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 19_{12} plus 15_{13} ?

A. 46_8 B. 123_5 C. 49_{10} D. 54_7 E. 43_{10}

QUESTION 2

What is output by the code to the right?

A. 12 B. 10 C. 14 D. 24

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

```
int a = 10 + 4 % 9 / 2;
System.out.println(a);
```

QUESTION 3

What is output by the code to the right?

A. 1.67 B. 1 C. 0 D. 1.00

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

```
double b = (double)(5 / 3);
System.out.printf("%.2f",b);
```

QUESTION 4

What is output by the code to the right?

A. 8 B. 4

C. 7 D. 6

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

```
int cn = 0;
for(int c = 30; c>10; c=c-3)
{
   cn=cn+1;
}
System.out.print(cn);
```

QUESTION 5

What is output by the code to the right?

A. \2\3\4 B. \\2\\4

C. \\2\\3 D. 234

E. \\4

```
String d = "\\2\\3\\4";
System.out.print(d);
```

QUESTION 6

What is output by the code to the right?

A. 10 B. 5 C. 4 D. 7 E. 1

```
long[] ray = {2,4,9,0,1,7,5,3};
ray[1] = ray[ray.length-2];
ray[ray.length-2] = ray[1];
out.println(ray[ray.length-2]);
```

QUESTION 7

What is output by the code to the right?

A. yes B. no

C. false D. true

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

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

QUESTION 8

What is output by the code to the right?

A. rtuv

B. uv

C. rtv

D. rv

E. ruv

```
int theNum = 2;

if(theNum > 1)
  System.out.print("r");
  if(theNum < 1)
    System.out.print("t");
  else
    System.out.print("u");
System.out.print("v");
```

QUESTION 9

Which of the following could replace **<*1>** in the code to the right so that method `isSame` would correctly compare two different `Thing` objects?

A. `color.equals(b.color)`

B. `color.equals(color)`

C. `b.getColor().equals(getColor())`

D. `color.equals(b.getColor())`

E. more than one of these

QUESTION 10

Assuming that **<*1>** is filled correctly, what is output by the line marked `//1` in the client code to the right?

A. `true`

B. `false`

C. `no`

D. `yes`

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

```
public class Thing
{
   private Color color;

   public Thing(Color c)
   {
      color = c;
   }

   public boolean isSame(Thing b)
   {
      if( <*1> )
        return true;
      return false;
   }
}

////////////////////////////////////////
//client code

Thing tOne = new Thing(Color.BLUE);
Thing tTwo = new Thing(Color.YELLOW);

out.println(tOne.isSame(tTwo));   //1
```

QUESTION 11

What is output by the code to the right?

A. `>==`

B. `<`

C. `==`

D. `><`

E. `<==`

```
Character ch1 = new Character('B');
Character ch2 = new Character('b');

if(ch1.hashCode() > ch2.hashCode())
   System.out.print(">");
else
   System.out.print("<");

System.out.print("==");
```

QUESTION 12

What is output by the code to the right?

A. `52`

B. `50`

C. `2`

D. `4`

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

```
System.out.printf("%c",96/2+4);
```

QUESTION 13

What is returned by method `getIt`?

A. the top left element from the matrix

B. the bottom right element from the matrix

C. the bottom left element from the matrix

D. the top right element from the matrix

E. There is no output due to an `IndexOutOfBoundsException`.

```
public static int getIt(int[][] iMat)
{
  int top = iMat.length-1;
  top = iMat[top][top-top];
  return top;
}
```

QUESTION 14

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

A. `0`
B. `1`
C. `9`
D. `3`
E. `12`

```
public static int doIt(int times)
{
  int val = 0;
  for(int i=1; i<times; i++)
    for(int j=1; j<times; j++)
      val = val + i * j;
  return val;
}

////////////////////////////////////////
//client code
out.println(doIt(3));   //1
```

QUESTION 15

What is output by the code to the right?

