Note: Correct responses are based on Java, J2sdk v 7.0, 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 127_{10} minus 17_{16} ?

A. 66_{16} B. 70_{16} C. 102_{10} D. 110_{10} E. 1101000_{2}

QUESTION 2

What is output by the code to the right?

A. 5f B. b C. 95 D. 1

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

```
int k = 0xbe;
k /= 0b10;
out.println(k);
```

QUESTION 3

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

A. 64

B. 50

C. 45

D. 32

E. The code creates an infinite loop.

```
int sum = 100;
for(int i=1; sum > 50; i+=5)
  sum-=2*i;
out.println(sum);
```

QUESTION 4

What is output by the code to the right?

A. -8

B. 4

C. 8

D. -4

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

```
String str1,str2;
str1="I LOVE PS4";
str2="I LOVE XBOX ONE";
out.println(str1.compareTo(str2));
```

QUESTION 5

What is output by the code to the right?

A. 5

B. 6

C. 8

D. 9

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

```
String key = "63934232211244";
String t = "83935214511234";
int c = 0;
boolean[] list = new boolean[10];
for(int i=0; i<list.length; i++)
  list[i]=key.charAt(i)==t.charAt(i);
for(boolean x:list)
  if(!x)
     c++;
out.println(c);
```

QUESTION 6

What is output by the code to the right?

A. 52 21

B. 28 21

C. 53 20

D. 28 20

E. 53 21

```
int n = 26;
int m = 21;
n = n++ % --m + (n++ + m++);
out.println(n+" "+m);
```

QUESTION 7

During a pass play, the opponent has the opportunity to steal the ball. The ball is considered stolen if both the pass and the receive are unsuccessful or if the steal is successful. Consider four Boolean variables called `pass`, `receive`, `steal`, and `stolen`. They will store the value true if their respective action is successful and false otherwise. Which of the following lines of code will correctly determine if the ball is stolen?

A. `stolen = !pass || !receive || steal;`

B. `stolen = steal && (!pass && !receive);`

C. `stolen = !steal && !(pass || receive);`

D. `stolen = steal || (!pass && !receive);`

E. `stolen = pass && receive && !steal;`

QUESTION 8

What is output by the code to the right?

A. `SFSFFSFF`

B. `FSSSFSS`

C. `FSFSSFSS`

D. `SFFFSFF`

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

```
int list[]={6,2,5,2,0,6,2,3};
for(int i=0; i<list.length; i++)
  if(list[i]>5)
     out.print("S");
  else if(list[i]<5)
     out.print("F");
out.println();
```

QUESTION 9

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

A. `3`

B. `0`

C. `2`

D. `-3`

E. `-2`

QUESTION 10

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

A. `0`

B. `12`

C. `2`

D. `7`

E. `5`

```
class SkillCheck
{
  private int skill;
  private int diff;
  public SkillCheck(int v, int k)
  {
     skill = v;
     diff = k;
  }

  public int numSuccess(int[] rolls)
  {
     int s = 0;
     for(int i=0;i<rolls.length;i++)
        if(rolls[i]>diff)
           s++;
     return s - skill;
  }

  public void altDif(int x)
  {
     diff += x;
  }
}

//////////CLIENT CODE/////////////
SkillCheck x = new SkillCheck(5,4);
int[] roll=
{1,3,1,3,6,1,4,1,6,2,2,1};
int s = x.numSuccess(roll);
out.println(s); <*1>
x.altDif(s);
out.println(x.numSuccess(roll)); <*2>
```

QUESTION 11

What is output by the code to the right?

A. `104` B. `52` C. `208` D. `0` E. `39`

```
out.println(13<<4>>1);
```

QUESTION 12

What is output by the code to the right?

A. `2 2.828`

B. `1 5`

C. `3 1.732`

D. `2 4`

E. `3 3.162`

```
int[] x = {5,3,4,1,1};
int avg = 0;
double s = 0;
for(int i:x)
  avg+=i;
avg/=x.length;
for(int i:x)
  s+=Math.pow(i-avg,2);
s = Math.sqrt(s/avg);
out.println(avg + " " + s);
```

QUESTION 13

What is output by the code to the right?

A. `Matt Schaub`
`Case`

B. `Matt Schaub\rCase`

C. `Case`

D. `Case Schaub`

E. More than one of these

```
out.print("Matt Schaub\rCase");
```

QUESTION 14

What is output by the code to the right?

