

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 10001_2 plus 1010_2 ?

- A. 11010_2 B. 11001_2 C. 10101_2 D. $1A_{16}$ E. 27_{10}

QUESTION 2

What is output by the code to the right?

- A. 3.0 B. 4.5 C. 4.0 D. 5.0

E. There is no output due to a syntax error.

```
Double b = 10.0 - 7;
b++;
out.println( b );
```

QUESTION 3

What is output by the code to the right?

- A. 75 B. 25 C. 0 D. 50 E. 26

```
int cnt = 0;
for(int i = 0; i < 75; i=i+3){
    cnt = cnt + 1;
}
out.print( cnt );
```

QUESTION 4

What is output by the code to the right?

- A. 1776 B. birdy
C. birdy1776 D. that1776
E. what

```
String that = "birdy";
String what = that + 1776;
out.print( what );
```

QUESTION 5

What is output by the code to the right?

- A. 2.0 B. 2.25 C. 2.5 D. 3.33 E. 4.0

```
double[] buk = {10,5,3,1,0,-1,-2};
out.printf("%.2f", buk[0]/buk[2] );
```

QUESTION 6

What is output by the code to the right?

- A. 6 36 B. 6 30 C. 7 36 D. 7 30 E. 6 25

```
int x = 5;
int y = ++x * x;
out.print( x + " " + y );
```

QUESTION 7

How many combinations of values for the `boolean` variables `a` and `b` will result in `c` being set to `true`?

- A. 2 B. 7 C. 1 D. 3 E. 0

```
boolean a, b;
//code to initialize a and b

boolean c = !a || !b;
```

QUESTION 8

What is output by the code to the right?

- A. 4 B. 13 C. 1 D. 24 E. 14

```
int j = 3;
String s = "hooagie";
if( s.charAt(j) == 'a' )
    out.print( 1 );
else
    out.print( 2 );
if( s.charAt(j) == 'n' )
    out.print( 3 );
else
    out.print( 4 );
```

QUESTION 9

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

- A. 0
- B. 1
- C. true
- D. false
- E. There is no output due to a syntax error.

```
public class Ogre{
    public boolean smellsReallyBad;
    public double speed;

    public Ogre(double sp){
        smellsReallyBad = false;
        speed = sp;
    }

    public void setSmelly( boolean b){
        smellsReallyBad = b;
    }

    public boolean isFast(){
        if( smellsReallyBad && speed>25 )
            return true;
        if( speed > 50 )
            return true;
        return false;
    }
}

////////////////////////////////////
// client code
Ogre guy = new Ogre(48.3);
out.println(guy.isFast()); //1
guy.setSmelly(true);
out.println(guy.isFast()); //2
```

QUESTION 10

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

- A. 0
- B. 1
- C. true
- D. false
- E. There is no output due to a syntax error.

```
int goo = 7;
int monst = goo << 3;
out.print( monst );
```

QUESTION 11

What is output by the code to the right?

- A. 56
- B. 28
- C. 20
- D. 7
- E. 14

QUESTION 12

What is output by the code to the right?

- A. 4
- B. 6
- C. 12
- D. 7
- E. 10

```
int one = 4;
int two = one * 3 / 2;
out.print(Math.max( one, two));
```

QUESTION 13

What is output by the code to the right?

- A. whatthelper
- B. wh\\att\\hel\\per
- C. wh\att\hel\per
- D. wh\att\helper
- E. There is no output due to a syntax error.

```
String guess = "wh\\att\\hel\\per";
out.print( guess );
```

QUESTION 14

What is output by the code to the right?

