

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  $75_8$  plus  $50_8$  ?

- A.  $48_{10}$                       B.  $110001_2$                       C.  $1100101_2$                       D.  $101110_2$                       E.  $12111_4$

**QUESTION 2**

What is output by the code to the right?

- A. 15              B. 7              C. 11              D. 10              E. 32

```
int a = 2 * 6 + 10 / 3;
System.out.println(a);
```

**QUESTION 3**

What is output by the code to the right?

- A. 5              B. 7              C. 4              D. 6              E. 0

```
int b = 5, c = 1;
c = b++ + ++c;
System.out.println(c);
```

**QUESTION 4**

What is output by the code to the right?

- A. 0m                      B. 0i  
C. 155                      D. 157  
E. There is no output due to a syntax error.

```
String d = "0valentinesday";
out.print(d.charAt(0)+ d.charAt(8));
```

**QUESTION 5**

What is output by the code to the right?

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

```
int[] array = {2, 4, 3, 1, 0};
for( int it : array )
    array[it] = array[it] + 1;
System.out.println(array[3]);
```

**QUESTION 6**

What is output by the code to the right?

- A. 1              B. 2              C. 0              D. -3  
E. There is no output due to a runtime error.

```
int e = 3;
double f = 1.5;
e -= f + f + e;
System.out.print( (int)e );
```

**QUESTION 7**

What is output by the code to the right?

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

```
boolean g = true;
boolean i = false;
boolean h = g && (!i || !g ^ g & i);
System.out.println(h);
```

**QUESTION 8**

What is output by the code to the right?

- A. 0  
B. 1  
C. 02  
D. 01  
E. There is no output due to a syntax error.

```
Double dude = Math.round(4.5);
if ( dude < 5 )
    System.out.print(0);
if ( dude > 5)
    System.out.print(1);
System.out.print(2);
```

**QUESTION 9**

Which of the following could replace **<\*1>** in the client code at right?

- A. `new Storage();`
- B. `new Storage("litte", 7.5);`
- C. `new Bucket("litte", 7.5);`
- D. A and B only
- E. A, B, and C

```
public interface Storage
{
    public double capacity();
}

public class Bucket implements Storage
{
    private String name;
    private double volume;

    public Bucket(String n, double v)
    {
        name = n;
        volume = v;
    }

    public double capacity()
    {
        //implementation not shown
    }
}
```

**QUESTION 10**

Assuming that **<\*1>** is filled correctly, which of the following could fill blank **<\*2>** in the client code at right?

- A. `System.out.println(t.name);`
- B. `System.out.println(t.capacity);`
- C. `System.out.println(t.capacity());`
- D. A and B only
- E. A, B, and C

```
////////////////////////////////////
//client code
Storage t = <*1>
<*2>
```

**QUESTION 11**

What is output by the code to the right?

- A. `[3.4, 22]`
- B. `[22, 3.4]`
- C. `[3.4, 4.5, 22, 88]`
- D. `[]`
- E. There is no output due to a runtime error.

```
Collection stuff = new TreeSet();
stuff.add(4.5);
stuff.add(88);
stuff.add(3.4f);
stuff.remove(4.5);
stuff.add(22);
stuff.remove(88);
System.out.println(stuff);
```

**QUESTION 12**

What is output by the code to the right?

- A. 0
- B. 1
- C. true
- D. false
- E. `Boolean.TRUE`

```
Boolean bb;
int cmp;
cmp = Boolean.FALSE.compareTo(Boolean.TRUE);
bb = cmp > 0 ? true : false;
System.out.println( bb );
```

**QUESTION 13**

What is output by the client code to the right?

- A. `btg`
- B. `\\b\\t\\g`
- C. `\\b\\t\\g`
- D. `\\g`
- E. There is no output due to a runtime error.

```
System.out.println("\\b\\t\\g");
```

**QUESTION 14**

What is the purpose of method `doIt`?

- A. The method returns a list containing the reversed values of `c`.
- B. The method returns a list containing the sorted values of `c`.
- C. The method returns a list containing the odd values of `c`.
- D. The method returns a list containing the even values of `c`.
- E. The method returns a list containing the values of `c` in the original order sent in.

```
public static List doIt(Collection c)
{
    Queue q = new PriorityQueue(c);
    List ret = new ArrayList();
    while(!q.isEmpty())
        ret.add(q.remove());
    return ret;
}
```

**QUESTION 15**

What is output by the code to the right?

