5

What is output by the code to the right?

- A. -1 B. 3
C. 4 D. 6
E. 2

```
String d = "heartsandcandies";
System.out.print( d.indexOf( "art" ) );
```

QUESTION 6

What is output by the code to the right?

- A. 2 B. 5
C. 3 D. 4
E. There is no output due to a runtime exception.

```
int[] ray = {2,3,4,5,1,0,9,7,6};
System.out.println( ray[3] );
```

QUESTION 7

What is output by the code to the right?

- A. yes B. no
C. false D. true
E. There is no output due to a syntax error.

```
boolean one = false;
boolean two = !one;
System.out.println( two );
```

<p>QUESTION 8</p> <p>What is output by the code to the right?</p> <p>A. 402 B. 460 C. 500 D. 513 E. 600</p>	<pre>String x = "alligator"; int s = 0; for(int i=0; i < x.length(); i++) { char c = x.charAt(i); if(c % 2 != 0) s += c; } System.out.println(s);</pre>
<p>QUESTION 9</p> <p>What is output by the line marked //1 in the client code to the right?</p> <p>A. RED B. BLUE C. red D. blue E. There is no output due to a syntax error.</p>	<pre>public class Train { private String color; public Train (String c) { color = c; } public String toString() { return "" + color; } } //////////////////////////////////// //client code Train tr = new Train("BLUE"); System.out.println(tr); //1 tr = new Train("RED"); System.out.println(tr); //2</pre>
<p>QUESTION 10</p> <p>What is output by the line marked //2 in the client code to the right?</p> <p>A. RED B. BLUE C. red D. blue E. There is no output due to a syntax error.</p>	
<p>QUESTION 11</p> <p>What is output by the code to the right?</p> <p>A. 10pig B. 10 C. pig D. pig10 E. piggy10</p>	<pre>System.out.println("pig" + 10);</pre>

<p>QUESTION 12</p> <p>What is output by the code to the right?</p> <p>A. 60 B. 62 C. 50 D. 52 E. There is no output due to a syntax error.</p>	<pre>System.out.println(5 * 10 + 2);</pre>
<p>QUESTION 13</p> <p>What is output by the code to the right?</p> <p>A. 40 B. 5 C. 24 D. 32 E. 20</p>	<pre>ArrayList<Integer> li; li = new ArrayList<Integer>(); li.add(3); li.add(8); li.add(4); li.add(5); li.add(1); li.add(7); Iterator<Integer> it = li.iterator(); it.next(); it.next(); out.print(it.next() * it.next());</pre>
<p>QUESTION 14</p> <p>What is output by the client code to the right?</p> <p>A. 46 B. 48 C. 40 D. 50 E. 44</p>	<pre>public static int doh(int cnt) { int val = 0; for(int i=0; i < cnt; i++) for(int j=0; j < cnt; j++) val = val + i; return val; } //////////////////////////////////// //client code out.println(doh(5));</pre>
<p>QUESTION 15</p> <p>What is output by the code to the right?</p> <p>A. -4 B. 8 C. 4 D. 5 E. 7</p>	<pre>String j = "wooganowskirocks"; out.print(j.charAt(1) - j.charAt(9));</pre>
<p>QUESTION 16</p> <p>Which of the following <u>could</u> be output by the code to the right?</p> <p>A. 0 B. 17 C. 20 D. A and B only E. A, B, and C</p>	<pre>int z = (int) (Math.random()*20); System.out.println(z);</pre>

