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 5_{10} times 66_{16} ?

A. 111111111_2 B. 509_{10} C. 110110110_{10} D. $1FE_{16}$ E. $1B6_{16}$

QUESTION 2

What is output by the code to the right?

A. 27 B. 21 C. 19 D. 18 E. 10

```
int x = 0b11010;
int y = x % 0b11 + x / 0b11;
int z = x++/++y;
out.println(z-- + x - y);
```

QUESTION 3

What is a possible output by the code to the right?

A. 13

B. 613

C. 97

D. 6241

E. 110100011

```
int x = 0x316;
String val = "";
while(x>0)
{
  val += x%8;
  x/=8;
}
out.println(val);
```

QUESTION 4

What is output by the code to the right?

A. WAALLLL-

B. WALL-E

C. WALALLLLL-L-E

D. WAALLLL--E

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

```
String x = "WALL-E";
String str ="";
for(int i=1; i<x.length()-1; i++)
  str+=x.substring(i-1,i+1);
out.println(str);
```

QUESTION 5

What is output by the code to the right?

A. WANNA, BUILD, A, SNOW, MAN,

B. MAN, BUILD, A, BUILD, MAN,

C. A, BUILD, A, WANNA, BUILD,

D. MAN, WANNA, MAN, SNOW, A,

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

```
String str[] = {"WANNA", "BUILD", "A",
                "SNOW", "MAN"};
for(String x:str)
{
  int i=x.charAt(x.length()/2);
  i=(i-'A')%str.length;
  str[i] = x;
}
for(String x:str)
  out.print(x + ", ");
```

QUESTION 6

What is output by the code to the right?

A. 700

B. 605

C. 55

D. 60

E. 30

```
int n = 20;
int m = n*3;
n *= m / 2 + n - 15;
out.println(n);
```

QUESTION 7

Which answer is logically equivalent to the following Boolean expression, where a, b, and c are boolean variables?

```
!(!c || a) && !(a && b && a || c)
```

A. `b || c` B. `true` C. `!a || !b` D. `c && (!a || !b)` E. `false`

QUESTION 8

What is output by the code to the right?

A. `[50, 6, 26, 27, 6, 40]`

B. `[6, 26, 1, 15, 6, 40]`

C. `[6, 26, 18, 1, 33, 7]`

D. `[50, 6, 26, -1, -15, -6]`

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

```
int list[]={50, 44, 18, 19, 34, 40};
for(int i=1; i<list.length; i++)
  if(list[i]>list[i-1])
     list[i]-=list[i-1];
  else
     list[i-1]-=list[i];
out.println(Arrays.toString(list));
```

QUESTION 9

What can replace `<*1>` in the code to the right such that the class is instantiated with the number of deeds set at 10?

A. `IceCold x.deed = 10;`

B. `IceCold x = new int[10];`

C. `IceCold x = 10;`

D. `IceCold x = new IceCold(10);`

E. `IceCold x = new IceCold[10];`

QUESTION 10

What is the output by the code to the right?

A. `0.000`

B. `1.000`

C. `0.577`

D. `4.654`

E. `0.462`

```
class IceCold
{
  private double heart;
  private int deed;
  private int max;

  public IceCold(int d)
  {
     heart = 1;
     deed = d;
     max = d;
  }

  public double getHeart()
  {
     return heart;
  }

  public void doDeed(int x)
  {
     max+=Math.abs(x);
     deed+=x;
     heart = (double)deed/max;
  }
}

////////////////////////////////////
///////////CLIENT CODE//////////////
<*1>
int[] deeds = {-1,-3,2,-3,6,1};
for(int d:deeds)
  x.doDeed(d);
out.printf("%.3f",x.getHeart());
```

QUESTION 11

What is output by the code to the right?

A. `5` B. `6` C. `8` D. `0` E. `12`

```
out.println(33&48>>2);
```

QUESTION 12

OPEN ENDED QUESTION – Fill in the blanks to the code below and write it on your answer sheet, or if using a ScanTron form, out to the side of the bubbles.

A piece of code is to calculate a random number from 4 to 8, inclusive. Complete the code

```
int num = (int)(Math.random()*____+_____);
```

QUESTION 13

What is output by the code to the right?

A. `$-  382.718,PRO`

B. `$382.718   ,PRO`

C. `$-382.718,PROGENY`

D. `$   382.718,PROGENY`

E. `$382.718   ,PROGENY`

```
double x = 382.717553;
String y = "PROGENY";
out.printf("$%-10.3f,%3s",x,y);
```

QUESTION 14

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

A. `100`

B. `10`

C. `50`

D. `40`

E. `70`

```
for(int i=0; i<10; i++)
  out.println("\n\n\n\n");
```

QUESTION 15

What is returned by the method call `h(140,360)`?