A. `itall` B. `win` C. `it` D. `all` E. `tall`

```
String j = "getitall";
out.print(j.substring(3));
```

QUESTION 16

What is output by the code to the right?

A. `6`
B. `4`
C. `0`
D. `3`
E. `8`

```
int pug = 10/3;
switch( pug ){
  case 2 : pug = 4; break;
  case 3 : pug = 6;
  case 4 : pug = 8; break;
  case 5 : pug = 0;
}
System.out.println( pug );
```

QUESTION 17

What is output by the code to the right?

A. `7` B. `10` C. `5` D. `11` E. `6`

```
int trap = 0, z=3;
do
{
  z=z+4;
  trap++;
}while(z<20 && trap<20);
System.out.println(trap);
```

QUESTION 18

What is output by the code to the right?

A. `false` B. `true` C. `stop` D. `0` E. `1`

```
boolean k=false, m=true, p=false;
System.out.println(k && (m || p));
```

QUESTION 19

What is output by the code to the right?

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

```
ArrayList<Integer> bunch;
bunch = new ArrayList<Integer>();
bunch.add(7);
bunch.add(1);
bunch.remove(0);
bunch.add(8);
bunch.set(0,3);
bunch.remove(0);
bunch.add(0,2);
System.out.println(bunch);
```

QUESTION 20

What is output by the code to the right?

A. `3` B. `3.0` C. `4` D. `5` E. `4.0`

```
double dbl = (int)Math.sqrt(4)+1;
System.out.print(dbl);
```

QUESTION 21

What is output by the code to the right?

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

```
System.out.println(9 ^ 8 & 11);
```

QUESTION 22

What is returned by the method call `what(new int[]{9,11,2,5,-8,0,3})` ?

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

QUESTION 23

What is returned by the method call `what(new int[]{0,7,6,10,-1,2,11})` ?

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

```
public static int what(int[] x)
{
  int tally=0;
  for(int it : x)
  {
    if( it>7 )
      tally = tally - 1;
    else if( it<5 )
      tally = tally + 1;
  }
  return tally;
}
```

QUESTION 24

What is output by the code to the right?

A. whoot B. null

C. other D. orig

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

```
String orig = "whoot";
String other = orig;
orig = null;
System.out.println(other);
```

QUESTION 25

What is returned by the method call `wow(5)` ?

A. 35 B. 22 C. 30 D. 16 E. 29

QUESTION 26

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

A. 16 B. 22 C. 30 D. 35 E. 29

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

QUESTION 27

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

A. ape

B. big

C. cat

D. false

E. true

QUESTION 28

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

A. ape

B. dog

C. cat

D. pig

E. big

```
Stack<String> s = new Stack<String>();
s.push("ape");
s.push("dog");
s.push("cat");
s.push("pig");
System.out.println(s.push("big"));    //1

s.pop();
s.pop();
System.out.println(s.pop());          //2
```

QUESTION 29

Method `yo` is which standard sorting algorithm?

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

QUESTION 30

Which of the following should replace **`<*1>`** in the code to the right so that all items will be sorted after a call to public `yo()`?

A. `low < high`
B. `high > low`
C. `low < high-1`
D. A and B only
E. A, B, and C

QUESTION 31

Assuming that **`<*1>`** is filled correctly, what is output by the line marked `//1` in the client code to the right?

A. 1
B. 6
C. 8
D. 2
E. 5

QUESTION 32

Assuming that **`<*1>`** is filled correctly, what is output by the line marked `//2` in the client code to the right?

