

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` 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	
$1101_2 + 111_2 = ?$ A. 11110_2 B. 11000_2 C. 10110_2 D. 22_{10} E. 17_{13}	
QUESTION 2	
What is output by the code to the right?	<pre>int a = 16; a = a + -7; System.out.println(a);</pre>
A. 8 B. 9 C. 10 D. 11 E. 12	
QUESTION 3	
What is output by the code to the right?	<pre>Integer b = 1; b += 2.2; System.out.println(b);</pre>
A. 2.2 B. 3 C. 3.2 D. 2 E. There is no output due to a syntax error.	
QUESTION 4	
What is output by the code to the right?	<pre>for(int c=2; c>-1; --c) System.out.print(c);</pre>
A. 2 B. 210-1 C. 210 D. 21 E. 10-1	
QUESTION 5	
What is output by the code to the right?	<pre>String d = "8 bits in a byte bud"; System.out.print(d.lastIndexOf('b'));</pre>
A. 0 B. -1 C. 3 D. 7 E. 17	
QUESTION 6	
What is output by the code to the right?	<pre>double[] eRay = {8.0,4,7.0,6,5.0}; System.out.println(eRay[5-5+1]);</pre>
A. 4.0 B. 4 C. 5 D. 6.0 E. 7	
QUESTION 7	
What is output by the code to the right?	<pre>boolean eBoola = false; eBoola = !eBoola; System.out.println(eBoola==true);</pre>
A. yes B. no C. eBoola D. true E. false	
QUESTION 8	
What is output by the code to the right?	<pre>int fNum = 1; if(fNum == 4); System.out.print(0); System.out.print(1);</pre>
A. 10 B. 01 C. 11 D. 0 E. 1	
QUESTION 9	
Which of the following replaces <*1> in the code to the right to correctly refer <code>jim</code> to a new instance of <code>Great</code> ?	<pre>public class Great { private int num; public Great(int n) { num=n; } } //////////////////////////////////// //client code Object jim = <*1></pre>
A. <code>new Great();</code> B. <code>new Great(3);</code> C. <code>new Object();</code> D. A and B only E. A, B, and C	

QUESTION 10 What is output by the code to the right? A. 10 B. 17 C. 13 D. 8 E. 12	<pre>System.out.println(10 ^ 7);</pre>
QUESTION 11 What is output by the code to the right? A. 7 B. 7.0 C. 8.0 D. 8 E. 7.9	<pre>System.out.println(Math.floor(7.9));</pre>
QUESTION 12 What is output by the code to the right? A. 13000 B. 13 C. 00013 D. 000013 E. 00000	<pre>System.out.printf("%05d",13);</pre>
QUESTION 13 What is output by the code to the right? A. 3 B. 2 C. 6 D. 1 E. 9	<pre>int[][] hMat = {{1,2}, {4,5,6,7,8,9}, {1}}; System.out.println(hMat[1].length);</pre>
QUESTION 14 What is output by the code to the right? A. 64 B. 108 C. 72 D. 96 E. 84	<pre>int iSum=0; for(int i=0; i<25; i=i+4) { iSum += i; } System.out.println(iSum);</pre>
QUESTION 15 What is output by the code to the right? A. i B. d C. w D. o E. r	<pre>String j = "gridworld"; System.out.print(j.charAt(4));</pre>
QUESTION 16 What is output by the code to the right? A. 72(3+3) B. 7233 C. 15 D. 726 E. There is no output due to a syntax error.	<pre>System.out.print(7 + "2" + (3 + 3));</pre>
QUESTION 17 What is output by the code to the right? A. 2 B. 5 C. 3 D. 0 E. 8	<pre>System.out.println(3 % 5);</pre>
QUESTION 18 What is output by the code to the right? A. false B. true C. stop D. 0 E. 1	<pre>boolean k = false, m = true; System.out.println(k (m && k));</pre>
QUESTION 19 What is output by the code to the right? A. 40 B. 10 C. 20 D. 35 E. There is no output due to a syntax error.	<pre>ArrayList<Integer> n; n = new ArrayList<Integer>(); n.add(new Integer("5")); n.add(2); n.add(4); int ans = 1; for(int fun : n) ans = ans * fun; System.out.println(ans);</pre>

QUESTION 20 What is output by the code to the right? A. 4.5 B. 4 C. 4.0 D. 4.25 E. 5.0	<pre>double dbl = 9/Math.round(2.4); System.out.println(dbl);</pre>
QUESTION 21 What is output by the code to the right? A. 10.5 B. 11 C. 11.0 D. 11.5 E. There is no output due to a syntax error.	<pre>double pNum = 2.5; do{ if(pNum==8.0) continue; pNum += 3; }while(pNum < 11.5); System.out.println(pNum);</pre>
QUESTION 22 What is returned by the method call what(10) ? A. -1 B. 2 C. 3 D. 4 E. 5	<pre>public static int what(int x) { if(x>0 && x<=10) return x-5; else if(x>=10 && x<=20) return x-6; else if(x>=20 && x<=30) return x-7; else return -1; }</pre>
QUESTION 23 What is returned by the method call what(20) ? A. 15 B. 14 C. 13 D. 20 E. -1	
QUESTION 24 What is output by the line marked //1 in the client code to the right? A. 8 B. 1 C. 2 D. 8.0 E. 1.0	<pre>public class Thang{ private int num; public Thang(int n){ setNum(n); } public void setNum(int n){ num=n; } public double getNum(){ return num; } } public class Bug extends Thang{ private double num; public Bug(int d){ super(2); num = d; } public double getNum(){ return num; } }</pre>
QUESTION 25 What is output by the line marked //2 in the client code to the right? A. 3 B. 1 C. 2 D. 3.0 E. 1.0	
QUESTION 26 What is output by the line marked //3 in the client code to the right? A. 3 B. 1 C. 2 D. 3.0 E. 1.0	<pre>//////////////////////////////////// //client code Thang one = new Thang(8); out.println(one.getNum()); //1 Thang two = new Bug(1); out.println(two.getNum()); //2 two.setNum(3); out.println(two.getNum()); //3</pre>

