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 17_9 plus 10_4 ?

A. 120_4 B. 41_5 C. 13_8 D. 22_{10} E. 32_6

QUESTION 2

What is output by the code to the right?

A. 4 B. 14 C. 4.0 D. 14.0

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

```
double a = Math.min(34,44);
a = a - 10 * 3;
System.out.println(a);
```

QUESTION 3

What is output by the code to the right?

A. 95 B. 105 C. 90 D. 115

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

```
int b = 30;
b += b + 15 + b + 10;
System.out.println(b);
```

QUESTION 4

What is output by the code to the right?

A. 12 B. 8 C. 139 D. 026 E. 02612

```
for(int c=0; c<10; c=c*2)
   System.out.print(c++);
```

QUESTION 5

What is output by the code to the right?

A. electric B. lctric

C. xxxxxxxx D. xlxctric

E. d

```
String d = "electric";
d.replaceAll("e","x");
System.out.print(d);
```

QUESTION 6

What is output by the code to the right?

A. 10 B. 7

C. 6 D. 14

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

```
short[] ray = {1,5,6,3,2,4,8};
ray[0] = ray[2]+ray[5];
System.out.println(ray[0]);
```

QUESTION 7

What is output by the code to the right?

A. yes B. no

C. maybe D. true

E. false

```
boolean a = false;
boolean b = true;
boolean c = false;
b = !a && b || c;
c = b || (c && (!a || b));
System.out.println(c);
```

QUESTION 8

What is output by the code to the right?

A. 0

B. 1

C. 2

D. 012

E. 12

```
int theNum = 20/3;
if(theNum > 7)
  System.out.print(0);
else
if(theNum < 7)
  System.out.print(1);
  System.out.print(2);
```

QUESTION 9

Which of the following could replace **<*1>** in the code of class `Scratch` to the right so that method `kickItUp` would change `fun` to `fun` to the power of `p`?

A. `fun = fun ^ p;`

B. `fun = fun * p;`

C. `fun = Math.power(fun, p);`

D. `fun = Math.pow(fun, p);`

E. more than one of these

QUESTION 10

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

A. `75.0`

B. `125.0`

C. `100.0`

D. `150.0`

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

```
public class Scratch
{
  private double fun;

  public Scratch(double f){
    fun = f;
  }

  public void kickItUp(int p){
    <*1>
  }

  public double getFun(){
    return fun;
  }
}

//////////////////////////////////////////
//client code
Scratch cat = new Scratch(5);
cat.kickItUp(3);
System.out.println(cat.getFun());   //1
```

QUESTION 11

What is output by the code to the right?

A. `10.0` B. `10` C. `9.0` D. `9` E. `9.5`

```
System.out.println(Math.round(9.6));
```

QUESTION 12

What is output by the code to the right?

A. `100` B. `s100`

C. `100s` D. `%s100`

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

```
System.out.printf("%s","100");
```

QUESTION 13

What is output by the code to the right?

A. `t` B. `be` C. `rn` D. `tt` E. `or`

```
String good = "tobeornottobe";
String[] gList = good.split("o");
System.out.println(gList[3]);
```

QUESTION 14

What is output by the code to the right?

A. `11`

B. `-8`

C. `7`

D. `8`

E. `-11`

```
String vals = "apluscompsci";
int total = 0;
char ch;
for(int i=0; i<vals.length(); i++)
{
  ch = vals.charAt(i);
  switch( ch ){
    case 'a' : total++; break;
    case 's' : total--; break;
    case 'p' : total-=2; break;
    case 'c' : total+=2;
    default : total--;
  }
}
System.out.print( total );
```

QUESTION 15

What is output by the code to the right?