A. `%x%b%d`

B. `a,true,22`

C. `a,100000,22`

D. `10,true,22`

E. `10,32,22`

```
int x = 10, b = 32, d = 22;
out.printf("%x,%b,%d",x,b,d);
```

QUESTION 15

What is returned by the method call `sec("Wormwood")`?

A. `doowmroW`

B. `dmooorwW`

C. `Wormwood`

D. `Wrwoomod`

E. `domoowrW`

```
public static String sec(String sen)
{
  int len=sen.length()/2;
  char[][] k = new char[2][len];
  int i = 0;
  String x="";
  for(int c=0; c<len; c++)
     for(int r=0; r<2; r++)
        k[r][c]=sen.charAt(i++);
  for(int r=0; r<2; r++)
     for(int c=0; c<len; c++)
           x+=k[r][c];
  return x;
}
```

QUESTION 16

What is the output by the code to the right?

A. `2460106010106010`

B. `246010460`

C. `24601024460`

D. `0106010`

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

```
String x = "246010";
x += x.substring(2,6);
x += x.substring(4,10);
out.println(x);
```

QUESTION 17

OPEN ENDED QUESTION – Find the the output of the code to the right and write it on your answer sheet, or if using a ScanTron form, out to the side of the bubbles.

```
int[][] x = {{10,3,25},
             {33,0,21},
             {48,46,11}};

for(int r=0; r<2; r++)
  for(int c=0; c<3; c++)
    x[1][1]+=x[r][c]-x[2-r][2-c];

out.println(x[1][1]);
```

QUESTION 18

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

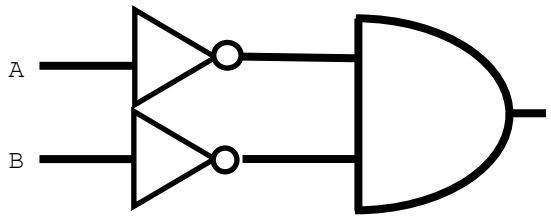
A. `A && B`

B. `!(A && B)`

C. `!A || !B`

D. `A || B`

E. `!A && !B`



QUESTION 19

What is the output by the code to the right?

A. `[Fire, Dynamo, Sporting]`

B. `[Union, Fire, Dynamo]`

C. `[Dynamo, Burn, Sporting]`

D. `[Revolution, Burn, Dynamo]`

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

```
ArrayList<String> fc;
fc = new ArrayList<>();
fc.add(0,"Burn");
fc.add(0,"Dynamo");
fc.add("Fire");
fc.add(1,"Crew");
fc.add(2,"Sounders");
fc.remove(4);
fc.set(2,"Revolution");
fc.remove(fc.size()/2);
fc.remove(fc.size()-2);
fc.add(0,"Union");
fc.set(3,"Sporting");
fc.remove(0);
out.println(fc);
```

QUESTION 20

What is output by the code to the right?

A. `[34, 33, 0, 33, 25, 0, 20, 50, 0]`

B. `[26, 20, 50]`

C. `[34, 33, 33, 25, 20, 50]`

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

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

```
int[] list = {4,3,0,3,4,0,5,2,0};
ArrayList<Integer> ray;
ray = new ArrayList<>();
for(int i=0; i<list.length; i++){
  try {
     ray.add(100/list[i]);
  }
  catch (Exception e) {
     ray.remove(0);
  }
  finally {
     ray.set(0,ray.get(0)+1);
  }
}
out.println(ray);
```

QUESTION 21

What is output by the code to the right?

A. `502113107`

B. `21131073`

C. `5`

D. `6`

E. `21131073-5`

```
int health = 25;
int[] end = {4,3,3,8};
int round = 0;
do
{
  health-=end[round];
  round = (round+3)%4;
  out.print(health);
}while (health>0);
```

QUESTION 22

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

A. `PS`

B. `FO`

C. `JO`

D. `BU`

E. `OD`

QUESTION 23

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

A. `FO`

B. `PS`

C. `BU`

D. `JO`

E. `OD`

```
public static String dec(String[] name,
                double[] num, int x)
{
  switch(x){
     case 1: num[1]+=.2;
             num[2]-=.2;
             return act(name,num);
     case 2: num[1]-=.1;
             num[2]-=.1;
             return act(name,num);
     case 3: num[1]-=.1;
             num[2]+=.3;
             return act(name,num);
     default: return name[3];
  }
}

public static String act(String[]
                  avat, double[] num)
{
  if(num[0]>=num[2])
     return avat[2];
  else if(num[0]>=num[1])
     return avat[1];
  else
     return avat[0];
}

//////////CLIENT CODE/////////////
double num[]={.3,.4,.7};
String pla[]={"FO","JO","OD","BU","PS"};
out.println(dec(pla, num, 3)); <*1>
num[0]=.5;
out.println(dec(pla, num, 1)); <*2>
```