<p>QUESTION 27</p> <p>What is output by the line marked <code>//1</code> in the code to the right?</p> <p>A. 0 B. 5 C. 10 D. 9 E. error</p>	<pre>ArrayList<Integer> intList; intList = new ArrayList<Integer>(); for(int i=0; i<10; i++) intList.add(i);</pre>
<p>QUESTION 28</p> <p>What is output by the line marked <code>//2</code> in the code to the right?</p> <p>A. 0 B. 5 C. 10 D. 9 E. error</p>	<pre>out.println(intList.size()); //1 for(int i=0; i<intList.size(); i++){ if(intList.get(i)%2==0) intList.remove(i); } out.println(intList.size()); //2</pre>
<p>QUESTION 29</p> <p>What is returned by the method call <code>wow(7)</code> ?</p> <p>A. 7 B. 9 C. 10 D. 11 E. 14</p>	<pre>public static int wow(int x) { if(x>0) return x/2 + wow(x-3); else return 2; }</pre>
<p>QUESTION 30</p> <p>What is returned by the method call <code>wow(11)</code> ?</p> <p>A. 7 B. 9 C. 10 D. 11 E. 14</p>	
<p>QUESTION 31</p> <p>What is output by the code to the right?</p> <p>A. 96 B. 48 C. 192 D. 24 E. 14</p>	<pre>System.out.println(3<<7>>4<<2);</pre>
<p>QUESTION 32</p> <p>What type of tree traversal is shown by the code to the right?</p> <p>A. in-order traversal B. post-order traversal C. pre-order traversal D. reverse-order traversal E. level-order traversal</p>	<pre>public void print(TreeNode tree) { if(tree != null) { out.println(tree.getValue()); print(tree.getLeft()); print(tree.getRight()); } }</pre>
<p>QUESTION 33</p> <p>What is output by the line marked <code>//1</code> in the code to the right?</p> <p>A. 8.5 B. 1.5 C. 2.3 D. 7.1 E. 9.9</p>	<pre>Map<String, Double> map; map = new TreeMap<String, Double>(); map.put("bug", 2.3); map.put("dog", 8.5); map.put("cat", 3.1); map.put("cat", 9.9); map.put("dog", 1.5); map.put("cat", 7.1);</pre>
<p>QUESTION 34</p> <p>What is output by the line marked <code>//2</code> in the code to the right?</p> <p>A. 0.0 B. 7.1 C. 1.5 D. null E. There is no output due to a runtime error.</p>	
<p>QUESTION 35</p> <p>What is output by the line marked <code>//3</code> in the code to the right?</p> <p>A. [2.3, 8.5, 3.1, 9.9, 1.5, 7.1] B. [2.3, 1.5, 7.1] C. [2.3, 7.1, 8.5] D. [2.3, 7.1, 1.5] E. [2.3, 8.5, 7.1]</p>	<pre>out.println(map.get("dog")); //1 out.println(map.get("pig")); //2 Collection vals = map.values(); out.println(vals); //3</pre>

QUESTION 36

Which of the following replaces **<*1>** in the test code to the right so that method `test` will run without error?

- A. 7
- B. `ray.length`
- C. `ray.length+1`
- D. `ray.size-1`
- E. `ray.length-1`

```
public class What
{
    public static int test(int[] ray)
    {
        int cnt = 0;
        for(int i=0; i< <*1> ; i++)
        {
            if(ray[i]>ray[i+1])
                cnt++;
        }
        return cnt;
    }
}
```

QUESTION 37

Assuming **<*1>** has been filled correctly, what is output by the line marked `//1` in the client code to the right?

- A. 7
- B. 5
- C. 4
- D. 6
- E. 3

```
//////////////////////////////////////////
//client code
int[] stuff = {9,8,17,6,2,0,11};
out.println(What.test(stuff)); //1
```

QUESTION 38

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 0.05 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. 0.010
- B. 0.10
- C. 0.05
- D. 0.20
- E. 0.025

QUESTION 39

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

- A. h
- B. ero
- C. s
- D. ro
- E. un23strou

```
String x = "heroesfun23stroud21";
String[] list = x.split("[a-f&[^h]]");
```

QUESTION 40

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

- A. 3
- B. 5
- C. 4
- D. 6
- E. 7

```
out.println(list[2]); //1
out.println(list.length); //2
```