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

What is 14_{10} plus $1F_{16}$?

A. $2B_2$ B. 101101_2 C. 43_{10} D. $2A_{16}$ E. 101110_2

QUESTION 2

What is output by the code to the right?

A. 7 B. 20 C. 2

D. 0 E. There is no output due to a run-time error

```
int x = 46321, y = 25;
int z = x/y%y/3;
out.println(z);
```

QUESTION 3

What is output by the code to the right?

A. 1234567890
   3.2000\"rfvtgbyhn\"

B. 1234567890
   3.2 \"rfvtgbyhn\"

C. 1234567890
   3.2 "rfvtgbyhn"

D. 1234567890
   3.20\"rfvtgbyhn\"

E. 1234567890
   3.2000"rfvtgbyhn"

```
String list = "rfvtgbyhn";
double num = 3.2;
out.printf("1234567890\n%.4f\"%s\"",
           num,list);
```

QUESTION 4

What is output by the code to the right?

A. f

B. d

C. l

D. j

E. k

```
String s = "ajdfkljeiojang";
char let = s.charAt(s.length()/3);
out.println(let)
```

QUESTION 5

What values for a, b, and c make the output to the right `true`?

A. b is true

B. a is true

C. d will always be false

D. d will always be true

E. c is true

```
boolean a, b, c, d;
d = b && c || a;
out.println(d);
```

QUESTION 6

What is the correct code for the equation to the right?

A. `y = Math.E^(2*x-1);`

B. `y = Math.pow(Math.exp,2*x-1);`

C. `y = Math.exp(2*x-1);`

D. `y = Math.E*(2*x-1);`

E. `y = Math.pow(2*x-1,Math.E);`

$$y = e^{2x-1}$$

QUESTION 7

What is output by the code to the right?

A. `150`

B. `151`

C. `0`

D. `1679766`

E. `1`

```
int a;
int x = 18;
int y = 3;
int z = 50;
a = y*z+(int)Math.pow(x%y,z/(2*y));
out.println(a);
```

QUESTION 8

What is output by the code to the right?

A. `BYBXEY`

B. `BY?XEY`

C. `BORNEO`

D. `LYBXOY`

E. `LORNOO`

```
String str = "BORNEO";
String s = "";
for(int i=0; i<str.length(); i++)
    if(str.charAt(i)>'J')
      s+=str.charAt(i);
    else
      s+=(char)(str.charAt(i)+10);
out.println(s);
```

QUESTION 9

What is output by the code to the right?

A. `5887116145174`

B. `174`

C. `134`

D. `5883104121134`

E. an infinite loop

```
int x = 29;
for(int i=x; i>10; i-=4)
{
    x+=i;
    out.print(x);
}
```

QUESTION 10

What is output by the code to the right?

A. `26` B. `11` C. `5` D. `-21`

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

```
int[] list = {25, 29, 13, 5, 26, 15};
for(int i=1; i<list.length-1; i++)
  list[i-1]-=list[i];
out.println(list[4]);
```

QUESTION 11

Which of the following values can be inputted thru the method `nextInt()`

I. `1.7` II. `1` III. `"1"`

A. I, II, & III

B. III only

C. I & III

D. II & III

E. I & II

QUESTION 12

What is output by the code to the right?

A. 8

B. 6

C. 13

D. 7

E. 5

```
int sum = 0;
String ans = "DADCCACBEEBEE";
for(int i=0; i<ans.length(); i++)
  if(ans.charAt(i)<'D')
    sum++;
out.println(sum);
```

QUESTION 13

Which of the following has the highest precedent in java?

A. &=

B. >>=

C. !=

D. /=

E. +=

QUESTION 14

What is output by the code to the right?

A. 0

B. 2

C. -2

D. -1

E. 1

```
out.print((byte)(Byte.MAX_VALUE*2));
```

QUESTION 15

What is output by the code to the right?

