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 118_{10} minus 29_{16} ?

A. 1001100_2 B. 79_{10} C. 1011001_2 D. $4D_{16}$ E. 89_{10}

QUESTION 2

What is output by the code to the right?

A. 144   B. 12144

C. 156.0   D. 156

E. 144.0

```
double k = 11;
double j = k++ * k;
System.out.println(k+j);
```

QUESTION 3

What is NOT a possible output of the code to the right?

A. 24   B. 15   C. 26   D. 12   E. 17

```
Integer k = (int)(Math.random()*15);
k += 11;
System.out.println(k);
```

QUESTION 4

How many lines are printed by the code on the right?

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

E. There are infinitely many lines printed by this code.

```
double i = 1;
while(i > 0.1)
{
   out.println(i);
   i/=2;
}
```

QUESTION 5

What is output by the code to the right?

A. ewind Run   B. wind Run

C. Run Rinc   D. Run Rincewind Run

E. There is not output due to a syntax error.

```
String str;
str = "Run Rincewind Run";
str.substring(str.length()/2);
out.println(str);
```

QUESTION 6

What is stored in x by the code to the right?

A. [1, 1, 2, 2, 4, 4, 8, 8, 16, 16]

B. [0, 0, 2, 3, 4, 7, 11, 21, 34, 55]

C. [1, 1, 2, 3, 5, 8, 13, 21, 34, 55]

D. [1, 1, 3, 2, 8, 5, 21, 13, 55, 34]

E. There is not output due to a runtime error.

```
int[] x = new int[10];
x[0] = x[1] = 1;
for(int i=2; i<10; i++)
   x[i] = x[i-1] + x[i-2];
```

QUESTION 7

What is output by the code to the right?

A. true_true   B. true_false

C. true_false_true   D. false_true

E. false_false

```
boolean a = true;
boolean b = false;
boolean c = true;
out.print(a || !b && b || !c);
out.print("_");
out.print(a && b || !c);
```

QUESTION 8

What is the output by the code to the right?

A. `Gen XMilliniumIGen`

B. `Gen X`

C. `?`

D. `Gen XMilliniumIGen?`

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

```
String y;
double x = 2;
switch(x)
{
    case 1: y = "Baby Boomer";
    case 2: y = "Gen X";
    case 3: y = "Millinium";
    case 3.5: y = "IGen";
    default: y = "?";
}
out.println(y);
```

QUESTION 9

What could the code to the right be used for?

A. to see if x can be converted to minutes

B. to see if x can be converted to dimes

C. to see if x can be converted to months

D. to see if x is odd

E. to see if x is even

```
if( x % 10 == 0 )
    out.println("Yes");
else
    out.println("No");
```

QUESTION 10

Which of the following code segments could be used to replace **<*1>** in the code to the right without causing a syntax error?

A.
```
public WorldDisk(int t, int w)
{
    numTrolls = t;
    numWizards = w;
}
```
B.
```
public void WorldDisk(int t, int w)
{
    numTrolls = t;
    numWizards = w;
}
```
C.
```
public WorldDisk(int t)
{
    setTrolls(t);
    setWizards(0);
}
```
D.
```
public WorldDisk()
{
    setTrolls(0);
    setWizards(0);
}
```
E. More than one of these.

```
public class WorldDisk
{
    private int numTrolls, numWizards;


    <*1>


    public void setWizards(int w)
    {
        numWizards = w;
    }

    public void setTrolls(int t)
    {
        numTrolls = t;
    }

    public String toString()
    {
        return numTrolls+" "+numWizards;
    }
}
```

QUESTION 11

Which of the following is NOT a part of the Math class?

A. `floor(x)`   B. `cbrt(x)`   C. `PI`   D. `sin(x)`   E. `rand(x)`

QUESTION 12

What is output by the code to the right?

A. `$-175?2.843264`   B. `$-3d?2.8433`

C. `$175?2.843`   D. `$175?2.84264`

E. There is no output due to a run-time error.

```
out.printf("$-3d?%5f",175,2.843264);
```

QUESTION 13

Which of the following code segments would create the output to the right?