A. il B. lo C. ve D. ov E. en

```
String j = "ilovechicken";
System.out.print(j.substring(2,4));
```

QUESTION 16

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

A. 4

B. 5

C. 2

D. 2.5

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

QUESTION 17

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

A. 4

B. 5

C. 2

D. 2.5

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

```
public class Dude{
  private int size;
  public Dude(int s){
    setSize(s);
  }
  public void setSize(int s){
    size = s;
  }
  public int getSize(){
    return size;
  }
}

public class LittleDude extends Dude{
  public LittleDude(int s){
    super(s/2);
  }
}

////////////////////////////////////
// client code
Dude d = new Dude(4);
System.out.println(d.getSize());   //1
d = new LittleDude(5);
System.out.println(d.getSize());   //2
```

QUESTION 18

What is output by the code to the right?

A. 19 B. 23 C. 35 D. 27 E. 100

```
System.out.printf("%o",23);
```

QUESTION 19

What is output by the code to the right?

A. [9, 2, 7, 2, 5, -3]

B. [9, 2, 7, 2, 5, 0]

C. [9, -3, 7, -3, 5, -3]

D. [4, 2, 7, 2, 5, 0]

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

```
Integer[] z = {9,2,7,2,5,0};
List iList = Arrays.asList(z);
ArrayList<Integer> n;
n = new ArrayList<Integer>(iList);

for(int fun : n)
  if(fun>1 && fun<5)
    n.set(n.size()-1,fun-5);
System.out.println(n);
```

QUESTION 20

What is output by the code to the right?

A. 16.0 B. 8.0 C. 32.0 D. -16.0 E. -8.0

```
double dbl;
dbl = Math.pow(Math.abs(-2),4);
System.out.println(dbl);
```

QUESTION 21

What is output by the code to the right?

A. true true

B. false false

C. true false

D. false true

E. true

```
String s = "wearerthechamps";
out.print( s.matches( ".*ec.*" ) );
out.print(" ");
out.print( s.matches( ".*a.+p.*" ) );
```

QUESTION 22

What is the run time for adding a new item to the beginning of an array or ArrayList? Choose the most restrictive correct answer.

A. $O(N^2)$ B. O(1) C. O(N) D. O(NlogN) E. O(logN)

QUESTION 23

Which of the following algorithms has the best run-time if the data is almost sorted?

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

QUESTION 24

What is returned by the method call `gitter(6)` ?

A. `36` B. `18`

C. `72` D. `6`

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

QUESTION 25

What is returned by the method call `gitter(12)`?

A. `12` B. `144`

C. `72` D. `170`

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

QUESTION 26

What is the running time of method `gitter`? Choose the most restrictive correct answer.

A. $O(N^2)$ B. O(1)

C. O(N+N/2) D. O(NlogN)

E. O(logN)

```
public static int gitter(int val)
{
  int amt = 0;
  for(int i = 1; i<=val; i++)
  {
    for(int j = 1; j<=val; j+=2)
    {
      amt = amt + 1;
    }
  }
  return amt;
}
```

QUESTION 27

Which of the following could replace **<*1>** in the code to the right so that the for loop would terminate without error?

A. `intList.size()` B. `intList.length`

C. `intList.length()` D. A and B only

E. A, B, and C

QUESTION 28

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

A. `[2, 6]` B. `[2, 4, 6]`

C. `[0, 2, 4, 6, 8]` D. `[4, 8, 12]`

E. `[0, 2, 4, 6, 8, 10]`

```
LinkedList <Integer> intList;
intList = new LinkedList<Integer>();

for(int i=0, q=0; i<10; i+=2, q++)
   intList.add(q,i);

for(int i=0; i < <*1> ; i++){
   intList.remove(i);
}

out.println(intList);
```

QUESTION 29

What is returned by the method call `wow(9)` ?

A. `4` B. `0`

C. `15` D. `27`

E. `21`

QUESTION 30

What is returned by the method call `wow(20)` ?

A. `4` B. `0`

C. `15` D. `27`

E. `21`

```
public static int wow(int x)
{
  if(x<0)
    return 0;
  else if(x%2==0)
    return x-1 + wow(x-3);
  else
    return x/2;
}
```

QUESTION 31

What is output by the code to the right?