A. 10

B. 19

C. 45

D. 55

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

```
ArrayList<Integer> list;
list = new ArrayList<>();

for(int i=0; i<9; i++)
  list.add(i);

int sum = 0;
int x = 0;
while(!list.isEmpty())
{
  x = list.remove(x);
  sum+=x;
}
out.println(sum);
```

QUESTION 16

Which of the following correctly replaces **<*1>** in the code to the right such that `d` is instantiated?

A. `Dater d = new (1,7,1945);`

B. `Dater d = new Dater();`

C. `Dater d = new Dater(5,26,1968);`

D. `Dater d = new toString();`

E. more than one of these are correct

QUESTION 17

Which of the following code will replace **<*2>** in the code to the right such that it will override the `toString` method for the `Dater` class?

A.
```
private void toString()
{
   System.out.println(day+":"+mon+":"+yr);
}
```

B.
```
public void toString()
{
   System.out.println(day+":"+mon+":"+yr);
}
```

C.
```
public String toString()
{
   return day+":"+mon+":"+yr;
}
```

D.
```
private String toString()
{
   return day+":"+mon+":"+yr;
}
```

E. more than one of these are correct

```
class Dater
{
  private int day;
  private int mon;
  private int yr;

  public Dater(int d, int m, int y)
  {
          day = d%31;
          mon = m%12;
          yr = y;
  }

  <*2>

}

////////////////////////////////////
//CLIENT CODE
<*1>;
```

QUESTION 18

What is output by the loop before line **<*1>** in the code to the right?

A. `h W r W W`

B. `e a h h W`

C. `T y e e e`

D. `T h e W a`

E. `y W e W h`

QUESTION 19

What is output by the loop before line **<*2>** in the code to the right?

A. `y a W e h`

B. `T e r e h`

C. `h W r W W`

D. `T y e e e`

E. `e r e T h`

```
String str = "TheWayWeWhere";
char[][] mat = new char[5][5];
int x=0;
for(int i=0; i<mat.length; i++)
  for(int j=0; j<mat.length; j++)
  {
     mat[i][j]=str.charAt(x);
     x=(x+5)%str.length();
  }
for(int j=0; j<mat.length; j++)
  out.print(mat[1][j]+" ");
out.println();              //<*1>

  for(int j=0; j<mat.length; j++)
out.print(mat[j][1]+" ");  //<*2>
```

QUESTION 20

What is output by the code to the right?

A. `10100001`

B. `11111110`

C. `1000100`

D. `10111`

E. `10010010100010001000010111`

```
int x = 0x4451117;
x >>= 20;
out.print(Integer.toBinaryString(x));
```

QUESTION 21

What is output by line **<*1>** in the code to the right?

A. `rtyt`

B. `wryt`

C. `wrytt`

D. `wrytttt`

E. `wrywry`

QUESTION 22

What is output by line **<*2>** in the code to the right?

A. `qweqeyqey`

B. `qweyq`

C. `rtyty`

D. `qweyqey`

E. `qwew`

```
public static void
mys1(ArrayList<String> list)
{
 for(int i=0; i<list.size(); i++)
 {
  String s=list.get(i).toLowerCase();
  for(int j=0; j<s.length(); j++)
  {
     char y = s.charAt(j);
     int loc = (y-'a')%list.size();
     if(loc!=i)
       list.set(loc,list.get(loc)+y);
  }
 }
}

////////////////////////////////
//CLIENT CODE
ArrayList<String> p;
p = new ArrayList<>();

p.add("qwe");
p.add("rty");
p.add("qet");
p.add("wry");
mys1(p);

out.println(p.get(3)); //<*1>

out.println(p.get(0)); //<*2>
```

QUESTION 23

Which of the following correctly replaces **<*1>** and **<*2>** in the code to the right?

	<*1>	**<*2>**
A.	`interface`	`abstract class`
B.	`abstract class`	`interface`
C.	`abstract class`	`class`
D.	`interface`	`class`
E.	`class`	`abstract class`

QUESTION 24

Which of the following correctly replaces **<*3>** and **<*4>** in the code to the right?

