Note: Correct responses are based on Java, **J2sdk v 1.7.25**, 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. **For all output statements, assume that the System class has been statically imported…** ***import static java.lang.System.*;***

QUESTION 1

Which of these is NOT equivalent to $527_8 + 910_{10}$?

A. 1253_{10} B. 2345_8 C. $4E5_{16}$ D. 1001100101_2 E. All are equivalent

QUESTION 2

What is output by the code to the right?

A. `1.7` B. `2.4` C. `5.2`

D. `5.4` E. `7.5`

```
out.println(23 / 4 + 9.4 % 3);
```

QUESTION 3

What is output by the code to the right?

A. `Atrue`
B. `true`
C. `falseA`
D. There is no output due to a compile error.
E. There is no output due to a runtime error.

```
out.printf("%s%s",false,'A',"true");
```

QUESTION 4

What is output by the code to the right?

A. `falsefalse` B. `falsetrue`

C. `truefalse` D. `truetrue`

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

```
String s = "Tortuga";
out.print(s.contains("tor"));
out.println(s.contains("tug"));
```

QUESTION 5

What is output by the code to the right?

A. `true` B. `false`

C. There is no output due to a compile error.

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

```
boolean p = false;
boolean q = false;
out.println(!(p^q));
```

QUESTION 6

What is output by the code to the right?

A. `14.0` B. `14`

C. `15.0` D. `15`

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

```
out.printf("%.1f",Math.sqrt(225));
```

QUESTION 7

What is output by the code to the right?

A. `0 88 3.0` B. `0 120 3.0`

C. `2 86 3.14` D. `2 118 3.14`

E. There is no output due to an error.

```
int x = 15;
int y = 'X';
double z = 3.14;
y -= x %= z;
out.println(x+" "+y+" "+z);
```

QUESTION 8

What is output by the code to the right if the values for <input1> and <input2> were "xoxoxo" and 2?

A. 2 B. 3 C. 4

D. 5 E. 7

QUESTION 9

In the code to the right, what values for <input1> and <input2> would result in an output of 10?

A. "o" 0 B. "xox" 2

C. "xoxo" 0 D. None of these

E. More than one of these.

```
String s = <input1>;
int k = <input2>;
int sum = 0;
switch(s.substring(k))
{
  case "xoxo"  : sum+=4;break;
  case "oxoxo" : sum+=3;
  case "xo"    : sum+=2;break;
  case "x"     : sum+=1;
  case "o"     : sum *= 10;
}
out.println(sum);
```

QUESTION 10

What is output by the code to the right?

A. 0 B. 1 C. 6

D. 7 E. 8

```
int j = 10000000,c=0;
do{
   j/=10; c++;
  }while(j>1);
out.println(c);
```

QUESTION 11

What is output by the code to the right?

A. 6.6 B. 8.0 C. 8.8

D. 13.2 E. 19.8

```
  double [] list = {1.1,2.2,3.3};
  list[1]=list[2]*2;
  list[2]=list[1]*3;
  out.printf("%.1f\n",list[2]);
```

QUESTION 12

Consider the data file below and code segment to the right. Assume the Scanner f object has been correctly linked to the file shown below. What is the last output of the code to the right?

```
3
The Cosmos is all that is
or ever was, or
ever will be.
```

A. The B. or

C. ever D. ever will be

E. or ever was, or

```
Scanner f = <link to data file>;
out.println(f.nextInt());
out.println(f.nextLine());
out.println(f.nextLine());
out.println(f.next());
```

QUESTION 13

What is output by the code to the right?

A. 0 B. 1

C. 2 D. 3

E. 4

```
double x = 0.0; int y = 0;
double z = Math.toRadians(360);
do{
     x+=Math.PI;
     y++;
}while(x<=z);
out.println(y);
```

QUESTION 14

What is output by the code to the right?

A. true B. false

C. There is no output due to a compile error.

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

```
boolean b = true && false | true;
out.println(b);
```

QUESTION 15

What is output by the code to the right?

A. 4 B. 8 C. 16

D. 32 E. 64

```
out.println(Double.SIZE);
```

QUESTION 16

What is output by the code to the right?

A. TomDickHarry

B. TomDickLarry

C. DickHarryHarry

D. DickHarryLarry

E. TomMoeLarry

```
ArrayList<String> list = new
 ArrayList<String>();
list.add("Tom");
list.add("Dick");
list.add("Harry");
list.add("Larry");
list.add("Moe");
list.add("Curly");
out.print(list.get(1));
Collections.sort(list);
out.print(list.get(2));
Collections.reverse(list);
out.println(list.get(3));
```

QUESTION 17

Question Omitted

QUESTION 18

Which of the following is NOT an output of the code segment to the right?