A. `102` B. `110` C. `92` D. `76` E. `132`

```
System.out.println(021 + 0x6 + 87);
```

QUESTION 32

What is output by the code to the right?

A. `[3, null, 5, 4]`

B. `[3, 5, 4]`

C. `[3, 4, 5]`

D. `[3, 4, 5, null]`

E. There is no output due to a null pointer exception.

```
Integer[] data = {3, null, 5, 4};
Set<Integer> hs;
hs = new HashSet<Integer>();

for(Integer i : data)
  hs.add( i );

Set<Integer> ts;
ts = new TreeSet<Integer>(hs);

ts.addAll(hs);
System.out.println(ts);
```

QUESTION 33

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

A. `x` B. `a` C. `j` D. `p` E. `e`

QUESTION 34

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

A. `x` B. `a` C. `j` D. `p` E. `e`

QUESTION 35

What is output by the line marked `//3` in the code to the right?

A. `[x, a, b, e, j, p]`

B. `[x, a, g, b, e, j, p]`

C. `[x, g, b, e, j, p]`

D. `[x, a, e, j, p]`

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

```
ArrayList<String> q;
q = new ArrayList<String>();

q.add("x");
q.add("a");
q.add("b");
q.add("e");
q.add("j");
q.add("p");

ListIterator<String> it;
it = q.listIterator();
out.println(it.next());          //1
out.println(it.next());          //2
it.add("g");
it.remove();
out.println(q);                  //3
```

QUESTION 36

What are the contents of `ray` after the method call `notFun(new int[]{7,2,1,9,8,3})` ?

A. `[1, 2, 3, 7, 8, 9]`

B. `[1, 9, 7, 3, 8, 2]`

C. `[3, 2, 1, 7, 9, 8]`

D. `[1, 3, 2, 9, 8, 7]`

E. `[9, 8, 7, 3, 2, 1]`

QUESTION 37

What standard sorting algorithm is being demonstrated by method `notFun()`?

A. selection sort

B. insertion sort

C. quick sort

D. merge sort

E. heap sort

```
public class Fun
{
  public static void notFun(int[] ray)
  {
    for(int i=0; i< ray.length-1; i++)
    {
     int val = i;
     for(int j = i+1; j< ray.length; j++)
     {
        if(ray[j] < ray[val])
          val = j;
        }
        if( val != i){
          int temp = ray[val];
          ray[val] = ray[i];
          ray[i] = temp;
        }
     }
  }
}
```

QUESTION 38

What is output by the code to the right?

A. `[null, one]`

B. `[null, top]`

C. `[null, one, top]`

D. `[one, top]`

E. There is no output due to a run time exception.

```
Set<String> stringSet;
stringSet = new TreeSet<String>();
stringSet.add("one");
stringSet.add(null);
stringSet.add(new String("top"));
System.out.println(stringSet);
```

QUESTION 39

Assuming that the method `resize()` should increase the number of storage locations in `vals` so that `vals` has `len` number of storage locations, which of the following could replace **`<*1>`** in the code to the right to correctly complete method `resize()`?

A. `vals[i] = temp[i];`

B. `temp[i] = E[i];`

C. `temp[i] = vals[i];`

D. `temp[i] = vals[len];`

E. `temp[len] = vals[i];`

QUESTION 40

What data type is being created by class `Structure`?

A. Queue

B. PriorityQueue

C. Stack

D. Binary Tree

E. Map

```
public class Structure<E>
{
  private E[] vals;
  private int size;


  public Structure(){
    size = 0;
    resize(10);
  }


  public void add(E obj){
    if(size() == top())
    resize(size() + 10 );
    vals[size()] = obj;
    size++;
  }


  public E remove(){
    E ret = vals[--size];
    if(size()-10 == top())
       resize(size() - 10);
    return ret;
  }


  public int size(){
    return size;
  }


  public int top(){
    return vals.length;
  }


  private void resize(int len){
    E[] temp;
    temp = (E[])(new Object[len]);
    for(int i = 0; i < size(); i++)
      <*1>
    vals = temp;
  }
}
```