- A. 8.23
- B. 000008.23
- C. 008.24
- D. 008.23
- E. 008.240

```
out.printf("%06.2f", 8.234);
```

<div>QUESTION 15</div> <div>What is returned by the method call <code>test(10, 7.0)</code>?</div> <div>A. 1.0 B. 2.0</div> <div>C. 2.5 D. 3.0</div> <div>E. There is no output due to a syntax error.</div>	<pre>public double test(long a, float b){ a*=2; a = a / b / 2; return a; }</pre>
<div>QUESTION 16</div> <div>What is output by the client code to the right?</div> <div>A. [4, 6, 9]</div> <div>B. [1, 0, 2]</div> <div>C. [3, 6, 9]</div> <div>D. [4, 6, 9, 0]</div> <div>E. [0, 0, 0, 0]</div>	<pre>public void fun(int[] list){ list = new int[4]; list[0]++; } // client code int[] vals = {3, 6, 9}; fun(vals); out.print(Arrays.toString(vals));</pre>
<div>QUESTION 17</div> <div>Which of the following types could be assigned the value 217?</div> <div>A. char B. int C. float D. short E. more than one of these</div>	
<div>QUESTION 18</div> <div>What is output by the code to the right?</div> <div>A. false false B. true false</div> <div>C. false true D. true true</div> <div>E. false</div>	<pre>String sam = "scary"; String ben = "scary"; String wil = ben + sam; out.print(sam == ben); out.print(" " + (sam == wil));</pre>
<div>QUESTION 19</div> <div>What is output by the line marked <code>//1</code> to the right?</div> <div>A. 105</div> <div>B. 15</div> <div>C. 30</div> <div>D. 537</div> <div>E. 5</div>	<pre>int ogre = 735; int big = 1; while(ogre > 0){ big = big * (ogre % 10); ogre = ogre /10; } out.println(big); //1 out.println(ogre); //2</pre>
<div>QUESTION 20</div> <div>What is output by the line marked <code>//2</code> to the right?</div> <div>A. 3</div> <div>B. 1</div> <div>C. 7</div> <div>D. 5</div> <div>E. 0</div>	
<div>QUESTION 21</div> <div>Which of the following is a not a primitive data type in Java?</div> <div>A. float B. long C. char D. Byte E. double</div>	

QUESTION 22

Which of the following could replace **<*1>** in the code to the right so that method `getIt` can return a list of integers?

- A. `LinkedList` B. `ArrayList<Integer>`
C. `Object[]` D. `Integer[]`
E. `int[]`

Assume **<*1>** has been filled in correctly.

QUESTION 23

What is the intended purpose of method `getIt`?

- A. It returns a list of all digits in `num`.
B. It returns a list of all even factors of `num`.
C. It returns a list of all odd factors of `num`.
D. It returns a list of all factors of `num`.
E. It returns a list of some of the factors of `num`.

```
public <*1> getIt(int num){
    ArrayList<Integer> it;
    it = new ArrayList<Integer>();
    for(int i = 1; i <= num; i++)
        if( num % i == 0 )
            it.add( i );
    return it;
}
```

QUESTION 24

What is output by the code to the right?

- A. 300 B. 120 C. 210 D. 30 E. 220

```
int[] pri = {1, 2, 3, 5, 7};
int bomb = 1;
for(int dig : pri)
    bomb *= dig;
out.print(bomb);
```

QUESTION 25

What is output by the code to the right?

- A. `at` B. `up` C. `in`
D. There is no output due to a syntax error.
E. There is no output due to a runtime error.

```
String funny = "3is7at9uplin2space";
String[] whoot = funny.split("\\d");
out.println( whoot[2] );
```

QUESTION 26

What is output by the following client code?

```
int[] values = {9, 5, 11, 2, 7};
sort(values);
out.print(Arrays.toString(values));
```

- A. `[2, 9, 5, 11, 7]` B. `[7, 5, 2, 11, 9]`
C. `[11, 5, 9, 2, 5]` D. `[2, 5, 7, 9, 11]`
E. `[5, 2, 9, 11, 7]`

```
public static void sort(int[] stuff)
{
    for(int i = 1; i < stuff.length; i++)
    {
        int j = i;
        while(j > 0 &&
            stuff[j] < stuff[j - 1])
        {
            int temp = stuff[j - 1];
            stuff[j - 1] = stuff[j];
            stuff[j] = temp;
            j--;
        }
    }
}
```

QUESTION 27

Which sorting algorithm does method `sort` implement?

