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 26_8 times 42_8 ?

A. 738_{10} B. 11011001_2 C. 1011101100_2 D. 101000110_2 E. 23229_4

QUESTION 2

What is output by the code to the right?

A. 24 B. 20 C. 27 D. 22 E. 32

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

QUESTION 3

What is output by the code to the right?

A. 12 B. 10 C. 16 D. 8 E. 14

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

QUESTION 4

What is output by the code to the right?

A. cd B. 199

C. ua D. 201

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

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

QUESTION 5

What is output by the code to the right?

A. 12 B. 10

C. 18 D. 6

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

```
int[] hrts = {2,5,9,11,17,21};
for( int val : hrts )
  hrts[val] = hrts[val] + 1;
System.out.println(hrts[3]);
```

QUESTION 6

What is output by the code to the right?

A. 3 B. 4.5 C. 5 D. -1

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

```
int e = 3;
double f = 1.5;
e -= f * 3;
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 = false;
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. 2

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

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

QUESTION 9

What is the minimum number of methods that class Heart could contain in order to compile without error?

A. 0

B. 1

C. 2

D. 3

E. more than 3

QUESTION 10

Which of the following could fill blank **<*1>** in the client code at right?

A. `System.out.println(t.getArea());`

B. `System.out.println(t.getVolume());`

C. `System.out.println(t.area);`

D. A and B only

E. A, B, and C

```
public interface Shape {
   public double getArea();
   public double getVolume();
}

public class Heart implements Shape {
   private double area;
   private double volume;

   public Heart(double a, double v) {
      area = a;
      volume = v;
   }

   //other method implementations not shown
   //assume all necessary methods are present
}

//////////////////////////////////////////
//client code
Shape t = new Heart(10, 345);
<*1>
```

QUESTION 11

What is output by the code to the right?

A. `[99, 3.14, 50.0]`

B. `[3.14, 50.0, 99]`

C. `[3.14, 50.0, 99.0]`

D. `[3, 50, 99]`

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

```
Collection stuff = new TreeSet();
stuff.add(99);
stuff.add(50f);
stuff.add(3.14);
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;
Boolean a = Boolean.TRUE;
Boolean b = Boolean.FALSE;
int cmp = a.compareTo(b);
bb = cmp > 0 ? true : false;
System.out.println( bb );
```

QUESTION 13

Evaluate the code to the right and choose the answer that best describes the result of running this code.

A. A `g` is printed at the beginning of the current line.

B. A `g` is printed at the end of the prior line.

C. A `t`, two `b`s, and a `g` are printed at the front of the current line.

D. There is no output due to an error.

E. There is no output.

```
System.out.println("\t\b\b\\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 that all of the original values of c as well a second copy of each of the values of c..

```
public static List doIt(Collection c)
{
   HashSet hs = new HashSet(c);
   TreeSet ts = new TreeSet(hs);
   ArrayList a = new ArrayList();
   a.addAll(hs);
   a.addAll(ts);
   return a;
}
```

QUESTION 15

What is output by the code to the right?

A. `h o o p s`
B. `hoops`
C. `spooh`
D. `ut`
E. There is no output due to a syntax error.

```
char[] uilRay = {'h','o','o','p','s'};
String uilString;
uilString = new String(uilRay);
System.out.println(uilString);
```

QUESTION 16

What is output by the code to the right?

A. `5.0`
B. `6.0`
C. `5.72`
D. `5.7`
E. There is no output due to a syntax error.

```
Number nb = new Number("5.72");
out.println(nb.doubleValue());
```

QUESTION 17

What is output by the code to the right?

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

```
int trap = 101;
do
{
  for(int i=0; i<13; i=i+5)
    trap = trap – 9;
}while(trap > 0);
System.out.println(trap);
```

QUESTION 18

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

A. `short` B. `String` C. `float` D. `double` E. `Long`

QUESTION 19

What is the output by the code to the right?

A. `-130-131-13200`
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[5][5];
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[3][c]);
}
```

QUESTION 20

What is the output by the code to the right?

A. 3
B. 4
C. 1
D. 5
E. 0

```
String b4 = "10the13new26xfiles00fringe";
String[] chunks = b4.split("\\d+");
System.out.print(chunks.length);
```

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.equals(k)`
C. `m > k`
D. `m < k`
E. `m == k`

QUESTION 22

What is the output by the code to the right?

A. 13417762001
B. 11346772001
C. 01123467701
D. 00111234677
E. 14377126001

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. $O(N^3)$
D. O(1)
E. $O(N^2)$

```
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;
    }
  }
}


//////////////////////////////////////////
//client code
int[] list = {3,1,4,1,7,7,6,2,0,0,1};
Guess.s(list,9);
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. `4`

```
int count = 0;
for(int i = 2; i < 7; i++){
  for(int j = 5; j >= 1; 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 `Gamer` share the same `teamPoints` variable, but only instances of `Gamer` can access it?

A. `private static`

B. `private`

C. `protected static`

D. `protected`

E. `protected private static`

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 Super Sammy has a help of 4`

B. `#5 Super Sammy has a help of 6`

C. `#4 Super Sammy has a help of 3`

D. `#7 Super Sammy has a help of 5`

E. `#7 Super Sammy has a help of 6`

```
public class Gamer{

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

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

  public void kill(int s){
     teamPoints += s;
     help += s;
  }

  public void helper(){
     help++;
  }

  public static int teamScore(){
     return teamPoints;
  }

  public String toString(){
     return "#" + number + " " + name
        + " has a help of " + help;
  }
}

////////////////////////////////////
//in client code
Gamer p1 = new Gamer("Super Sammy", 7);
Gamer p2 = new Gamer("Big Benny", 2);
p1.kill(2);
p1.helper();
p1.kill(3);
p2.helper();
p2.kill(3);
out.println(Gamer.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 number) {  }`
C. `public You( Boolean b) { }`
D. `public You( Stack<Integer> st) {  }`
E. more than one of these

QUESTION 30

What is the output by the the call `new You(712)`?

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("fo od wow".split(" "))`?

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

```
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");
   }
}
```

QUESTION 32

What is returned by the method call `roses(11)`?

A. `-5`
B. `3`
C. `-7`
D. `1`
E. `4`

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

QUESTION 33

What is output by the code to the right?

A. `0237Aab`
B. `a03Ab27`
C. `72bA30a`
D. `Aab0237`
E. The code would output the memory address for trash.

```
char[] trash = "a03Ab27".toCharArray();
Arrays.sort(trash);
System.out.println(trash);
```

QUESTION 34

What is output by the code to the right?

A. `hit`

B. `hitball`

C. `hitthe`

D. `ball`

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

```
try{
   System.out.print("hit");
}
catch(Exception e){
   System.out.print("the");
}
finally{
   System.out.print("ball");
}
```

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 = getFront().data;`

B. `front.pt = getFront();`

C. `front = getFront() + 1;`

D. `front = getFront().pt;`

E. `front = getFront() - 1;`

Assume Question 35 was filled correctly.

QUESTION 36

What is output by the following code?

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

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. `dgwhowq` B. `dogbadwho`

C. `ohwdabgod` D. `dgbadww`

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

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.

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

public class Structure{

  private Node front;

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

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

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

  public boolean empty(){
     return getFront() == null;
  }

  public Node getFront(){
     return front;
  }
}
```

QUESTION 38

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

	LinkedList	HashSet
A.	O(1)	$O(N*Log_2N)$
B.	O(N)	O(N)
C.	O(1)	O(N)
D.	$O(Log_2N)$	O(N)
E.	O(1)	O(1)

```
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 = 10 / ( 1 / 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( -32 >>> -1 );
```