A. 0000 B. 0100 C. 0110

D. 1100 E. 1110

```
for(int p = 0;p <= 1; p++)
 for(int q = 0;q <= 1; q++)
  for(int r = 0;r <= 1; r++)
  {
      boolean P = p==1;
      boolean Q = q==1;
      boolean R = r==1;
      boolean S = (P|Q)&(P&!R);
      int s = S?1:0;
      out.print(""+p+q+r+s+" ");
  }
```

QUESTION 19

What is output by the code to the right?

A. 42 B. 126 C. 976

D. 1976 E. 2014

```
int x = <the year of this UIL test>;
int y = <# of pounds in one ton>;
int z = <square ft in a square yd>;
out.println(x%y*z);
```

QUESTION 20

What is output by the code to the right?

A. 67 B. 604 C. 1611

D. 3021 E. 4028

```
int y = 2014;
out.println(y<<3>>>2<<4/10);
```

QUESTION 21

What is output by the `client code` to the right?

A. `160.00` B. `400.00` C. `520.00`

D. `560.00` E. `590.00`

```
static double myst(double a,double b)
{
  double c = 0;
  if(a>48.0)
     {c+=(a-48)*2*b; a=48;}
  if(a>40.0)
     {c+=(a-40)*3/2*b; a=40;}
  c+=a*b;
  return c;
}
//client code
out.printf("%.2f\n",myst(50,10));
```

QUESTION 22

What is output by the code to the right?

A. `Iwttowns!` B. `IIwttowns!`

C. `Iwttownse` D. `IIwttownse`

E. There is no output due to an error.

```
String s = "I want to win state!";
String [] ss = s.split(" ");
String w = "";
for(String b:ss)
{
  char [] list = b.toCharArray();
  w+=""+list[0]+list[list.length-1];
}
out.println(w);
```

QUESTION 23

What is output by the code to the right?

A. `truetruetrue`

B. `truefalsetrue`

C. `truetruefalse`

D. `falsefalsetrue`

E. `falsefalsefalse`

```
String s = "1a2b3c4d5e";
boolean p = s.matches(".*\\d\\w.+");
boolean q = s.matches(".\\D\\S.*");
boolean r = s.matches("[abc]+");
  out.println(""+p+q+r);
```

QUESTION 24

What is output by `statement 1` in the client code to the right?

A. `3`

B. `4`

C. `5`

D. `6`

E. `7`

QUESTION 25

What is output by `statement 2` in the client code to the right?

A. `5`

B. `6`

C. `7`

D. `8`

E. `9`

```
static int A(int m, int n)
{
  if(m==0)
     return n+1;
  if(m!=0&&n==0)
     return A(m-1,1);
  if(m!=0&&n!=0)
     return A(m-1,A(m,n-1));
  return 0;
}
//statement 1
out.println(A(1,3));
//statement 2
out.println(A(2,3));
```

QUESTION 26

Which of the following concepts is NOT represented by the code to the right?

A. inheritance
B. polymorphism
C. overloading
D. overriding
E. All are represented

QUESTION 27

Which of these best replaces **<statement 1>** in the code to the right?

A. `Comparable o`
B. `Object o`
C. `Ork o`
D. `Mork o`

QUESTION 28

What is output by **`segment one`** in the client code to the right?

A. `Ork 0 3 Mork -1 4 Mork -1 0`
B. `Ork 0 3 Mork -1 4 Ork -1 0`
C. `Ork 0 3 Mork -1 4 Mork -1 4`
D. `Ork 0 3 Mork -1 4 Ork -1 4`
E. There is no output due to an error.

QUESTION 29

What is output by **`segment two`** in the client code to the right?

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

```
public class Ork implements
     Comparable<Ork>{
  int snark,shazbat,nanu;
public Ork(){}
public Ork(int n, int s, int u){
  snark=n;shazbat=s;nanu=u;
}
public String toString(){
  return "Ork "+(snark+shazbat-nanu);
  }
public int compareTo(<statement 1>){
  int x = snark+shazbat-nanu;
  int y = o.snark+o.shazbat-o.nanu;
  return x>y?1:x<y?-1:0;
}
}
class Mork extends Ork
{
  int nanu;
public Mork(){}
public Mork(int n, int s,
           int u, int a)
{
  snark=n;shazbat=s;nanu=u;
  this.nanu=a;
}
public String toString()
{
  return "Mork "+(snark+shazbat-
nanu);
}
}
//client code
  Ork one = new Ork(1,2,3);
  Mork two = new Mork(1,2,3,4);
  Ork trey = new Mork(1,2,3,4);
//segment one
  out.print(one+" "+one.nanu+" ");
  out.print(two+" "+two.nanu+" ");
  out.println(trey+" "+trey.nanu);
//segment two
  out.print(one.compareTo(two)+" ");
  out.print(trey.compareTo(two)+" ");
  out.println(two.compareTo(one));
```

QUESTION 30

What is output by the code to the right?

A. `000000000000000` (15 zeroes)
B. `111111111111111` (15 ones)
C. `00000000000000000111111111111111` (17 0s, 15 1s)
D. `11111111111111110000000000000000` (17 1s, 15 0s)
E. There is no output due to an error.

```
short s = Short.MAX_VALUE;
String t = Integer.toBinaryString(s);
out.println(t);
```

QUESTION 31

Which of the following correctly replaces `<value>` in the code to the right in order to output the value 1?