A. `out.print("\"\"\\\\' ");`
   `out.print("\"\\\\\\");`

B. `out.println("\"\"\\\\\'\n\\\"\\\\\\");`

C. `out.println("\"\"\\\\\'\n\\\"\\\\\\\");`

D. `out.println(""\\'\n\\\\");`

E. more than one of these

```
""\\'
\"\\\
```

QUESTION 14

What is the output by the code to the right?

A. `60`   B. `10`

C. `123`   D. `33`

E. `23`

```
int count =0;
int[][] list = {{21,14,7},
   {36,23,10},{1,3,8}};
for(int i = 0; i<3; i++)
    for(int j = 0; j<3; j++)
        if((i+j)%2==0)
            count+=list[i][j]-10;
out.println(count);
```

QUESTION 15

What is the output by the code to the right?

A. `1000.00 32.62 6.71`   B. `1000.0 32.0 6.0`

C. `1000 32 6`   D. `precision error`

E. There is no output due to an infinite loop.

```
for(double i = 1000; i>=5; i++)
{
  out.printf("%.2f ",i);
  i=Math.sqrt(i);
}
```

QUESTION 16

What is the output by the code to the right?

A. `uaguabwagaa`   B. `ummigummibwigimmi`

C. `uiguibwigii`   D. `ummagummabwagamma`

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

```
String str = "ummagummabwagamma";
str = str.replaceAll("mm","");
str = str.replaceAll("a","i");
out.println(str);
```

QUESTION 17

What is the output by the code to the right?

A. `true`   B. `1073741824`

C. `236`   D. `14`

E. `false`

```
out.println(42<<2|27<<2);
```

QUESTION 18	
Assume A, B, and C are boolean variables. Which of the lines of code to the right are equivalent? A. none of the lines are equivalent B. I and II C. I and III D. II and III E. I, II, and III	``` I. !(A && B) || !A && !B II. !A && !B III. !(A || B) && !A && !B ```

QUESTION 19	

What is the output by the code to the right?
 	
A. [9, 2, 5, 7]
 	
B. [9, 2, 1, 7]
 	
C. [9, 6, 1, 7]
 	
D. [9, 6, 7]
 	
E. There is no output due to a run-time error.
	``
	ArrayList<Integer>list;
	list = new ArrayList<Integer>();
	list.add(9);
	list.add(1);
	list.add(2);
	list.add(1,6);
	list.set(5,1);
	list.remove(2);
	list.remove(1);
	list.add(7);
	out.println(list);
	``

QUESTION 20	

How many Noggs are print out by the code to the right?
 	
A. 4   B. 5   C. 0   D. 9
 	
E. There is no output due to an infinite loop.
	``
	int granny = 5;
	while(granny>0){
	  out.print("Nogg");
	  granny = ++granny%9;
	}
	``

QUESTION 21	

What is output by the code to the right?
 	
A. Rangersgersrs
 	
B. Rangersgersrss
 	
C. RangersRangersRangersRangers
 	
D. There is no output due to a syntax error.
 	
E. There is lots of output due to an infinite loop.
	``
	String n = "Texas Rangers";
	do
	{
	  n = n.substring(n.length()/2);
	  out.print(n);
	}while(!n.isEmpty());
	``

QUESTION 22	

`String[] list = {"DC","DC","DC","DC"};`
 	
What is returned by the method call `price(list)`?
 	
A. 7.5   B. 12.0
 	
C. 13.0   D. 10.0
 	
E. There is no output due to a run-time exception.
	``
	public double price(String[] list)
	{
	  double price = 0;
	  for(int i=0; i<list.length; i++)
	  {
	    if(list[i].equals("DC"))
	      price+=2.50;
	    else
	      i++;
	    price+=.75;
	  }
	  return price;
	}
	``

QUESTION 23	

`String s = "DC Im DC Mv DC DC DC";`
 	
`String[] list = s.split(" ");`
 	
What is returned by the method call `price(list)`?
 	
A. 20.25   B. 14.0
 	
C. 10.0   D. 11.25
 	
E. There is no output due to a run-time exception.	

QUESTION 24

Which of the following correctly replaces **<*1>** in the code to the right in order to compare an object's level to an opponent's level?