- A. u i l c s
- B. uilcs
- C. scliu
- D. us
- E. There is no output due to a syntax error.

```
char[] uilRay = {'u','i','l','c','s'};
String uilString;
uilString = new String(uilRay);
System.out.println(uilString);
```

**QUESTION 16**

What is output by the code to the right?

- A. 5
- B. 4
- C. 4.34
- D. 4.3
- E. There is no output due to a syntax error.

```
Number nb = new Number("4.34");
out.println(nb.intValue());
```

**QUESTION 17**

What is output by the code to the right?

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

```
int trap = 50;
do
{
    for(int i=0; i<20; i=i+3)
        trap = trap - 2;
}while(trap > 0);
System.out.println(trap);
```

**QUESTION 18**

Which of the following could be used in a `switch` statement?

- A. boolean
- B. String
- C. byte
- D. double
- E. Long

**QUESTION 19**

What is the output by the code to the right?

- A. -130-131-132
- B. -130-131-1320
- C. -135-161-137-138
- D. -135-161-137
- E. 0

```
int noom = Byte.MIN_VALUE+1;
int[][] mat = new int[4][4];
for(int r = 0; r < mat.length; r++){
    for(int c = 0; c <=r; c++){
        mat[r][c] = noom;
        noom--;
    }
}

for(int c = 0; c < mat.length; c++){
    System.out.print(mat[2][c]);
}
```

**QUESTION 20**

What is the output by the code to the right?

- A. 3232511
- B. 4degrfea
- C. 1de
- D. 823de25gr
- E. 0

```
String b4 = "23de25gr11fea";
String[] chunks = b4.split("\\d+");
System.out.print(chunks.length);
for(String s: chunks)
    System.out.print(s);
```

**QUESTION 21**

Which of the following could replace **<\*1>** in the client code at right so that method sort would terminate properly?

- A. m != k
- B. m == k
- C. m > k
- D. m < k
- E. m.equals(k)

**QUESTION 22**

What is the output by the code to the right?

- A. 568452137
- B. 576384521
- C. 561374528
- D. 568137452
- E. 137568452

```
public class Guess
{
    public static void s(int[] list, int k)
    {
        int m = 0;
        for(int i = 1; i < list.length; i++)
        {
            m++;
            if( <*1> )
                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 s?

- A. Merge sort
- B. Quick sort
- C. Bubble sort
- D. Insertion sort
- E. Selection sort

**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 s? Choose the most restrictive correct answer.

- A. O(NlogN)
- B. O(N)
- C. O(N<sup>3</sup>)
- D. O(1)
- E. O(N<sup>2</sup>)

```
////////////////////////////////////
//client code
int[] list = {8,5,6,4,5,2,1,3,7};
Guess.s(list,3);
for(int t: list)
    System.out.print( t );
```

**QUESTION 25**

What is the output by the code to the right?

- A. 0
- B. 12
- C. 2
- D. 6
- E. 25

```
int count = 0;
for(int i = 0; i < 5; i++){
    for(int j = 4; j >= 0; j--){
        if(i > j)
            break;
        if( (i + j) % 2 == 0)
            continue;
        count++;
    }
}
System.out.print(count);
```

**QUESTION 26**

Which of the following can replace **<\*1>** in the code to the right so that all instances of Player share the same teamPoints variable, but only instances of Player can access it?

- A. private static
- B. private
- C. protected static
- D. protected
- E. protected private static

```
public class Player{

    <*1> int teamPoints;
    private String name;
    private int number;
    private int effect;

    public Player(String na, int num){
        name = na;
        number = num;
    }

    public void goal(int s){
        teamPoints += s;
        effect += s;
    }

    public void assist(){
        effect++;
    }

    public static int teamScore(){
        return teamPoints;
    }

    public String toString(){
        return "#" + number + " " + name
            + " has an effect of " + effect;
    }
}
```

**QUESTION 27**

What is the output by the line marked //line 1?

- A. 10
- B. 8
- C. 5
- D. 12
- E. 4

**QUESTION 28**

What is the output by the line marked //line 2?

- A. #6 TJ Bosh has an effect of 4
- B. #5 TJ Bosh has an effect of 4
- C. #4 TJ Bosh has an effect of 3
- D. #4 TJ Bosh has an effect of 5
- E. #4 TJ Bosh has an effect of 6

