

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

What is 101_2 plus 44_{10} ?

- A. 49_{10} B. 49_5 C. 145_{10} D. 46_6 E. 54_{10}

QUESTION 2

What is output by the code to the right?

- A. 4 B. 4.5 C. 7 D. 7.0
E. There is no output due to a syntax error.

```
int a = 5 + 4 / 2;
System.out.println(a);
```

QUESTION 3

What is output by the code to the right?

- A. 18 B. 80 C. 56 D. 56.0
E. There is no output due to a syntax error.

```
double b = 8;
b += '0';
System.out.println(b);
```

QUESTION 4

What is output by the code to the right?

- A. 159 B. 11321
C. 151321 D. 191721
E. 159131721

```
int c = 0;
for(c=1; c<24; c=c+3)
{
    System.out.print(c);
    c=c+1;
}
```

QUESTION 5

What is output by the code to the right?

- A. 0 B. -1 C. true D. false E. no

```
String d = "goet-dome-teaf";
System.out.print(d.contains("t-t"));
```

QUESTION 6

What is output by the code to the right?

- A. 0 B. 1 C. 3 D. 5 E. 2

```
long[] ray = {1,5,6,3,2};
ray[1]=ray[0]+ray[2]+ray[3];
System.out.println(ray[1]/ray[2]);
```

QUESTION 7

What is output by the code to the right?

- A. yes B. no
C. maybe D. true
E. false

```
boolean sam = false;
boolean ben = true;
ben = sam;
ben = !!ben || sam;
System.out.println(ben);
```

QUESTION 8

What is output by the code to the right?

- A. 4
B. 24
C. 246
D. 426
E. 26

```
int theNum = 5;
if(theNum>1)
    System.out.print(4);
if(theNum>2)
    System.out.print("2");
if(theNum>3)
    System.out.print("6");
```

QUESTION 9

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

- A. 10.0
- B. 20.0
- C. 40.0
- D. 80.0
- E. There is no output due to a syntax error.

```
public class LightBulb
{
    private double watts;

    public LightBulb(double w){
        watts = w;
    }

    public void brighter(){
        watts = watts * 2;
    }

    public void dimmer(){
        watts = watts / 2;
    }

    public double getWatts(){
        return watts;
    }
}

////////////////////////////////////
//client code
LightBulb bub = new LightBulb(10);
bub.brighter();
bub.brighter();
System.out.println(bub.getWatts()); //1
bub.dimmer();
System.out.println(bub.getWatts()); //2
```

QUESTION 10

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

- A. 10.0
- B. 20.0
- C. 40.0
- D. 80.0
- E. There is no output due to a syntax error.

```
(int) (Math.random()*10)+5
```

QUESTION 11

What range of values could the code at right generate?

- A. 5-15 B. 4-15 C. 5-14 D. 0-15 E. 0-10

QUESTION 12

What is output by the code to the right?

- A. 00000007 B. 087
- C. 70000000 D. 708
- E. There is no output due to a syntax error.

```
System.out.printf("08%d",7);
```

QUESTION 13

What is output by the code to the right?

- A. true B. 3
- C. false D. 7
- E. There is no output due to an `IndexOutOfBoundsException`.

```
int[][] iMat = {{3,5,7},{7,5,3}};
int end = iMat.length;
boolean mb;
mb = iMat[0][0] == iMat[end][end];
out.println(mb);
```

QUESTION 14

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

- A. 7
- B. 6
- C. 9
- D. 8
- E. 5

```
public static int doIt(String word)
{
    int cnt = 0;
    for(char c : word.toCharArray())
        if(Character.isDigit(c))
            cnt++;
    return cnt;
}

////////////////////////////////////
//client code
out.println(doIt("d3a35a98dsf97")); //1
```

