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 $476_8 + F0_{16}$?

A. 558_{10} B. 1056_8 C. $22E_{16}$ D. 1000101110_2 E. All are equivalent

QUESTION 2

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

A. `adacab` B. `ADACABA`

C. `197196195` D. `133132131`

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

QUESTION 3

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

A. `3534` B. `104103`

C. `51535152` D. `dfde`

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

```
public static String stuff(
                        char a,int x)
{
  char b = (char)x;String s = "";
  while (a<b)
     s+=a+b--;
  return s;
}

//line 1
out.println(stuff('a','d'));

//line 2
out.println(stuff(51,53));
```

QUESTION 4

What is output by the client code to the right?

A. `Eagle 7 4 -1 3`

B. `Innova Disc - Eagle 7 4 3 -1`

C. `Innova Disc - Eagle 13`

D. `Innova Disc - Eagle 7 4 -1 3`

E. `Disc@145a25f3`

QUESTION 5

If no toString method was defined, what would be the likely output for question 4 above?

A. `Disc`
B. `Eagle 13`
C. `Disc object`
D. `Disc@145a25f3`
E. There would be no output.

QUESTION 6

How many instance variables / fields does the Disc class have?

A. 1 B. 2 C. 3 D. 4 E. 5

```
class Disc
{
  int speed,glide,turn,fade;
  String type;

  Disc()
  {
     speed=7;glide=4;turn=-1;
     fade=3;type="Eagle";
  }
  Disc(int s,int g,int t,
       int f,String p){
     speed=s;glide=g;
     turn=t;fade=f;
     type=p;
  }
  public String toString()
  {
     return "Innova Disc - "+type+
     " "+speed+" "+glide+" "+fade+
     " "+turn;
  }
}

////////////////////////////////////
// client code ////////////////////
Disc d = new Disc();
out.println(d);
```

QUESTION 7

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.

```
boolean p=true,q=true;
p = !p;
q = !p;
out.println(p + "" +q);
```

QUESTION 8

What is output by the code to the right?

A. `42`

B. `14`

C. `48`

D. `28`

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

```
double g [][] = new double [4][];
for (int x = 2;x<6;x++)
  g[x-2]=new double[x];
String s = "";
for(int r=0;r<g.length;r++)
  for(int c=0;c<g[r].length;c++)
     s+=g[r][c];
out.println(s.length());
```

QUESTION 9

What is output by the code to the right?

A. `4897659050` B. `0Aaz2`

C. `a0AZc` D. `0aAZ2`

E. `A0azC`

```
char[] list = {48,97,65,90,50};
String s = "";
for(char a:list)
  s+=a;
out.println(s);
```

QUESTION 10

What is output by the code to the right?

A. `100 33` B. `d 22`

C. `d 33` D. `68 22`

E. `33 100`

```
char a = 'd';
int x = 3;
out.println(a+" "+a/3);
```

QUESTION 11

What is output by the code to the right?

A. `-9-29` B. `-29`

C. `-11` D. `-9-11`

E. There is no output.

```
int b = -9;
if(b < -20)
  out.print(b);
  out.print(-20 - b);
```

QUESTION 12

What is the last line of output by the code to the right?

A. `6 1` B. `5 1`

C. `7 0` D. `6 0`

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

```
for(int i=0,j=100;j>0;)
  out.println(i++ +" "+ (j/=2)+" ");
```

QUESTION 13

What is output by the code to the right?

A. `22.4 25.6` B. `44.8 25.6`

C. `96.0 51.2` D. `19.2 12.8`

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

```
double d = 0.0,e=3.2;
while(e<20)
  d+=e*=2;
out.printf("%.1f %.1f\n",d,e);
```

QUESTION 14

What is output by the code to the right?

A. `true` B. `false`

C. `0` D. `1`

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

```
String s = "arpeggio";
String t = "arp";
out.println(s.beginsWith(t));
```

QUESTION 15

What is output by the code to the right?

A. `3` B. `3.0`

C. `4` D. `4.0`

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

```
out.println(Math.rint(3.14));
```

QUESTION 16

What is output by the code to the right?

A. `1` B. `2` C. `6`

D. `7` E. `44`

```
byte a=9,b=14,c=26,d=2;
out.println(a^b|c&d);
```

QUESTION 17

What is output by the code to the right?

A. `10` B. `11.5`

C. `13` D. `19.5`

E. `21`

```
out.println(4 + 2.5 * 3);
```

QUESTION 18

What is output by the code to the right?

