

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 111_8 plus 111_8 ?	
A. 401_6 B. 10010001_2 C. 10010011_2 D. 232_8 E. 2102_4	
QUESTION 2	
What is output by the code to the right?	<pre>int a = 5 * 6 + 6; System.out.println(a);</pre>
A. 60 B. 17 C. 36 D. 66 E. 30	
QUESTION 3	
What is output by the code to the right?	<pre>int b = 6; int c = ++b; System.out.println(c);</pre>
A. 5 B. 7 C. 4 D. 6 E. 0	
QUESTION 4	
What is output by the code to the right?	<pre>String d = "fun"; String let = d + d.charAt(2); System.out.print(let);</pre>
A. dfun B. nfun C. funn D. dfun E. There is no output due to a syntax error.	
QUESTION 5	
What is output by the code to the right?	<pre>int[] array = {2, 4, 3, 1, 5}; System.out.print(array[4] + 3);</pre>
A. 8 B. 6 C. 7 D. 5 E. 9	
QUESTION 6	
What is output by the code to the right?	<pre>int e = 5; double f = 7.5; e -= f; System.out.print((int)e);</pre>
A. -2.5 B. 2 C. 2.5 D. -2 E. There is no output due to a runtime error.	
QUESTION 7	
What is output by the code to the right?	<pre>boolean g = true; boolean i = false; boolean h = g && (!i ^ !g); System.out.println(h);</pre>
A. true B. 1 C. false D. 0 E. There is no output due to a runtime error.	
QUESTION 8	
What is output by the code to the right?	<pre>int k = 5; int m = 5; if (k * m < 20) System.out.print(0); if (k * 7 > m * 5) System.out.print(1); System.out.print(2);</pre>
A. 013 B. 03 C. 012 D. 3 E. 12	

<p>QUESTION 9</p> <p>Which of the following could replace <*1> in the client code at right?</p> <p>A. new Winner("st", 1);</p> <p>B. new Winner(2, "nd");</p> <p>C. new Winner(4);</p> <p>D. A and B only</p> <p>E. A, B, and C</p>	<pre>public class Winner { private String suffix; private int place; public Winner(String s, int p) { place = p; suffix = s; } public String toString() { return place + suffix; } }</pre> <p>////////////////////////////////////</p> <p>//client code</p> <p>Winner t = <*1></p>
<p>QUESTION 10</p> <p>What type of method is method toString()?</p> <p>A. modifier</p> <p>B. fixerupper</p> <p>C. accessor</p> <p>D. A and B only</p> <p>E. A, B, and C</p>	
<p>QUESTION 11</p> <p>What is output by the code to the right?</p> <p>A. cybersecurity</p> <p>B. cyber</p> <p>C. security</p> <p>D. cybercyber</p> <p>E. csecurity</p>	<pre>System.out.print("cybersecurity");</pre>
<p>QUESTION 12</p> <p>What is output by the code to the right?</p> <p>A. 3</p> <p>B. -1</p> <p>C. -2</p> <p>D. 2</p> <p>E. -3</p>	<pre>int shift = -10; System.out.print(shift>>2);</pre>
<p>QUESTION 13</p> <p>What is output by the client code to the right?</p> <p>A. -1</p> <p>B. 5</p> <p>C. 6</p> <p>D. There is no output due to a syntax error in the code.</p> <p>E. There is no output due to a runtime error.</p>	<pre>public static String su(String a) { return "prefix" + a + "postfix"; }</pre> <p>////////////////////////////////////</p> <p>//client code</p> <pre>String first = "wilE"; String second = su(first); System.out.print(second.indexOf(first));</pre>

<p>QUESTION 14</p> <p>What is output by the line marked <code>//1</code> in the client code to the right?</p> <p>A. 1 B. 0 C. -1 D. 32 E. -32</p>	<pre>public static int doIt(String word) { int end = word.length()-1; return word.charAt(0) - word.charAt(end); } //////////////////////////////////// //client code out.println(doIt("ABba")); //1</pre>
<p>QUESTION 15</p> <p>What is output by the code to the right?</p> <p>A. 16 B. 17 C. 18 D. 19 E. 20</p>	<pre>String j = "districtiscomingsoon"; System.out.print(j.lastIndexOf("o"));</pre>
<p>QUESTION 16</p> <p>Which of the following values could be assigned to <code>bug</code> by the code at right?</p> <p>A. 4 B. 2 C. 8 D. A and B only E. A, B, and C</p>	<pre>int bug = (int)(Math.random()*10); switch(bug){ case 2 : bug = bug + 2; break; case 4 : bug = bug / 2; break; case 8 : bug = bug * 2; break; case 10 : bug = bug - 2; break; }</pre>
<p>QUESTION 17</p> <p>What is output by the code to the right?</p> <p>A. 10 B. 0 C. 5 D. -5 E. -0</p>	<pre>int r = 100; do { r = r - 5; }while(r >= 0); System.out.println(r);</pre>
<p>QUESTION 18</p> <p>Which of the following can NOT be used in a <code>switch</code> statement?</p> <p>A. short B. Integer C. byte D. long E. char</p>	
<p>QUESTION 19</p> <p>What is output by the code to the right?</p> <p>A. [5, 5, 4, 4, 2, 1] B. [6, 5, 4, 3, 2, 1] C. [0, 1, 2, 3, 4, 5] D. [5, 4, 3, 2, 1, 0] E. There is no output due to a runtime error.</p>	<pre>int[] ar = {5,4,3,2,1,0}; for (int a = 0; a < ar.length; a++) ar[ar[a]]++; out.println(Arrays.toString(ar));</pre>