```
////////////////////////////////////
//in client code
Player p1 = new Player("TJ Bosh", 4);
Player p2 = new Player("Chris Ford", 6);

p1.goal(2);
p1.assist();
p1.goal(3);
p2.assist();
p2.goal(3);

out.println(Player.teamScore()); //line 1
out.println(p1); //line 2
```

**QUESTION 29**

Which of the following constructors could be placed in class You?

- A. `public You( Integer[] ints) { }`
- B. `public You( []int [][]ints) { }`
- C. `public You( Double double ) { }`
- D. `public You( Object ints) { }`
- E. more than one of these

**QUESTION 30**

What is the output by the the call `new You(9.1)?`

- A. one
- B. two
- C. three
- D. there is no output due to a syntax error
- E. more than one of these

**QUESTION 31**

What is the output by the the call  
`new You("a b c".split(" "))?`

- A. one
- B. two
- C. three
- D. there is no output due to a syntax error
- E. more than one of these

**QUESTION 32**

What is returned by the method call `fancy(7)?`

- A. 17
- B. 14
- C. -7
- D. 1
- E. 9

**QUESTION 33**

What is output by the code to the right?

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

```
public class You
{
    public You( Object obj ){
        System.out.println("one");
    }

    public You( Double dbl ){
        System.out.println("two");
    }

    public You( String[] words ){
        System.out.println("three");
    }
}
```

```
public static int fancy(int x)
{
    if( x == 0 ) return 1;
    if( x % 2 == 0 )
        return fancy( x - 1 ) + x;
    else
        return fancy( x - 1 ) - 1;
}
```

```
String bird = "chicken";
String house = "cheap";
out.println(bird.compareTo(house));
```

**QUESTION 34**

What is output by the code to the right?

- A. One
- B. OneTwo
- C. OneThree
- D. TwoThree
- E. There is no output due to a syntax error.

```
try{
    System.out.print("One");
}
catch(Exception e){
    System.out.print("Two");
}
finally{
    System.out.print("Three");
}
```

**QUESTION 35**

Which of the following could replace **<\*1>** in the code to the right so that method remove will return a value and move up to the next value?

- A. front = front.data;
- B. front.pt = front;
- C. front = front + 1;
- D. front = front.pt;
- E. front = front - 1;

```
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 = "whatisthis";

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

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

- A. thisiswhat                      B. sihtsitahw
- C. wtshs                          D. ititww
- E. There is no output due to a runtime error.

```
private Node front;

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

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

public String remove(){
    String obj = front.data;
    <*1>
    return obj;
}

public boolean empty(){
    return front == null;
}
}
```

**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**

If  $N$  equals `oList.length`, what is the Big O of method `why` when `c` is an `ArrayList` and when `c` is a `TreeSet`?  
Pick the most restrictive set of correct answers.

- | ArrayList        | TreeSet               |
|------------------|-----------------------|
| A. $O(1)$        | $O(N \cdot \log_2 N)$ |
| B. $O(N)$        | $O(N \cdot \log_2 N)$ |
| C. $O(N^2)$      | $O(N \cdot \log_2 N)$ |
| D. $O(\log_2 N)$ | $O(N)$                |
| E. $O(N)$        | $O(\log_2 N)$         |

```
public static void why(
    Collection<String> c, Object[] oList)
{
    for(Object obj : oList)
    {
        c.add(obj);
    }
}
```

**QUESTION 39**

What is output by the code to the right?

- A. oops  
 B. huh  
 C. oopshuh  
 D. huhoops  
 E. There is no output due to a syntax error in the code.

```
try{
    int x = 5 / 9 % 3 ;
}
catch( Exception e){
    System.out.print("oops");
}
finally{
    System.out.print("huh");
}
```

**QUESTION 40**

What is output by the code to the right?

- A. 0  
 B. 1  
 C. 2  
 D. 3  
 E. 4

```
System.out.println( 10 >>> -2 );
```