	<*3>	**<*4>**
A.	`getX()`	`getY()`
B.	`x`	`y`
C.	`super.x`	`super.y`
D.	`B.getX()`	`B.getY();`

E. more than one of these are correct

QUESTION 25

Which of the following correctly replaces **<*5>** in the code to the right?

A.
```
super();
setX(m);
setY(n);
```

B.
```
super(m,n);
```

C.
```
x = m;
y = n;
```

D.
```
setX(m);
setY(n);
```

E. more than one of these are correct

QUESTION 26

What is output by the code on the right?

A. `Bongo3Bingo14Bongo11Bingo28Bingo35`

B. `BongoBingoBongoBingoBingo`

C. `314112835`

D. `3Bongo14Bingo11Bongo28Bingo35Bingo`

E. There is no output due to a syntax error

```
<*1> A
{
 public abstract int stuff();
 public abstract void other(int x);
}
<*2> B implements A
{
 private int x, y;
 public B(int c, int d)
 {
  x=c;
  y=d;
 }
 public int getX(){return x;}
 public int getY(){return y;}
 public void setX(int a) {x=a;}
 public void setY(int a) {y=a;}
 public void other(int k)
 {
  x = 2*k+y;
  y = k-2;
 }
 public void lot()
 {out.print ("Bongo");}
 public String toString()
 {return "B:"+x+" "+y; }
}
class C extends B
{
 public C(int m, int n)
 {<*5>}
 public void other(int q)
 {
  setX(q*3);
  setY( <*3> + q );
 }
 public int stuff()
 {
  out.print ("Bingo");
  return <*3>  +  <*4>;
 }
 public String toString()
 {return "C:" + <*3> + " " + <*4>;}
}

////////////////////////////////
////////CLIENT CODE/////////////
A[] list = new A[5];
list[0]=new B(1,2);
list[1]=new C(3,4);
list[2]=new B(1,4);
list[3]=new C(3,2);
list[4]=new C(2,4);
int y=1;
for(A x:list) {
  x.other(y++);
  out.print(x.stuff());
}
```

QUESTION 27

What is output by the code on the right?

A. `[blac,heli,null,acro,null,bord,alum,foil]`

B. `[blac,heli,comi,the,bord,alum]`

C. `[blac,heli,comi,null,the,bord,alum,null]`

D. `[blac,heli,acro,bord,alum,foil]`

E. There is no output due to a syntax error

```
LinkedList<String> list;
list =  new LinkedList<>();

list.add("blac");
list.add("heli");
list.add("comi");
list.add("acro");
list.add("the");
list.add("bord");
list.add("alum");
list.add("foil");

Iterator<String> iter;
iter = list.iterator();
iter.next();
iter.next();
iter.next();
iter.remove();
iter.next();
iter.next();
iter.remove();
out.println(list);
```

QUESTION 28

What is returned by the method call `mys2(36)`?

A. `8`

B. `7`

C. `4`

D. `5`

E. 6

QUESTION 29

How many recursive calls are made by the method call `mys2(223)`?

A. `5`

B. `9`

C. `7`

D. `13`

E. `11`

```
public static int mys2(int x)
{
  if(x>0&&x%3==0)
     return mys2(x/3)+1;
  else if(x>0&&x%2==0)
     return mys2(x/2)+2;
  else if(x>0)
     return mys2(x-1)-1;
  else
     return x;
}
```

QUESTION 30

Which of the following code would output `202` ?