<p>QUESTION 15</p> <p>What is output by the code to the right?</p> <p>A. 5 B. 6 C. 7 D. -1 E. 0</p>	<pre>String j = "beyondthesea"; System.out.print(j.indexOf("the"));</pre>
<p>QUESTION 16</p> <p>What is output by the code to the right?</p> <p>A. 6 B. 4 C. 0 D. 3 E. 8</p>	<pre>int bug = 3; switch(bug){ case 2 : bug = 4; break; case 3 : bug = 6; break; case 4 : bug = 8; break; case 5 : bug = 0; } System.out.println(bug);</pre>
<p>QUESTION 17</p> <p>What is output by the code to the right?</p> <p>A. 7 B. 2 C. 5 D. 4 E. 0</p>	<pre>int ter = 7>2?3+2:2+2; System.out.println(ter);</pre>
<p>QUESTION 18</p> <p>What is output by the code to the right?</p> <p>A. false B. true C. stop D. 0 E. 1</p>	<pre>boolean k=true, m=true, p=false; System.out.println(k && !(m && p));</pre>
<p>QUESTION 19</p> <p>What is output by the code to the right?</p> <p>A. [4, 5, 3] B. [3, 5, 4] C. [3, 4, 5] D. [3, 3, 3] E. There is no output due to a runtime error.</p>	<pre>ArrayList<Integer> bunch; bunch = new ArrayList<Integer>(); bunch.add(4); bunch.add(new Integer(5)); bunch.add(new Integer("3")); Collections.sort(bunch); System.out.println(bunch);</pre>
<p>QUESTION 20</p> <p>What is output by the code to the right?</p> <p>A. 5.0 B. 4.5 C. 2.5 D. 5.20 E. 9.0</p>	<pre>double dbl = Math.pow(3,1.5); System.out.printf("%.2f",dbl);</pre>
<p>QUESTION 21</p> <p>What is output by the code to the right?</p> <p>A. 2 B. 4 C. 9 D. 5 E. 7</p>	<pre>System.out.println(3 ^ 5 & 4);</pre>
<p>QUESTION 22</p> <p>What is returned by the method call <code>what(new int[]{3,1,2,5,-3,0,1,0})</code> ?</p> <p>A. 8 B. 6 C. 5 D. 7 E. 2</p>	<pre>public static int what(int[] x) { int back=0; for(int it : x) { for(int h=0; h<=it; h++) ++back; for(int h=0; h<it; h++) --back; } return back; }</pre>
<p>QUESTION 23</p> <p>What is returned by the method call <code>what(new int[]{0,1,-1,0,-1,2,1})</code> ?</p> <p>A. 8 B. 6 C. 5 D. 7 E. 2</p>	

QUESTION 24

Method go is which standard sorting algorithm?

- A. bubble sort
- B. quick sort
- C. merge sort
- D. selection sort
- E. insertion sort

```
public class FunHouse
{
    public static void go(int[] a)
    {
        for(int i=0; i<a.length-1; i++)
        {
            int big = i;
            for(int j=i; j<a.length; j++)
            {
                if(a[j]>a[big])
                    big=j;
            }
            int move = a[i];
            a[i] = a[big];
            a[big] = move;
        }
    }
}
```

QUESTION 25

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

- A. 1
- B. 9
- C. 8
- D. 4
- E. 5

```
////////////////////////////////////
//client code
int[] br = {3,5,6,1,2,8,9,4};

FunHouse.go(br);

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

QUESTION 26

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

- A. 1
- B. 9
- C. 8
- D. 4
- E. 5

QUESTION 27

What is output by the code to the right when given this input?
23 dog 22 cat

- A. 23 dog
- B. 23dog
- C. 22cat
- D. 23dog22cat
- E. There is no output due to a runtime error.

```
Scanner kb = new Scanner(System.in);

System.out.print(kb.next());
System.out.print(kb.nextInt());
```

QUESTION 28

What is output by the code to the right when given this input?
23 dog 22 cat

- A. 23 dog
- B. 23dog
- C. 22cat
- D. 23dog22cat
- E. There is no output due to a runtime error.