<p>QUESTION 17</p> <p>What is the value of <code>a[3]</code> after this code segment is executed?</p> <p>A. 66 B. 98 C. 97 D. 67 E. There is no output due to a runtime error.</p>	<pre>int count = 0; int a[] = {1,3,5,'a',7,9,2}; for(int i=0; i < a.length;i++) { if(!(a[i] % 2 > 0)) break; else a[i] = a[i]+1; } for(int i=0;i<a.length;i++) if(a[i] % 2 == 0) count++;</pre>
<p>QUESTION 18</p> <p>What is the value of <code>count</code> after this code segment is executed?</p> <p>A. 6 B. 7 C. 5 D. 8 E. There is no output due to a runtime error.</p>	
<p>QUESTION 19</p> <p>What is output by the code to the right?</p> <p>A. [2, 5, 7, 4] B. [2, 5, 4, 9] C. [9, 4, 5, 7] D. [7, 4, 5, 2] E. There is no output due to a runtime error.</p>	<pre>ArrayList<Integer> list; list = new ArrayList<Integer>(); list.add(9); list.add(1); list.add(0,3); list.remove(0); list.add(5); list.remove(0); list.set(0,4); list.add(2); list.add(0,7); System.out.println(list);</pre>
<p>QUESTION 20</p> <p>What is output by the code to the right?</p> <p>A. 10.0 B. 8.0 C. 9.0 D. 9 E. 11.0</p>	<pre>double dbl = Math.sqrt(100); System.out.print(dbl);</pre>
<p>QUESTION 21</p> <p>What is output by the code to the right?</p> <p>A. 35 B. 42 C. 31 D. 53 E. 48</p>	<pre>System.out.println(17 ^ 33);</pre>
<p>QUESTION 22</p> <pre>Integer[] n = {11,13,25,23};</pre> <p>What is returned by <code>go(n)</code>?</p> <p>A. 1 B. 2 C. 3 D. 4 E. 0</p>	<pre>//pre :: n.length > 0 public static int go(Integer[] n) { int x = n[0]; for(int i : n) x ^= i; return x; }</pre>
<p>QUESTION 23</p> <pre>Integer[] n = {12,22,43,16,100};</pre> <p>What is returned by <code>go(n)</code>?</p> <p>A. 51 B. 62 C. 66 D. 70 E. 73</p>	

<p>QUESTION 24</p> <p>What is the <i>last</i> integer printed by this code segment?</p> <p>A. 1 B. 2 C. 0 D. -1</p> <p>E. There is not output due to a runtime error.</p>	<pre>int x = 30; while(x > 0) { System.out.println(x--); }</pre>
<p>QUESTION 25</p> <p>What is returned by the method call <code>cupid(7)</code> ?</p> <p>A. -32 B. 18 C. 26 D. 10 E. 14</p>	<pre>public static int cupid(int x) { if(x<1) return 1; else return cupid(x-2) - cupid(x-1) + 2; }</pre>
<p>QUESTION 26</p> <p>What is returned by the method call <code>cupid(10)</code> ?</p> <p>A. -32 B. 18 C. 26 D. 10 E. 14</p>	
<p>QUESTION 27</p> <p>Which of the following correctly replaces <code><*1></code> so that the loop variable is incremented by 1 each iteration?</p> <p>A. <code>i + 1</code> B. <code>i = i + 1</code></p> <p>C. <code>i += 2</code> D. A and B only</p> <p>E. A, B, and C only</p>	<pre>int[][] a = new int[10][10]; int x = 0, y = 9; for(int i = 0; i < 10; <*1>) { a[y][x] = i; y--; x++; } System.out.print(a[0][9]); System.out.print(a[1][8]); System.out.print(a[3][6]);</pre>
<p>QUESTION 28</p> <p>Assuming that <code><*1></code> is filled correctly, what is output by the code to the right?</p> <p>A. 987</p> <p>B. 000</p> <p>C. 964</p> <p>D. 986</p> <p>E. 853</p>	
<p>QUESTION 29</p> <p>Which of the following could replace <code><*1></code> in the code to the right so that all items would be popped from the stack?</p> <p>A. <code>t.pop()</code></p> <p>B. <code>t.remove(t.size()-1)</code></p> <p>C. <code>t.remove()</code></p> <p>D. A and B only</p> <p>E. A, B, and C</p>	<pre>Stack<Integer> t; t = new Stack<Integer>(); int[] a = {1, 2, 3, 4, 5, 6}; for (int num : a) { t.push(num); }</pre>
<p>QUESTION 30</p> <p>What is output by the code to the right assuming <code><*1></code> is filled correctly?</p> <p>A. 6 5 4 3 2 1</p> <p>B. 1 2 3 4 5 6</p> <p>C. 1 2 3</p> <p>D. 6 5 4</p> <p>E. There is no output due to a runtime error.</p>	<pre>while (!t.empty()) { System.out.print(<*1> + " "); }</pre>