A. 1
B. 6
C. 8
D. 2
E. 5

```
public class Pain
{
  public static void yo(Comparable[] list)
  {
     int end = list.length-1;
     yo(list, 0, end);
  }


  private static void yo(Comparable[] list,
                         int low, int high)
  {
     if( <*1> )
     {
        int p = how(list, low, high);
        yo(list, low, p);
        yo(list, p+1, high);
     }
  }


  public static int how(Comparable[] list,
                         int low, int high)
  {
     Comparable p = list[low];
     int b = low-1;
     int t = high+1;
     boolean run = true;
     while(run)
     {
        do{
           --t;
        }while(list[t].compareTo(p) > 0);

        do{
           b++;
        }while(list[b].compareTo(p) < 0);

        if (b >= t){
           run = false;
        }
        else{
           Comparable temp = list[b];
           list[b] = list[t];
           list[t] = temp;
        }
     }
     return t;
  }
}

////////////////////////////////////////
//client code

Integer[] br = {8,9,3,2,1,6,5,7,0,4};


Pain.how(br, 3, 7);
out.println(br[br.length/2]);    //1


Pain.yo(br);
out.println(br[br.length/2]);    //2
```

QUESTION 33

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

A. `e`

B. `o`

C. `r`

D. `l`

E. `s`

QUESTION 34

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

A. `2`

B. `3`

C. `7`

D. `5`

E. `8`

```
String x = "GeorgleBoolIsCool";

String[] group = x.split("\\p{Upper}");

out.println(group[3]);                //1
out.println(group.length);            //2
```

QUESTION 35

How many instance variables are there in class `First`?

A. `0` B. `2` C. `1` D. `3` E. `9`

QUESTION 36

Which of the following could replace **`<*1>`** in the client code to the right so that instance variable `name` would be assigned the value of parameter `name`?

A. `name = name;`

B. `this.name = name;`

C. `name = this.name;`

D. `super.name = name;`

E. more than one of these

QUESTION 37

Which of the following could replace **`<*2>`** in the client code to the right so that the parent constructor would be called?

A. `First(name);`

B. `super(name);`

C. `this(name);`

D. `super(name, size);`

E. more than one of these

```
public class First
{
  private String name;

  public First(String name)
  {
    <*1>
  }

  public String toString()
  {
    return name;
  }
}


public class Last extends First
{
  private int size;

  public Last(String name, int s)
  {
    <*2>
    size = s;
  }
}
```

QUESTION 38

Which of the following are legal method calls to `nineBall`, an instance of `PBilliards` from client code in a separate file?

I. `nineBall.hashCode();`

II. `nineBall.getBalls();`

III.
```
nineBall.compareTo(new
        PBilliards("eightBall", 15,2));
```

A. I only

B. II only

C. I and II only

D. II and III only

E. I, II, and III

QUESTION 39

What is output by the following code?

```
PBilliards g1;
g1 = new PBilliards("Straight Pool", 15, 2);

System.out.print(g1.toString() +
                         g1.hasPockets());
```

A. `PBilliards has 15 balls.false`

B. `Straight Pool has 2 balls.false`

C. `Straight Pool has 15 balls.false`

D. `Straight Pool has 15 balls.true`

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

QUESTION 40

Which of the following will not cause a syntax error?

A. `CueSport s1 = new CueSport();`

B.
```
CueSport s2 = new
      CueSport("Snookers", 21);
```

C.
```
PBilliards s3 = new
      CueSport("Nine Ball", 9)
```

D.
```
PBilliards s4 = new
      PBilliards();
```

E.
```
CueSport s5 = new
      PBilliards("Eight Ball", 15, 2);
```

```
public abstract class CueSport{

   protected int balls;
   protected String name;

   public int getBalls(){
      return balls;
   }

   public String getName(){
      return name;
   }

   public abstract boolean hasPockets();

   public String toString(){
      return name + " has "
                  + balls + " balls.";
   }
}


public class PBilliards extends CueSport{

   private int players;

   public PBilliards(String n, int b){
      this(n, b, 2);
   }

   public PBilliards(String n, int b, int p){
      name = n;
      balls = b;
      players = p;
   }

   public boolean hasPockets(){
      return true;
   }
}
```