A. `this.getLvl() > super.getLvl()`

B. `this.level > super.level`

C. `getLvl() > opp.getLvl()`

D. `level > opp.level`

E. more than one of these

QUESTION 25

Which of the following correctly replaces **<*2a> <*2b>** in the code to the right in order to increase the winning person's level and decrease the losing person's level?

	<*2a>	**<*2b>**
A.	`lvl++;` `opp.lvl()--;`	`lvl--;` `opp.lvl++;`
B.	`this.changeLvl(1);` `that.changeLvl(-1);`	`this.changeLvl(-1);` `that.changeLvl(1);`
C.	`changeLvl()++;` `opp.changeLvl()--;`	`changeLvl()--;` `opp.changeLvl()++`
D.	`changeLvl(1);` `opp.changeLvl(-1);`	`changeLvl(-1);` `opp.changeLvl(1);`
E.	more than one of these	

QUESTION 26

What is output by the code to the right?

A. `Harry8`

B. `Rincewind8`

C. `Harry6`

D. `Rincewind10`

E. `Rincewind9`

```java
class Magic{
  private String name;
  private int level;

  public Magic(String n, int lvl)
  {
     name = n;
     level = lvl;
  }

  public String getName()
  {
     return name;
  }

  public int getLvl()
  {
     return level;
  }

  public void changeLvl(int x)
  {
     level+=x;
  }
}

class Duel extends Magic{
  public Duel(String n, int lvl)
  {
     super(n, lvl);
  }

  public void battle(Duel opp)
  {
     // checks lvl > opp's lvl
     if( <*1> )
     {
        // increase lvl,
        // decrease opp's lvl
        <*2a>
     }
     else
     {
        // decrease lvl
        // increase opp's lvl
        <*2b>
     }
  }
}

/////////////////////////////////
// client code
Duel a = new Duel("Rincewind",9);
Duel b = new Duel("Harry", 7);
b.battle(a);
out.println(a.getName()+a.getLvl());
```

QUESTION 27

What does the list look like at the end of the code to the right?

A. [33, 12, 7, 13, 49, 40, 32, 34, 13]

B. [7, 12, 13, 13, 32, 33, 34, 40, 49]

C. [33, 7, 12, 13, 40, 49, 32, 34, 13]

D. [33, 12, 7, 13, 40, 49, 32, 34, 13]

E. [33, 12, 7, 13, 32, 40, 49, 34, 13]

QUESTION 28

What kind of sort is mystery ?

A. quick sort

B. insertion sort

C. bubble sort

D. merge sort

E. selection sort

```java
public static void mystery(int[]
            list, int x, int y)
{
  if(x<y)
  {
    int c = (x+y)/2;
    mystery(list,x,c);
    mystery(list,c+1,y);
    terry(list,x,c,y);
  }
}

public static void terry(int[] list,
            int x, int c, int y)
{
  int[] temp = new int[y-x+1];
  int i = 0;
  int lt = x;
  int rt = c+1;
  while(lt<=c && rt<=y)
  {
    if(list[lt]<list[rt])
      temp[i++]=list[lt++];
    else
      temp[i++]=list[rt++];
  }
  while(lt<=c)
    temp[i++]=list[lt++];
  while(rt<=y)
    temp[i++]=list[rt++];
  i=0;
  for(;x<=y;x++)
    list[x]=temp[i++];
}

/////////////////////////////////
// client code
int[] list =
    {33,12,7,13,49,40,32,34,13};
mystery(list,2,6);
```

QUESTION 29

What is returned by the method call `mystery(10)`?

A. 20   B. 103   C. 5   D. 34   E. 62

QUESTION 30

What is returned by the method call `mystery(8)`?