```
Scanner kb = new Scanner(System.in);

System.out.print(kb.nextInt());
System.out.print(kb.next());
```

QUESTION 29

What is returned by the method call wow(3) ?

- A. 13
- B. -1
- C. 8
- D. 24
- E. 17

```
public static int wow(int x)
{
    if(x<0)
        return 1;
    else
        return wow(x-1) + wow(x-2);
}
```

QUESTION 30

What is returned by the method call wow(4) ?

- A. 13
- B. -1
- C. 8
- D. 24
- E. 17

QUESTION 31

Which of the following could replace **<*1>** in the code to the right so that method `isIt` would determine if parameter `t` has no children?

- A. `t.getRight() == null && t.getLeft() == null`
- B. `t.getRight() != null && t.getLeft() != null`
- C. `t.getRight() == null || t.getLeft() == null`
- D. `t == null`
- E. more than one of these

```
public boolean isIt(TreeNode t)
{
    return ( <*1> );
}

public int run(TreeNode t)
{
    if(t==null) return 0;
    if(isLeaf(t)) return 1;
    return run(t.getLeft()) +
           run(t.getRight());
}
}
```

QUESTION 32

What is method `run` attempting to determine about a tree?

- A. if the tree is empty
- B. the number of children in the tree
- C. the number of leaves in the tree
- D. the number of parents in the tree
- E. the number of empty nodes in the tree

QUESTION 33

Which of the following could replace **<*1>** in the code to the right so that `stack` would refer to a `Stack` object?

- A. `Stack<Integer>();`
- B. `Stack();`
- C. `new Stack<Integer>();`
- D. `new stack();`
- E. more than one of these

```
Map<String, Integer> map;
map = new TreeMap<String, Integer>();

Stack<Integer> stack = <*1>
```

```
map.put("q", 4);
map.put("w", 7);
map.put("e", 8);
map.put("r", 2);
map.put("t", 3);
map.put("y", 6);
```

```
for(String sym : map.keySet())
    stack.add(map.get(sym));
```

```
out.println(stack.pop()); //1
out.println(stack.peek()); //2
```

QUESTION 34

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

- A. 8
- B. 7
- C. 4
- D. 2
- E. 6

QUESTION 35

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

- A. 8
- B. 7
- C. 4
- D. 2
- E. 6

QUESTION 36

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

- A. 8
- B. 7
- C. 4
- D. 6
- E. There is no output due to a runtime error.

```
ArrayList<Integer> goods;
goods = new ArrayList<Integer>();

Integer[] one = {1,2,7,8};
Integer[] two = {2,4,6,8};
```

```
goods.addAll(Arrays.asList(one));
goods.addAll(Arrays.asList(two));
System.out.println(goods.size()); //1
```

```
goods.removeAll(Arrays.asList(one));
System.out.println(goods); //2
```

QUESTION 37

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

- A. `[1, 2, 7, 8]`
- B. `[2, 4, 6, 8]`
- C. `[4, 6]`
- D. `[1, 2, 7, 8, 2, 4, 6, 8]`
- E. There is no output due to a runtime error.

QUESTION 38

Assume that method `superSort(Object[] objs)` is $O(N)$ where $N = \text{obj.length}$. When method `superSort` is passed an Object array of length 10000 it takes 0.20 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. 0.10
- B. 0.30
- C. 0.60
- D. 0.40
- E. 0.80

QUESTION 39

Which of the following replaces **<*1>** in the build code to the right so that `len` will be assigned the sum of `x`'s length and `y`'s length?

- A. `x.length + y.length;`
- B. `x.length`
- C. `x.length() + y.length();`
- D. `y.length * 2`
- E. `x.size() + y.size();`

```
public class What
{
    //method build will return an array
    //that contains the combined values
    //of array parameters x and y

    public int[] build(int[] x, int[] y)
    {
        int len = <*1>
        int[] back = new int[len];
        int j=0, k=0;
        for(int i=0; i<back.length; i++)
        {
            if(j < x.length)
                <*2> = x[j++];
            else if(k < y.length)
                <*2> = y[k++];
        }
        return back;
    }
}
```

QUESTION 40

Which of the following replaces **<*2>** in the build code to the right so that `back` will be assigned each value from `x` and each value from `y`?

- A. `back[i]`
- B. `back[j+k]`
- C. `back[k]`
- D. A and B only
- E. A, B, and C only