QUESTION 31

What is output by the line marked `//1` in the code to the right?

- A. arrows
- B. hearts
- C. candies
- D. \$\$\$
- E. &

```
String x = "$$$arrows&hearts&candies$$$";
String[] group = x.split("\\p{Punct}");
```

QUESTION 32

What is output by the line marked `//2` in the code to the right?

- A. 4
- B. 3
- C. 9
- D. 6
- E. 5

```
System.out.println( group[4] ); //1
System.out.println( group.length ); //2
```

QUESTION 33

```
int[] a = {5,4,3,2,1,1,2,3,4,5};
```

What is returned by `why(a,4)`?

- A. -1
- B. 0
- C. 1
- D. 2
- E. 4

QUESTION 34

```
int[] a = {5,4,5,6,7,8,7,6};
```

What is returned by `why(a,7)`?

- A. -1
- B. 0
- C. 1
- D. 2
- E. 4

```
public static int why(int[] a, int x)
{
    int save = -1;
    for(int i=x-1;i>=0;i--)
    {
        if(a[i] > a[x])
            save = i;
    }
    return save;
}
```

QUESTION 35

What is the **best** case bigO for method `why`? Choose the most restrictive answer.

- A. $O(n)$
- B. $O(n/2)$
- C. $O(1)$
- D. $O(n-1)$
- E. $O(\log 2n)$

QUESTION 36

Assume that method `superSort(Object[] objs)` is $O(N^2)$ where $N = \text{obj.length}$. When method `superSort` is passed an Object array of length 10000 it takes 0.50 seconds for method `superSort` to complete. If method `superSort` is passed an Object array of length 20000, how many seconds would it take `superSort` to complete?

- A. 1.00
- B. 1.50
- C. 2.00
- D. 4.00
- E. 3.00

<p>QUESTION 37</p> <p>What is the output of the following?</p> <pre>Student stew = new Turing(); System.out.println(stew.ID);</pre> <p>A. beep B. 9000 C. 9001 D. 8999 E. There is no output due to a syntax error.</p>	<pre>public class Student{ public final int ID = 8999; public String sound(){ return "beep"; } }</pre>
<p>QUESTION 38</p> <p>What is the output of the following?</p> <pre>Student stew = new CSStudent(); System.out.println(stew.ID);</pre> <p>A. bop B. 9000 C. 9001 D. 8999 E. There is no output due to a syntax error.</p>	<pre>public class CSStudent extends Student{ private final int ID = 9000; public String sound(){ return "bop"; } }</pre>
<p>QUESTION 39</p> <p>What is the output of the following?</p> <pre>CSStudent stew = new Turing(); System.out.println(stew.ID);</pre> <p>A. boop B. 9000 C. 9001 D. bop E. There is no output due to a syntax error.</p>	<pre>public class Turing extends CSStudent{ public final int ID = 9001; public String sound(){ return "boop"; } }</pre>
<p>QUESTION 40</p> <p>What is the output of the code to the right?</p> <p>A. The apple hit me in the HEAD B. the HEAD C. The apple hit me in the KNEE D. The apple hit me in E. There is no output due to a syntax error.</p>	<pre>out.print("The apple hit me in"); try{ out.println(1/0); } catch(Exception e){ out.println(" the HEAD"); } catch(ArithmeticException e){ out.println(" the KNEE"); }</pre>