A. 20   B. 103   C. 5   D. 34   E. 62

```java
public int mystery(int x)
{
  if(x>10)
    return 5;
  return mystery(x+1)+mystery(x+2)+x;
}
```
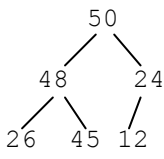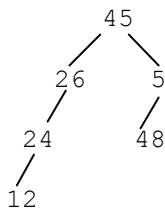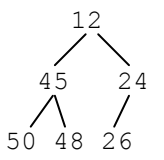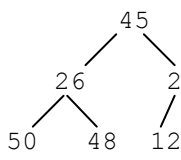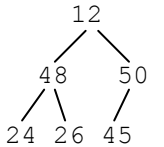
QUESTION 31

What is $AB_{16} + 1001_2 + 26_{10} = ?$

A. CD_{16} B. 317_8 C. 1001001_2 D. 11001111_2 E. 206_{10}

QUESTION 32

How would a max heap tree look for the following numbers: 45, 26, 24, 50, 48, 12?

A.
```
        50
       /    \
     48      24
    /  \    /
  26   45 12
```

B.
```
            45
           /    \
         26      50
        /       /
      24      48
     /
   12
```

C.
```
        12
       /    \
     45      24
    /  \    /
  50  48  26
```

D.
```
            45
           /    \
         26      24
        /  \    /
      50   48  12
```

E.
```
        12
       /    \
     48      50
    /  \    /
  24  26  45
```

QUESTION 33

Which of the following correctly replaces **<*1>** in the code to the right?

A. `Map<Integer, String> x`

B. `SortedMap<Integer, String> x`

C. `HashMap<Integer, String> x`

D. A and B only

E. A, B, and C

QUESTION 34

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

A. `{-2, 1, 2, 3}`

B. `{A=-2, Fistful=1, Yojimbo=2, Dollars=3}`

C. `{1=Fistful, -2=A, 3=Dollars, 2=Yojimbo}`

D. `{-2=A, 1=Fistful, 2=Yojimbo, 3=Dollars}`

E. `{A, Fistful, Yojimbo, Dollars}`

QUESTION 35

Assuming **<*1>** is filled correctly, what is output by `//line 3` in the code to the right?

A. `{-2=A, 0=Red, 2=Dead, 3=Redemption}`

B. `{A, Fistful, Dead, Redemption}`

C. `{-2, 0, 2, 3}`

D. `{-2, 0, 1, 2, 3}`

E. `{A=-2, 1=Fistful, 2=Dead, 3=Redemption}`

```
<*1> = new TreeMap<Integer,String>();
x.put(1,"Fistful");
x.put(-2,"A");
x.put(3,"Dollars");
x.put(2,"Yojimbo");
out.println(x);            //line 2
x.put(0,"Red");
x.remove(1);
x.put(2,"Dead");
x.put(3,"Redemption");
out.println(x);            //line 3
```

QUESTION 36

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

A. `21`

B. `6`

C. `9`

D. `17`

E. The output cannot be determined.

QUESTION 37

What is output by the code to the right?

A. `[44, 9, 18, 6, 23, 17]`

B. `[17, 18, 21, 23, 44, 45]`

C. `[21, 45, 44, 18, 23, 17]`

D. `[17, 18, 23, 45, 21, 44]`

E. The output cannot be determined.

```
Queue<Integer> pq;
pq = new PriorityQueue<Integer>();
pq.add(21);
pq.add(45);
pq.add(44);
pq.add(9);
pq.add(18);
pq.add(6);
pq.add(23);
pq.add(17);
pq.remove();
out.println(pq.remove());    // line 1
out.println(pq);             // line 2
```

QUESTION 38

What is output by the code to the right?

A. `20`   B. `1336`   C. `41`   D. `10`   E. `true`

```
System.out.println(167 >>> 3);
```

QUESTION 39

What is output by the code to the right?

A. `yam`   B. `doom`   C. `doomy`   D. `am`   E. `moody`

```
String s = "mayamoodybabydoomayam";
String[] list = s.split("y");
System.out.println(list[4]);
```

QUESTION 40

Which of the following string objects could reference `s` refer to in order to cause the code to the right to return true?

A. `lifefilm`

B. `mayamoodybabydoomayam`

C. `catastrophic`

D. `poodlehat`

E. `apluscompsci`

```
s.matches("[d-m]+")
```