QUESTION 24

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

	<*1A>	<*1B>
A.	instancof	instancof
B.	extends	implements
C.	implements	implements
D.	implements	extends
E.	extends	extends

QUESTION 25

Which line of code causes a syntax error in the client code at the right?

A. `work[1] = new Farca(50,30,10);`

B. `work[2] = new Shinot(100,100,100);`

C. `work[0] = new Dusta(100,20,50);`

D. `work[3] = work[0];`

E. There is no syntax error.

QUESTION 26

What is output by the code to the right? You may assume that syntax errors in the code have been corrected.

A. `Kyto 100:20:100`

B. `Kyto 150:100:10`

C. `Otak 100:20:100`

D. `150:100:10`

E. `Otak 150:100:10`

```
abstract class Shinot{
  private int[] stat;
  public Shinot(int e, int d, int a){
      stat = new int[3];stat[0] = e;
     stat[1] = d;      stat[2] = a;
  }
  public int getStat(int i)
  {return stat[i];}
  public void setStat(int i, int x)
  {stat[i] = x;}
  public abstract void work(int r);
  public String toString(){
      String temp="";
      for(int x:stat)temp+=x+":";
      return temp;
  }
}

class Farca <*1A> Shinot{
  public Farca(int e, int d, int a){
      super(e,0,a);
  }
  public void work(int r){
      if(getStat(0)<100)
      {
          int sut = getStat(1);
          sut+=getStat(2)*r;
          setStat(1,sut);
          setStat(0,sut+getStat(0));
      }
  }
  public String toString(){
      return "Kyto "+super.toString();
  }
}

class Dusta <*1B> Shinot{
  public Dusta(int e, int d, int a){
      super(e,d,100);
  }
  public void work(int r){
      if(getStat(0)>0)
      {
          int hin = getStat(2);
          hin-=r;
          setStat(0,getStat(1)-hin);
      }
  }
  public String toString(){
      return "Otak "+super.toString();
  }
}

////////////////////////////////////
//////////CLIENT CODE///////////////
Shinot[] work = new Shinot[5];
work[0] = new Dusta(100,20,50);
work[1] = new Farca(50,30,10);
work[2] = new Shinot(100,100,100);
work[3] = work[0];
work[4] = work[1];
work[4].work(10);
out.println(work[4]);
```

QUESTION 27

What is the value of list after running the code at right?

A. `[1, 9, 8, 7, 6, 5, 4, 3, 2, 10]`

B. `[1, 6, 2, 7, 3, 8, 4, 9, 5, 10]`

C. `[1, 2, 3, 4, 5, 6, 7, 8, 9, 10]`

D. `[6, 7, 8, 9, 10, 1, 2, 3, 4, 5]`

E. `[1, 8, 6, 4, 2, 9, 7, 5, 3, 10]`

QUESTION 28

OPEN ENDED QUESTION – write the answer on the answer sheet, or if using a ScanTron form, out to the side of the bubbles.

What is the smallest value of `c` that is greater than 0 which would cause the method `meh` to make no changes to the array which was passed in via the client code to the right?

```
public static void meh(int[]x, int c)
{
  int[] temp;
  while(c>0)
  {
     c--;
     temp = new int[x.length];
     int i = 0;
     int f = 0;
     int s = x.length/2;
     while(f<x.length/2&&s<x.length)
     {
        temp[i++]=x[f++];
        temp[i++]=x[s++];
     }
     if(f<x.length/2)
        temp[i]=x[f];
     else if(s<x.length)
        temp[i]=x[s];
     for(int k=0; k<x.length; k++)
        x[k]=temp[k];
  }
}

////////////////////////////////
//CLIENT CODE///////////////////
int[] list = {1,2,3,4,5,6,7,8,9,10};
meh(list,2);
```

QUESTION 29

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

A. `3` B. `19`

C. `7` D. `11`

E. `8`

QUESTION 30

What is returned by the method call `wham(wham(5))`?

