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 22_4 plus 11_4 ?

A. 51_4 B. 36_5 C. 18_8 D. 44_6 E. 33_4

QUESTION 2

What is output by the code to the right?

A. `0.0` B. `1.0` C. `5.0` D. `3.0`

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

```
double a = '0';
a = a - 45;
System.out.println(a);
```

QUESTION 3

What is output by the code to the right?

A. `50` B. `-25` C. `25` D. `100`

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

```
int b = 50;
b -= b - 25 + b;
System.out.println(b);
```

QUESTION 4

What is output by the code to the right?

A. `41` B. `33` C. `31` D. `40` E. `37`

```
int much = 0;
for(int c=1; c<31; c=c*3)
  much = much + c;
System.out.print(much);
```

QUESTION 5

What is output by the code to the right?

A. `0` B. `11` C. `10` D. `9` E. `-1`

```
String d = "districtUILrocks";
System.out.print(d.indexOf("Lr"));
```

QUESTION 6

What is output by the code to the right?

A. `8` B. `9` C. `11` D. `15` E. `14`

```
long[] ray = {1,5,6,3,2,4,8,9};
System.out.println(ray[1]+ray[7]);
```

QUESTION 7

Which answer is logically equivalent to the following `boolean` expression, where `p` and `q` are `boolean` variables?

```
!p && !q
```

A. `!(p && q)` B. `!p && q` C. `!p || !q` D. `!(p || q)` E. `!(p ^ q)`

QUESTION 8

What is output by the code to the right?

A. `0123`

B. `03`

C. `123`

D. `012`

E. `23`

```
int theNum = 4;
if(theNum > 2)
  System.out.print(0);
else{
  if(theNum < 5){
    System.out.print(1);
  }
  else{
    System.out.print(2);
  }
}
System.out.print(3);
```

QUESTION 9

Which of the following could replace **<*1>** in the code of class `LightBulb` to the right so that method `brighter` would triple the value of `watts`?

A. `watts *= 2;`

B. `watts = watts * 4;`

C. `watts = watts * 3;`

D. A and B only.

E. A, B, and C.

```
public class LightBulb
{
  private double watts;

  public LightBulb(double w){
    watts = w;
  }

  public void brighter(){
    <*1>
  }

  public double getWatts(){
    return watts;
  }
}

////////////////////////////////////////
//client code
LightBulb bub = new LightBulb(30);
bub.brighter();
System.out.println(bub.getWatts());   //1
```

QUESTION 10

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

A. `9.0`

B. `30`

C. `90.0`

D. `60.0`

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

QUESTION 11

What is output by the code to the right?

A. `2` B. `3` C. `4` D. `11` E. `8`

```
System.out.println(15 & 19);
```

QUESTION 12

How many lines of output does the code to right produce?

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

```
System.out.printf("UiL\nis\nfun\nn");
```

QUESTION 13

What is output by the code to the right?

A. `7.0` B. `8.0` C. `7` D. `8`

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

```
Double big = Math.min(7,8);
System.out.println(big);
```

QUESTION 14

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

A. `11`

B. `22`

C. `13`

D. `8`

E. `15`

```
public static int doIt(int what)
{
  what = what * 3;
  what = what / 2;
  what = what - 8;
  return what;
}

////////////////////////////////////////
//client code
System.out.println(doIt(20));   //1
```

QUESTION 15

What is output by the code to the right?

A. `true` B. `false` C. `no` D. `yes` E. `is`

```
Object j = "statebound";
boolean is = j instanceof String;
System.out.print(is);
```

QUESTION 16

What is output by the code to the right?

A. `322+2` B. `52+2` C. `9` D. `324`

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

```
System.out.print(3 + 2 + "2+2");
```

QUESTION 17

Which of the following could replace **`<*1>`** in the code to the right to correctly define variable `storage`?

A. `float` B. `Float` C. `Long`

D. `double` E. More than one of these.

```
<*1> storage = 9.2;
```

QUESTION 18

What is output by the code to the right?

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

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

QUESTION 19

What is output by the code to the right?

A. `[1, 8, 6, 4, 2]`

B. `[2, 4, 6, 8, 1]`

C. `[2, 4, 6, 8, 1, -1]`

D. `[2, 6, 8]`

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

```
Integer[] z = {2,4,6,8,1,3};
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. `4.0` B. `0.0` C. `2.0` D. `-4` E. `-4.0`

```
double dbl = Math.abs(-2)*-2;
System.out.println(dbl);
```

QUESTION 21

Which of the following could replace **`<*1>`** in the code to the right in order to correctly refer `longSet` to a set object?

A. `new Set();`

B. `new TreeSet<Integer>();`

C. `new Set<Long>();`

D. `new HashSet<Long>();`

E. more than one of these

```
Set<Long> longSet = <*1>
```

QUESTION 22

What is returned by the method call `what(new int[]{3,4,5,6,7,8,9,90,0})` ?

A. `1` B. `6` C. `5` D. `2` E. `7`

QUESTION 23

What is returned by the method call `what(new int[]{0,1,5,2,7,11,9,6,8})` ?

A. `1` B. `6` C. `5` D. `2` E. `7`