A. `2.571`

B. `1.167`

C. `0.127`

D. `0.857`

E. `7.826`

```
public static double h(int p, int r)
{
  if( p < 120 )
     p += 420;
  r /= 3;
  return (double)r / p;
}
```

QUESTION 16

What is the output by the code to the right?

A. `DAAYYAAIIS`

B. `NDTAWYRARI`

C. `ADYAAYIASI`

D. `DNATYWARIR`

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

```
String x = "DYNASTY WARRIORS";
String str = "";
for(int i=3; i<x.length(); i+=3)
{
  str+=x.charAt(i);
  str+=x.charAt(i-3);
}
out.println(str);
```

QUESTION 17

What is the output by the code to the right?

A. `62`

B. `69`

C. `61`

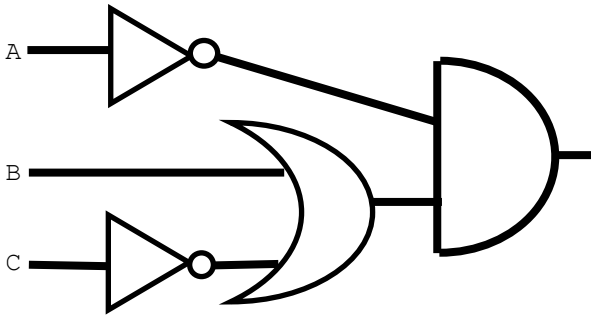
D. `59`

E. `79`

```
int[][] x = {{38,27,1},
  {40,21,39},{25,41,31}};
for(int r=0; r<3; r++)
  for(int c=0; c<3; c++)
     x[r][c]=100-x[r][c];
out.println(x[2][1]);
```

QUESTION 18

Which of the following logical statements is represented by the digital electronics diagram on the right ?



A. `(!A || B) && !C`

B. `A || !B && C`

C. `!A && (B || !C)`

D. `!A && B || !C`

E. `A && !B || C`

QUESTION 19

What is the output by the code to the right?

```
ArrayList<Integer> list;
list = new ArrayList<>();
int x[] = {38,5,29,12,46,39};
for(int i=0; i<x.length; i++)
  list.add(0,x[i]);
out.println(list);
```

A. `[39, 46, 12, 29, 5, 38]`

B. `[38, 5, 29, 12, 46, 39]`

C. `[39]`

D. `[38]`

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

QUESTION 20

What is output by the code to the right?

```
int x = 154;
int y = 31;
try
{
  out.print(x%y);
}
catch (Exception e)
{
  out.println("NAN");
}
finally
{
  out.print(x/y);
}
```

A. `304`

B. `NAN30`

C. `30NAN4`

D. `430`

E. There is no output due to a runtime error

QUESTION 21

What is output by the code to the right?

```
int x = 5;
do
{
  x+=10;
}while(x>7);
out.println(x);
```

A. `15`

B. `5`

C. `7`

D. `15`

E. `-2147483641`

QUESTION 22

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

A. `7`

B. `10`

C. `15`

D. `8`

E. There is no output due to a runtime error

QUESTION 23

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

A. `4`

B. `3`

C. `6`

D. `5`

E. There is no output due to a runtime error

```
public int[] wever(int[] x, int[] y)
{
  int len = x.length + y.length;
  int[] list = new int[len];
  for(int i=0; i<x.length; i++)
     list[i] = x[i];
  for(int i=0; i<y.length; i++)
     if(!vit(x,y[i]))
        list[i] = y[i];
  return list;
}


public boolean vit(int[] x, int t)
{
  for(int i:x)
     if(i==t)
        return true;
  return false;
}


////////////////////////////////////
//////////CLIENT CODE///////////////
int x[]={1,7,7,2,5,4,6};
int y[]={3,9,4,7,4,3,2,8};
int z[]=wever(x,y);
out.println(z.length);     //line 1
out.println(z[5]);         //line 2
```

QUESTION 24

What is wrong with the `Player` class in the code to the right?

A. `Player` should be an interface

B. The `Player` constructor needs a return type

C. `Player` must have an abstract method

D. `toString()` needs to call `super.toString()`

E. There is nothing wrong with the `Player` class.

QUESTION 25

What is wrong with the `BallPlayer` class in the code to the right?

A. The `BallPlayer` constructor needs to call `super(a,s);`

B. The `setPoints()` body should be `pts = pts * score;`

C. The `BallPlayer` constructor needs to call `super(a);`

D. the `setPoints()` body should be `setPoints(p*score);`

E. There is nothing wrong with the `BallPlayer` class.

QUESTION 26

What is wrong with the `QPlayer` class in the code to the right?