A. `out.println(149&53);` B. `out.println(53^255);` C. `out.println(149^53);`

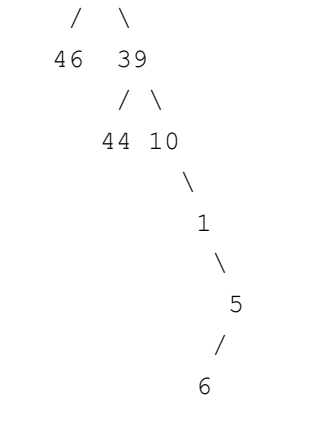
D. `out.println(53|149);` E. `out.println(255^149);`

QUESTION 31

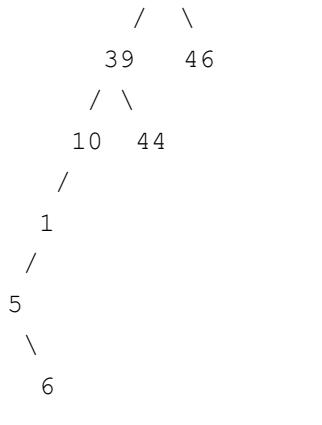
Which of the following is an example of a min-heap tree if the following values were entered in the following order?

45 39 46 10 1 44 5 6

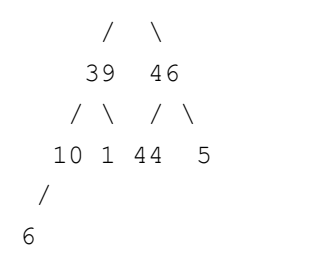
A.



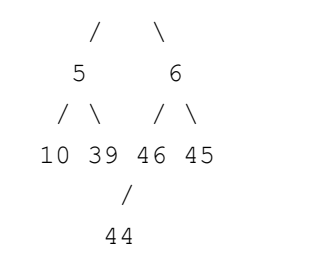
B.



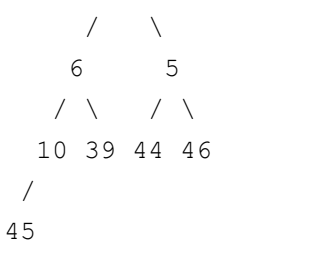
C.



D.



E.



QUESTION 32

What is output by the code on the right?

A. [f, o, a, h, a, y, o]

B. [f, i, a, h, y, S, o, n, a, o, a, l]

C. [f, a, h, y, S, o, a, o]

D. [S, y, h, a, i, f, a, o, a, n, o, y]

E. [S, y, h, a, f, a, o, u]

```
Stack<String> st = new Stack<>();
Stack<Character> ot = new Stack<>();
st.add("Say");
st.add("you");
st.add("hav");
st.add("an");
st.add("i");
st.add("fol");
for(int i=0; i<12; i++) {
  String x = st.pop();
  if(x.length()>1)
  {
     ot.push(x.charAt(0));
     st.add(0,x.substring(1));
  }
}
out.println(ot);
```

QUESTION 33

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

A. `map.key == i`

B. `map == i`

C. `map.containsKey(i)`

D. `map.contains(i)`

E. more than one of these are correct

```
int[] x = {3,2,4,7,2,8,3,7,2,0,1,2,
     1,9,4,6,0,1,3,8,3,6,0,4,2,1,5};

TreeMap<Integer,Integer> map;
map = new TreeMap<Integer,Integer>();

for(int i : x )
  if(  <*1>  )
     map.put(i,map.get(i)+1);
  else
     map.put(i,1);

out.println(map.values());
```

QUESTION 34

Assuming `<*1>` was filled correctly, what is output by the code on the right?

A. `[1, 1, 2, 2, 2, 3, 3, 4, 4, 5]`

B. `[4, 5, 6, 5, 4, 2, 3, 3, 3, 2]`

C. `[0, 1, 2, 3, 4, 5, 6, 7, 8, 9]`

D. `[1, 2, 3, 4, 5]`

E. `[3, 4, 5, 4, 3, 1, 2, 2, 2, 1]`

QUESTION 35

What is output by the code on the right?