```
public static int what(int[] x)
{
  int back=0;
  int old = x[x.length-1];
  for(int it : x)
  {
    if(it>old)
      ++back;
    if(it<old)
      --back;
    old = it;
  }
  return back;
}
```

QUESTION 24

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

A. `[1, 3, 5, 7, 9]`

B. `[2, 3, 4, 7, 9]`

C. `[4, 0, 0, 0]`

D. `[2, 6, 4, 7, 9]`

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

QUESTION 25

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

A. `[1, 3, 5, 7, 9]`

B. `[2, 3, 4, 7, 9]`

C. `[4, 0, 0, 0]`

D. `[2, 6, 4, 7, 9]`

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

QUESTION 26

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

A. `[2, 6, 4, 7, 9]`

B. `[2, 3, 4, 7, 9]`

C. `[0, 0, 0, 0]`

D. `[0, 6, 0, 0]`

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

```
public class UpGoRun
{
   public static void up(int[] a){
      a[0] = 2;
      a[2] = 4;
   }

   public static void go(int[] b){
      b = new int[4];
      b[0] = 4;
   }

   public static void run(int[] c){
      c[1] = 6;
      c =  new int[4];
   }
}

////////////////////////////////////////
//client code
int[] br = {1,3,5,7,9};

UpGoRun.up(br);
out.println(Arrays.toString(br));    //1

UpGoRun.go(br);
out.println(Arrays.toString(br));    //2

UpGoRun.run(br);
out.println(Arrays.toString(br));    //3
```

QUESTION 27

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

A. `0`

B. `10`

C. `null`

D. a memory address

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

QUESTION 28

The array of linked lists defined in the code to the right would most commonly be used to create which of the following data structures?

A. a heap

B. a stack

C. a hash table

D. a priority queue

E. a binary search tree

```
LinkedList[] guess;
guess = new LinkedList[10];

System.out.println(guess[2]);   //1
```

QUESTION 29

What is returned by the method call `wow(-17)` ?

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

QUESTION 30

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

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

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

QUESTION 31

What is output by the code to the right?

A. 18 B. 20 C. 26 D. 23 E. 24

```
System.out.println(07 + 0x13);
```

QUESTION 32

What type of tree traversal is shown by the code to the right?

A. in-order traversal
B. post-order traversal
C. pre-order traversal
D. reverse-order traversal
E. level-order traversal

```
public void print(TreeNode tree)
{
   if(tree != null)
   {
      print(tree.getRight());
      out.println(tree.getValue());
      print(tree.getLeft());
  }
}
```

QUESTION 33

Which of the following could replace **<*1>** in the code to the right so that `it` would refer to an iterator for `q`?

A. `q.iterator();` B. `map.iterator();`
C. `q.getIterator();` D. `next();`
E. `q.keySet().iterator();`

QUESTION 34

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

A. 8 B. 7 C. 4 D. 2 E. 6

QUESTION 35

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

A. 8 B. 7 C. 4 D. 2 E. 6

```
Map<String, Integer> map;
map = new TreeMap<String, Integer>();

Queue<Integer> q;
q = new LinkedList<Integer>();

map.put("x", 6);
map.put("b", 2);
map.put("z", 7);
map.put("a", 4);
map.put("y", 8);


for(String sym : map.keySet())
   q.add(map.get(sym));

Iterator<Integer> it = <*1>
out.println(it.next());          //1
out.println(it.next());          //2
```

QUESTION 36

Which of the following replaces **<*1>** in the `test` code to the right so that `min` will be assigned whichever of the array lengths is the smallest?

A. `Math.min(x.length,y.length);`
B. `x.length < y.length ? x.length : y.length;`
C. `x.length < y.length ? y.length : x.length;`
D. A and B only
E. A, B, and C

QUESTION 37

Assuming that **<*1>** is filled correctly so that min contains the length of the shortest array, what is the general purpose of method `test`?

A. to determine if `x` has the same items as `y` in the same order
B. to determine if `y` has more items than `x`
C. to determine if `x` has the same number of items as `y`
D. to determine if `x` more items than `y`
E. it is impossible to determine the purpose of test

```
public class What
{
  public boolean test(int[] x, int[] y)
  {
    int min = <*1>
    for(int i=0; i<min; i++)
    {
      if(x[i]!=y[i])
        return false;
    }
    return true;
  }
}
```

QUESTION 38

Assume that method `superSort(Object[] objs)` is O(N) where N = `obj.length`. When method `superSort` is passed an Object array of length 10000 it takes 0.20 seconds for method `superSort` to complete. If method `superSort` is passed an Object array of length 2500, how many seconds would it take `superSort` to complete?

A. 0.10

B. 0.05

C. 0.25

D. 0.025

E. 0.125

QUESTION 39

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

A. `2`

B. `4`

C. `5`

D. `3`

E. There is no output due to a `NullPointerException`.

QUESTION 40

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

A. `2`

B. `4`

C. `5`

D. `3`

E. There is no output due to a `NullPointerException`.

```
public class Hook
{
   private Object store;
   private Hook next;

   public Hook(Object s, Hook n){
      store = s;
      next = n;
   }

   public Object getStore()
   {
      return store;
   }

   public Hook getNext()
   {
      return next;
   }
}

//////////////////////////////////////////
//client code
Hook hook1 = new Hook(4, null);
Hook hook2 = new Hook(3, hook1);
Hook hook3 = new Hook(2, hook2);
Hook hook4 = new Hook(1, hook3);

Hook what = hook4.getNext().getNext();

System.out.println(what.getStore());  //1

what = what.getNext().getNext();
System.out.println(what.getStore());  //2
```