A. `5` B. `-1`

C. `11` D. `4`

E. `7`

```
public static int wham(int count)
{
  if (count > 10 || count <0)
     return count;
  if(count%2==0)
     return count+wham(count+3);
  return count-wham(count-2);
}
```

QUESTION 31

A squad contains an unknown amount of members. Each member has one specific duty they are trained to do. Multiple members of the squad are trained in the same duty. Among the following choices, what is the best data structure to use to represent this squad in a program which would give a list of who in the squad could do a certain duty?

A. binary tree B. String C. Map D. Set E. array

QUESTION 32

What is the height of the binary search tree built from the following list using the following insert order: 43, 38, 44, 27, 19, 26, 36, and 8.

A. 7 B. 4 C. 8 D. 5 E. 3

QUESTION 33

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

A. `[Drew,Emmitt,Michael,Roger,Tony,Troy]`

B. `[Roger,Emmitt,Troy,Michael,Tony,Drew,Tony]`

C. `[Drew,Emmitt,Roger,Tony,Troy]`

D. `[Roger,Emmitt,Troy,Michael,Drew,Tony]`

E. `[Drew,Emmitt,Michael,Roger,Tony,Tony,Troy]`

QUESTION 34

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

A. `[88, 22, 12, 80, 8]`

B. `[88, 22, 12, 33, 8]`

C. `[8, 12, 22, 33, 80, 88]`

D. `[88, 22, 88, 12, 33, 8]`

E. `[8, 12, 22, 33, 88]`

QUESTION 35

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

A. `[2, 8, 12, 22, 23, 33, 80, 88]`

B. `[88, 12, 22, 2, 23, 12, 33, 8]`

C. `[2, 8, 12, 22, 23, 33, 88]`

D. `[2, 8, 12, 12, 22, 23, 33, 88]`

E. `[88, 12, 22, 2, 23, 33, 8]`

```
Map<String,Integer> map;
map = new TreeMap<>();
Map<String,Integer> map2;
map2 = new TreeMap<>();
Set<String> set = new TreeSet<>();

map.put("Roger",12);
map.put("Emmitt",22);
map.put("Troy",8);
map.put("Michael",88);
map.put("Tony",80);
map.put("Drew",88);
map.put("Tony",33);
out.println(map.keySet()); //line 1

out.println(map.values()); //line 2

map2.put("Johnny",2);
map2.put("Andre",88);
map2.put("Drew",12);
map2.put("Michael",23);
map.putAll(map2);
out.println(map.values());//line3
```

QUESTION 36

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

A. `[49, 26, 43, 23, 1, 30, 24, 10, 11]`

B. `[1, 10, 24, 23, 11, 49, 43, 30, 26]`

C. `[11, 30, 43, 10, 1, 49, 24, 23, 26]`

D. `[49, 43, 30, 26, 24, 23, 11, 10, 1]`

E. `[1, 10, 11, 23, 24, 26, 30, 43, 49]`

QUESTION 37

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

A. `[7, 16, 23, 26, 43, 49, 24, 30, 41]`

B. `[10, 1, 49, 24, 23, 26, 16, 7, 41]`

C. `[7, 16, 23, 24, 26, 30, 43, 41, 49]`

D. `[41, 26, 24, 23, 16, 11, 10, 7, 1]`

E. `[41, 26, 24, 23, 1, 11, 16, 10, 7]`

```
PriorityQueue<Integer> pq;
pq = new PriorityQueue<Integer>();
int[] lt={11,30,43,10,1,49,24,23,26};

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

pq.remove();
pq.remove();
pq.remove();
pq.add(16);
pq.add(7);
pq.add(41);
out.println(pq); //line 2
```

QUESTION 38

What is output by the code to the right?

A. `113`

B. `43`

C. `103`

D. `78`

E. `0`

```
System.out.println(113|43&101);
```

QUESTION 39

What string `s` would cause the code to the right to return true?

A. `Manarays`

B. `Mentors`

C. `Mustangs`

D. `Musings`

E. `Mavericks`

```
s.matches("M[^ae]+s");
```

QUESTION 40

What is output by the code to the right?

A. `[t, w, rh, mefe]`

B. `[timeywimeyrhymefey]`

C. `[]`

D. `[t, me, w, me, rh, me, fe]`

E. `[time, wime, ry, me, fe]`

```
String x = "timeywimeyrhymeyfey";
String[] list = x.split("[iy]");
out.print(Arrays.toString(list));
```