QUESTION 20

What is **NOT** a possible output by the code to the right?

- A. 7
- B. 4
- C. 1
- D. 11
- E. more than one of these

```
public static int c(int n){
    int sum = -2;
    switch(n){
        case 1: sum+=2*n;
        case 2: sum-=n+4;
        case 3: sum+=42%n;
        default: sum+=9;
    }
    return sum--;
}
```

QUESTION 21

Why can the method `sort` sort the array passed from the method `clientCode` without reassigning the array to a returned value?

- A. `clientCode` is in the same file as `sort`.
- B. `list` in `clientCode` shares the same name as in `sort`.
- C. Arrays are passed by value.
- D. Arrays are passed by reference.
- E. This is a logic error, as the array is not actually sorted.

QUESTION 22

What is the output by the code to the right when method `clientCode` is called?

- A. 254392145
- B. 235454921
- C. 234554291
- D. 254539214
- E. 254492513

```
public static void sort(int[] list, int k){
    int m = 0;
    for(int i = 1; i < list.length; i++)
    {
        m++;
        if(m == k)
            return;
        int q = list[i];
        int j = i - 1;
        for(; j >= 0 && q < list[j]; j--)
            list[j+1] = list[j];
        list[j+1] = q;
    }
}
```

QUESTION 23

What sorting algorithm is implemented by method `sort`?

- A. Mergesort
- B. Quicksort
- C. Bubble sort
- D. Insertion sort
- E. Selection sort

```
public static void clientCode(){
    int[] list = {3,2,5,4,5,4,9,2,1};
    sort(list,3);
    for(int t: list){
        System.out.print( t );
    }
}
```

QUESTION 24

If the value of parameter `k` is greater than the length of `list`, and an array of integers in random order is passed in, what is the expected running time of method `sort`? Choose the most restrictive correct answer.

- A. $O(N \log N)$
- B. $O(N)$
- C. $O(N^3)$
- D. $O(1)$
- E. $O(N^2)$

QUESTION 25

What is the output by the method call `whoot(5, 6)`?

- A. 10
- B. -13
- C. -19
- D. -25
- E. 7

```
public static int whoot(int a, int b){
    if(b <= 0)
        return 1;
    if(a % 2 == 0)
        return whoot(a - 2, b - 1) + -b;
    else
        return whoot(a - 1, b - 1) - a;
}
```

QUESTION 26

Which of the following could replace `<*1>` in the code to the right so that `names` and `it` could only refer to `String` objects?

- A. `<String>`
- B. `(String)`
- C. `[String]`
- D. `{String}`
- E. `-String-`

```
LinkedList<*1> names;
names = new LinkedList<*1> ();

names.addFirst("Percy");
names.addFirst("Thomas");
names.addLast("Gordon");
names.addLast(names.removeFirst());
names.addLast("Diesel_10");
names.addFirst("Emily");
```

Assume question 26 was filled correctly.

QUESTION 27

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

- A. `[Percy, Thomas, Emily, Gordon, Diesel_10]`
- B. `[Percy, Thomas, Gordon, Diesel_10, Emily]`
- C. `[Emily, Percy, Gordon, Thomas, Diesel_10]`
- D. `[Emily, Percy, Thomas, Gordon, Diesel_10]`
- E. `[Emily, Percy, Gordon, Diesel_10, Thomas]`

```
System.out.println(names);           //1

for(int i = 0; i < names.size(); i++){
    int temp = names.get(i).length() % 5;
    names.add(temp, names.remove(i));
}

ListIterator<*1> it = names.listIterator();

if(it.next().equals( "It" ))
    System.out.print( "Found" );
```

QUESTION 28

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

- A. Thomas
- B. Emily
- C. Percy
- D. Gordon
- E. Diesel_10

```
it.next();
it.next();
it.next();
System.out.print(it.next());        //2
```

QUESTION 29

What is output by the code to the right?