A. `true true true true false`

B. `true true true false false`

C. `false true false false false`

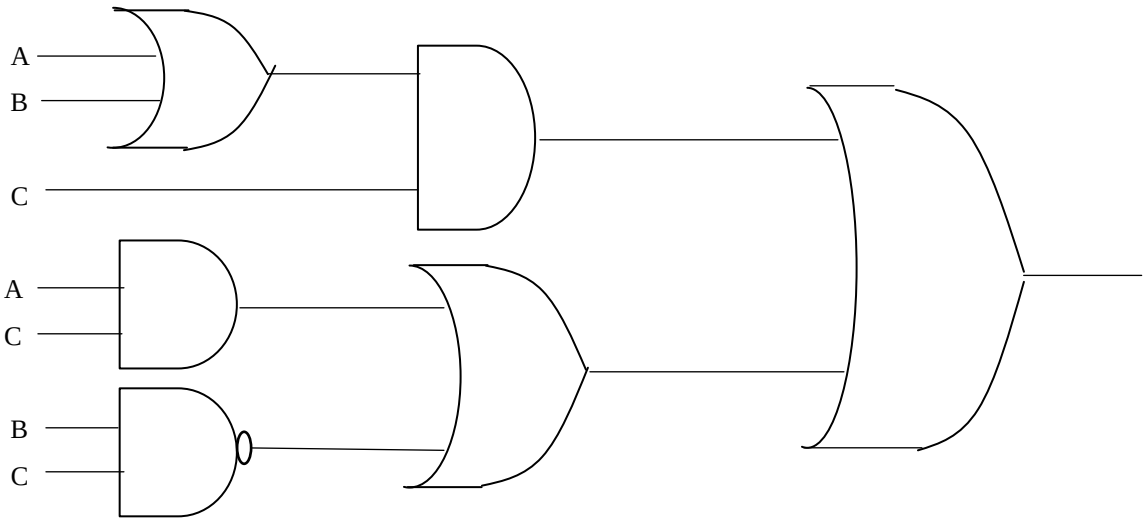
D. `true true true true true`

E. `true true false false false`

```
String word = "[pb].+s.+d";
String[] list = {"bpased","blasted",
          "pbusd","blsd","apraised"};
for(String x:list)
  out.print(x.matches(word)+" ");
```

QUESTION 36

Which of the following best represents the circuit given below.



A. $(AB+C)(A+C)\overline{(B+C)}$

B. $(A+B)C+\overline{(AC+BC)}$

C. $A+BC+AC+\overline{B}+\overline{C}$

D. $(AB+C)+((A+C)(B+C))$

E. $(A+B)C(AC+BC)$

QUESTION 37

Simplify the following Boolean algebra expression:

```
(AB+C)((A+C)!(B+C))+C!B(A+!C)
```

A. `A + C` B. `!BC` C. `A!BC` D. `!(B+C)` E. `AB + C`

QUESTION 38

Convert the postfix notation equation to the right into a infix notation equation.

A. `E/(A+B)+E/(C+A)+E/D`

B. `(E+A)/B+(E+C)/A+E/D`

C. `(E+A)/B+E/C+A/(E+D)`

D. `E+(A/B+E/C+A/E+D)`

E. `+/DE+/+ACE/+BAE`

```
EAB+/ECA+/+ED/+
```

QUESTION 39

OPEN ENDED QUESTION – Find the answer and write it on your answer sheet. If you are using a ScanTron form, write the question number and the answer on the bottom of the ScanTron.

What is the binary value of -30?

bit	bit	bit	bit	bit	bit	bit	bit

QUESTION 40

OPEN ENDED QUESTION – Fill in the blank spaces with the proper bits (1 or 0) and write it on your answer sheet. If you are using a ScanTron form, write the question number and the answer on the bottom of the ScanTron.

Evaluate the expression

```
((LCIRC-2(NOT(1101 AND 11001100)))XOR(RSHIFT-3(NOT(11100101))))
```

bit	bit	bit	bit	bit	bit	bit	bit