A. `QPlayer` should extend the `Player` class.

B. the `setPoints()` method should have an `int` return type.

C. `int[] score;` must be `int score;`

D. `QPlayer` should be an abstract class

E. There is nothing wrong with the `QPlayer` class.

```
abstract class Player
{
  private int abil;
  private int pts;
  public Player(int a)
  {
     abil = a;
     pts = 0;
  }
  public int getAbil(){return abil; }
  public void setAbil(int a)
  {  abil = a;}
  public int getPoints(){return pts;}
  public void setPoints(int p)
  {  pts=p;}
  public String toString()
  {  return abil+" "+pts; }
}

class BallPlayer extends Player
{
  private int score;
  public BallPlayer(int a, int s)
  {
     abil = a;
     pts = 0;
     score = s;
  }
  public void setPoints(int p)
  {  super.setPoints(p*score);      }

  public String toString()
  {
     return "BP "+super.toString();
  }
}

class QPlayer extends BallPlayer
{
  private int[] score;

  public QPlayer(int a, int[] s)
  {
     super(a);
     score = s;
  }

  public void setPoints(int i)
  {
     super.setPoints(getPoints()
          *score[i%score.length]);
  }

  public String toString()
  {
     return "QP "+super.toString();
  }
}
```

QUESTION 27

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

A. `5`

B. `10`

C. `4`

D. `15`

E. `9`

QUESTION 28

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

A. `[3, 3, 2, 8, 1, 5, 4]`

B. `[3, 3, 2, 8, 0, 4, 4]`

C. `[3, 3, 2, 7, 0, 4, 4]`

D. `[4, 3, 0, 7, 3, 0, 5]`

E. `[0, 0, 0, 0, 0, 0, 0]`

```
int[] lt = {5,3,2,8,3,7,5};
int count = 0;
int index = 0;
while(lt[index]!=0)
{
  count++;
  index+=lt[index]--;
  index%=lt.length;
}
out.println(count);      //line 1
String x = Arrays.toString(lt);
out.print( x );          //line 2
```

QUESTION 29

What is returned by the method call `mys(7)`?

A. `20` B. `32`

C. `7` D. `15`

E. `28`

QUESTION 30

What is returned by the method call `mys(mys(4))`?

A. `8` B. `20`

C. `35` D. `28`

E. `41`

```
public static int mys(int x)
{
  if(x<=0)
     return 1;
  return x+mys(x-3)+mys(x-4);
}
```

QUESTION 31

What would be the right most leaf on a binary search tree which had the following values placed into it: `46, 43, 49, 20, 47, 44, and 24`

A. `49`

B. `46`

C. `47`

D. `44`

E. `24`

QUESTION 32

What would be the left most leaf on a binary search tree which had the following values placed into it: `46, 43, 49, 20, 47, 44, and 24`

A. `49`

B. `46`

C. `47`

D. `44`

E. `24`

QUESTION 33

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

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

B. `[[2],[3],[5],[1]]`

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

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

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

QUESTION 34

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

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

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

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

D. `[3, 3, 2, 2, 2]`

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

QUESTION 35

How many edges would be on the resulting graph from the code to the right?

A. `5`

B. `4`

C. `10`

D. `20`

E. `6`

```
Map<Integer,TreeSet<Integer>> m;
m = new TreeMap<>();

m.put(1,new TreeSet<Integer>());
m.put(2,new TreeSet<Integer>());
m.put(3,new TreeSet<Integer>());
m.put(4,new TreeSet<Integer>());
m.put(5,new TreeSet<Integer>());
m.get(1).add(2);
m.get(2).add(3);
m.get(3).add(5);
m.get(5).add(1);
out.println(m.values());   //line 1

m.get(1).add(4);
m.get(4).add(2);
m.get(2).add(4);
out.println(m.keySet());   //line 2
```

QUESTION 36

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

A. `[13, 15, 3, 31, 33, 49]`

B. `[31, 3, 13, 33, 15, 49]`

C. `[3, 13, 15, 31, 15, 49]`

D. `[3, 13, 33, 31, 15, 49]`

E. `[3, 15, 33, 31, 13, 49]`

QUESTION 37

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

A. `[3, 13, 33, 15, 29, 49]`

B. `[13, 15, 29, 31, 49, 33]`

C. `[13, 15, 29, 31, 33, 49]`

D. `[15, 33, 31, 13, 49, 29]`

E. `[15, 29, 3, 31, 33, 49]`

```
PriorityQueue<Integer> pq;
pq = new PriorityQueue<Integer>();

int[] list = {3,15,33,31,13,49};

for(int x:list)
  pq.add(x);
out.println(pq);     //line 1

pq.remove();
pq.add(29);
out.println(pq);    //line 2
```

QUESTION 38

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

A. `7` B. `6` C. `4` D. `1` E. `8`

QUESTION 39

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

A. `be`

B. empty string

C. `e`

D. `a`

E. There is no output due to a runtime error

QUESTION 40

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

A. `1`

B. `3`

C. `5`

D. `2`

E. There is no output due to a runtime error

```
String x = "remember marc strong";
String[] list = x.split("[rm]");

out.println(list.length);   //line 1

out.println(list[3]);       //line 2

int count=0;
for(String st:list)
  if(st.matches(".*e.*"))
     count++;
out.println(count);         //line 3
```