- A.Sche..atsky
- B. .Scherbatsky
- C. R.Sche.atsky
- D. RobinScherbatsky
- E. There is no output due to a runtime error.

```
String str = "RobinScherbatsky";
str.replaceAll("[robin]","", ".");
System.out.println(str);
```

QUESTION 30

After executing the Client Code, what is the value of start.r.r.r.r.r.r.r.r.r.l.v?

- A. 0
- B. 9
- C. num
- D. 8
- E. There is no output due to a Null Pointer Exception.

```
public class Link{
    public Link l;
    public Link r;
    public String v;

    public Link(String v){
        this.v = v;
    }
}
```

QUESTION 31

After executing the Client Code, what is the value of start.l.l.l.l.l.l.l.l.l.r.l.l.v?

- A. 92
- B. 93
- C. 0
- D. 94
- E. There is no output due to a Null Pointer Exception.

```
////////////////////////////////////
//client code
int num = 0;
Link start = new Link(""+num);
while(num++<=100){
    start.r = new Link(""+num);
    start.r.l = start;
    start = start.r;
}
```

QUESTION 32

What is output by the code to the right?

- A. BpkSp
- B. Ap1Us
- C. sUlpA
- D. aPLuS
- E. There is no output due to a runtime error.

```
String x = "Ap1Us";
String y = "";
for(int i=0; i<x.length(); i++)
    y+=(char) (x.charAt(i)-(i-1));
out.println(y);
```

QUESTION 33

What is output by the code to the right?

- A. 111111
- B. OMG 11.11.11.
- C. 11.11.11.
- D. 10.10.10.
- E. There is no output due to a runtime error.

```
String n = "OMG Skyrim!";
for (int az = 0; az < 3; az++)
{
    out.print(az + n.length() + ".");
    n = n.substring(0,n.length()-1);
}
```

QUESTION 34

What is output by the code to the right?

- A. TwoFour
- B. OneFour
- C. TwoThreeFour
- D. TwoThree
- E. ThreeFour

```
try{
    int t1 = 10;
    int t2 = 5;
    int t3 = 20 / t1 % t2;
    System.out.print("One");
}
catch(ArithmeticException e){
    System.out.print("Two");
}
catch(Exception e){
    System.out.print("Three");
}
finally{
    System.out.print("Four");
}
```

QUESTION 35

Which of the following could replace **<*1>** in the code to the right so that method `empty` will determine if `tm` references an instantiated object?

- A. `tm == null`
- B. `tm.equals("")`
- C. `tm == ""`
- D. `tm instanceof null`
- E. `tm.exists()`

```
public class Node{
    public Node pt;
    public String data;
}
```

Assume Question 35 was filled correctly.

```
public class Structure{
```

QUESTION 36

What is output by the following code?

```
Structure s1 = new Structure();
Structure s2 = new Structure();
String term = "uilrocks";

for(int i = 0; i < term.length(); i++){
    if(i % 4 == 1)
        s2.add(s1.look());
    if(i % 3 == 1)
        s2.add(s1.get());
    s1.add(term.substring(i,i+1));
}

while(!s2.empty()){
    System.out.print(s2.get());
}
```

- A. uilrocks B. kiroo
- C. koruu D. korui
- E. There is no output due to a runtime error.

```
private Node tm;

public void add(String s){
    Node rs = new Node();
    rs.data = s;
    rs.pt = tm;
    tm = rs;
}

public String look(){
    return tm.data;
}

public String get(){
    String yu = tm.data;
    tm = tm.pt;
    return yu;
}

public boolean empty(){
    return <*1>;
}
}
```

QUESTION 37

What type of data structure does the `Structure` class implement?

- A. A queue. B. A stack.
- C. A linked list. D. A priority queue.
- E. A max heap.

QUESTION 38

What is output by the code to the right?

- A. $-.3$
B. $-.2$
C. $-.1$
D. $.2$
E. $.3$

```
double xa = -9.3;
double ya = xa % 3;
System.out.println( ya );
```

QUESTION 39

What is output by the code to the right?

- A. -5
B. -25
C. 0
D. 5
E. There is no output due to a syntax error.

```
int xw=5,yz=xw-10,zz=yz*xw;  
System.out.println(xw+yz+zz);
```

QUESTION 40

What is output by the code to the right?

- A. 0
- B. 0s0
- C. 000ast0d
- D. banananastand
- E. There is no output due to a runtime error.

```
String st = "banananastand";
st = st.replaceAll("[a-d]+[^s]", "0");
System.out.println(st);
```