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

QUESTION 28

Which of the following replaces **<*1>** in the code to the right so that the value of `mess` is doubled each iteration of the loop?

- A. `mess = mess << 1;`
- B. `mess *= 2;`
- C. `mess = mess * 2;`
- D. `mess = mess + mess;`
- E. more than one of these

```
int stop = 7;
int mess = 1;
for(int i = 1; i < stop; i++)
{
    <*1>
}
out.println(mess);
```

QUESTION 29

Assuming that **<*1>** is filled correctly, what is output by the code to the right?

- A. 16
- B. 64
- C. 128
- D. 8
- E. 32

QUESTION 30

What is output by the code to the right?

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

```
Object o = "tricks and treats";
out.print( o instanceof Comparable );
```

QUESTION 31

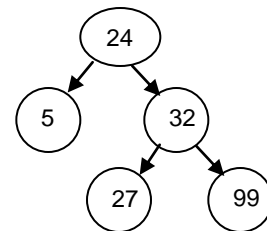
Assume the method `getDown(int[] data)` is $O(N)$ where $N = \text{data.length}$. When the method `getDown` is passed an array with `length = 100,000` it takes 8 seconds for method `getDown` to complete. If method `getDown` is then passed an array with `length = 75,000` what is the expected time it will take method `getDown` to complete?

- A. 16 seconds
- B. 1 second
- C. 6 seconds
- D. 2 seconds
- E. 4 seconds

QUESTION 32

Consider the tree to the right. What kind of tree is it?

- A. A min heap
- B. A red black tree
- C. A hash table
- D. A max heap
- E. A binary search tree



QUESTION 33

Given the graph at right, how many edges are present?

- A. 8 B. 10 C. 9 D. 11 E. 6

QUESTION 34

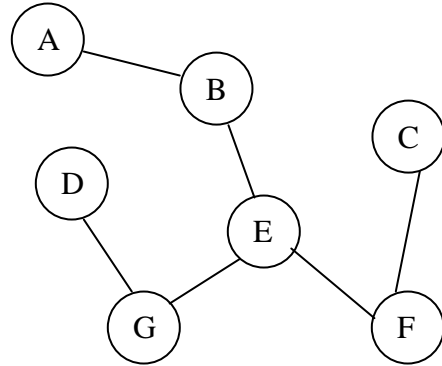
Given the graph at right, how many vertices are present?

- A. 11 B. 9 C. 7 D. 10 E. 8

QUESTION 35

Given the graph at right, how many neighbors does E possess?

- A. 2 B. 3 C. 4 D. 1 E. 5


QUESTION 36

The following values are inserted one at a time in the order shown into a binary search tree using a standard insertion algorithm.

60 80 70 50 20

What is the result of a preorder traversal of the resulting tree?

- A. 60 80 70 50 20 B. 20 60 70 80 50
C. 90 80 70 60 50 D. 60 50 20 80 70
E. 70 80 20 50 60

QUESTION 37

How many leaves are there in the tree resulting from question 36?

- A. 5 B. 0 C. 2 D. 1 E. 4

QUESTION 38

How many stars are printed by `master(10)`?

- A. 215 B. 219
C. 210 D. 211
E. 212

```
public void master( int x )
{
    if(x==1) return;
    for(int i = 0; i < x; i++){
        for(int k = 0; k < x; k++){
            System.out.println("*");
        }
    }
    master( x / 2 );
    master( x / 2 );
    master( x / 2 );
}
```

QUESTION 39

What is the Big-O running time of `master`?

- A. $O(\log n)$ B. $O(n)$
C. $O(n \log n)$ D. $O(n^2)$
E. $O(3^n)$

QUESTION 40

What is output by the code to the right?

- A. truefalse B. falsetrue
C. truetrue D. falsefalse
E. There is no output due to a syntax error.

```
String s1 = "ja+k";
String s2 = "jill";
String s3 = "j[^d-k]+k";
out.print(s1.matches(s3));
out.print(s1.matches(s2));
```