A. `3` B. `8` C. `9`

D. `10` E. `1000`

```
int x = <value>;
out.println(1000>>>x);
```

QUESTION 32

Which of the following represents the missing lines **<?>** in the output shown in the code to the right?

A.

```
0x1.cp1
0x1.0p2
0x1.4p2
```

B.

```
0x1.0p2
0x1.4p2
0x1.8p2
```

C.

```
0x1.fp1
0x1.5p2
0x1.9p2
```

D.

```
0x1.0p2
0x1.2p2
0x1.4p2
```

E.

```
0x1.10p2
0x1.12p2
0x1.14p2
```

```
double d = 1.0;
while(d<11.0)
out.println(Double.toHexString(d++));

//partial output
0x1.0p0
0x1.0p1
0x1.8p1
<?>
<?>
<?>
0x1.cp2
0x1.0p3
0x1.2p3
0x1.4p3
```

QUESTION 33

What is output by the code to the right?

A. `18` B. `19` C. `21`

D. `24` E. There is no output due to an error.

```
int [] list = new int[10];
Arrays.fill(list,1,10,1);
Arrays.fill(list,2,9,2);
Arrays.fill(list,3,8,3);
int sum=0;
for(int x:list)
 sum+=x;
out.println(sum);
```

QUESTION 34

What is output by the code to the right?

A. `This tess is ss eass.`

B. `This tesst is sso eassy.`

C. `Thisstess issss eass.`

D. `Thiss tesst iss sso eassy.`

E. There is no output due to an error.

```
String s = "This test is so easy.";
String t = s.replaceAll("s\\w","ss");
out.println(t);
```

QUESTION 35

In the chart to the right, representing the most restrictive bound on the runtime of each process in each scenario, where N represents the number of items in list, how many scenarios have a runtime of O(N)?

A. 0
B. 2
C. 6
D. 8
E. 10

Algorithm	Scenarios/Big O Time Complexity		
	Best	Average	Worst
Quicksort	?	?	?
Mergesort	?	?	?
Heapsort	?	?	?
Bubble Sort	?	?	?
Insertion Sort	?	?	?
Selection Sort	?	?	?

QUESTION 36

Using the same chart, how many scenarios have a runtime of O(N^2)?

A. 6
B. 7
C. 8
D. 9
E. 10

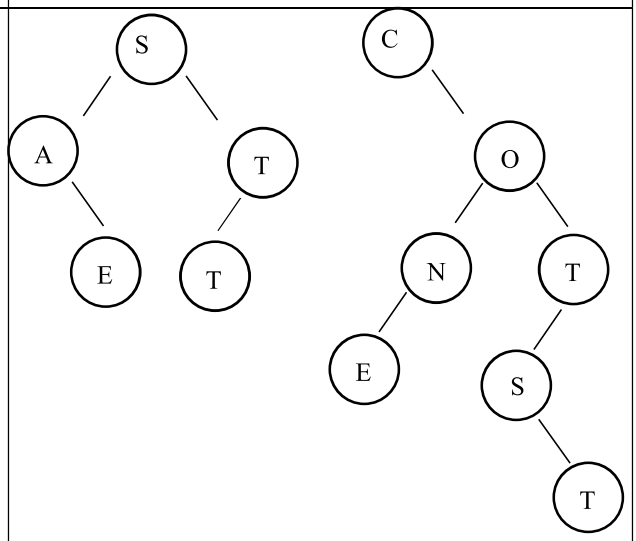
QUESTION 37

To the right is a graph made up of two binary search trees for the strings STATE and CONTEST.

The internal path length of the STATE tree is 6, which means that the total number of steps from each non-root node back to the root is 6. The A and T nodes are each 1 step away, and the E and T nodes are each 2 steps away, for a total of 6 steps.

What is the internal path length of the CONTEST tree ?

A. 6 B. 10 C. 12
D. 15 E. 22



QUESTION 38

How many nodes in this graph (both trees) have only one child?

A. 5 B. 6 C. 7
D. 8 E. 9

QUESTION 39

After the push and pop sequence shown on the right involving two parallel stacks, where the first argument of each command corresponds with the first stack, and the second argument to the second stack, which value would be the next one popped from the second stack?

A. 1 B. 2
C. 3 D. 6
E. 9

```
Push 4 5
Push 1 2
Push 6 3
Pop x y
Push 9 7
Pop x y
Push 5 8
Pop x y
```

QUESTION 40

In a directed graph such as the one on the right, there are often simple paths (no repeated nodes) that form a cycle (back to the starting node), such as these two examples, CGC (also named GCG) and ABCGDA (also named BCGDAB and CGDABC). How many unique cycles are there in this graph?

A. 4

B. 5

C. 6

D. 7

E. 8