A. `14 + 14.6 = 28.6`

B. `14 + 15.0 = 29.0`

C. `15 + 14.6 = 29.6`

D. `15 + 15.0 = 30.0`

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

```
double d = 14.6;
Integer x = (int)d;
out.println(x+" + "+d+" = "+(x+d));
```

QUESTION 19

Find f(6) according to the recursive function definition shown on the right. You may use the space below to do your work.

f(6) =

A. -1

B. 14

C. 15

D. 19

E. 20

$$f(x) = \begin{cases} f(x-1)+x & \text{when } x>1 \\ x-2 & \text{when } x=1 \end{cases}$$

QUESTION 20

What is output by the code to the right?

A. `1111111` **(7 1s)**

B. `111111111111111` **(15 1s)**

C. `11111111` **(8 1s)**

D. `1111111111111111` **(16 1s)**

E. `11111111111111111111111111111111` **(31 1s)**

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

QUESTION 21

What is output by the code to the right?

A. 4 B. 8 C. 16

D. 32 E. 64

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

QUESTION 22

What is output by the code to the right?

A. 1 B. 21 C. 22

D. 31 E. 32

```
int i = -1>>>10;
String s = Integer.toBinaryString(i);
out.println(s.length());
```

QUESTION 23

What is output by the code to the right?

A. 000 011 101 111

B. 000 010 100 111

C. 000 011 101 110

D. 001 010 100 111

E. 001 010 100 110

```
for(int p = 0; p <= 1; p++)
  for(int q = 0;q <= 1; q++)
     out.print(""+p+q+(p^q)+" ");
```

QUESTION 24

What is output by the code to the right?

A. 1.0 B. 0x1.0 C. 0x1.00

D. 0x1.000000 E. 0x1.0p0

```
double d = 1.0;
String s = Double.toHexString(d);
out.println(s);
```

QUESTION 25

What is output by the code to the right?

A. 2.07 B. 18.84 C. 3.09

D. 28.26

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

```
char a = 'A';
int b = 10;
double c = 3.14;
out.println(a/b*c);
```

QUESTION 26

What is output by the code to the right?

A. 0 1 B. 0 6 C. 14 1

D. 14 6 E. 14 20

```
int a = 14,b = 20;
out.println(a%b+" "+b%a);
```

QUESTION 27

For which pair of ordered input values below will the output of the code on the right be zero?

A. 6 6

B. 4 5

C. -2 2

D. 5 4

E. more than one of these

```
int x = <input 1>;
int y = <input 2>;

int z = (x+y%3==0)?x+y:x-y;
out.println(z);
```

QUESTION 28

After repeating the sequence - <push a value>, <push a value>, <pop a value> - on a normal stack with the list of values on the right, what is the value left at the top of the stack?

A. 1 B. 3 C. 6 D. 8 E. 9

2 5 7 3 1 6 8 9

QUESTION 29

`Class E` on the right is an example of using what OOP technique?

A. abstract class B. inheritance
C. interface D. overloading
E. polymorphism

QUESTION 30

Which term best describes `B()` in `class A` on the right?

A. accessor B. constructor
C. modifier D. mutator
E. overloader

QUESTION 31

What is output for `//client code part 1` in the code to the right?

A. `10 9` B. `10 10 0` C. `0 0 0`
D. `10 10` E. `10 9 0`

QUESTION 32

What is output for `//client code part 2` in the code to the right?

A. `0 0 0` B. `12 1 0` C. `0 0 0`
D. `1 12 4` E. `12 1 4`

QUESTION 33

What is output for `//client code part 3` in the code to the right?

A. `8 0` B. `8 8`
C. `4 4` D. `12 4 12 4`
E. There is no output due to a compile error.

```
class A
{
     int x;
     A()       {x=10;}
     A(int y)  {x=y;}
     int B()   {return this.x;}
     public String toString()
               {return ""+x;}
}

class E extends A
{
     int x;
     E()       {super(9);}
     E(int z)  {x=z;}
     int B()   {return x+this.x;}
     void C(int d)
               {x=d;;super.x=d*3;}
     public String toString()
         {return super.x+" "+x;}
}

////////////////////////////////////
//client code part 1
A a = new A();
E b = new E();
out.println(a+" "+b);


////////////////////////////////////
//client code part 2
a= new A(1);
b.C(4);
out.println(a+" "+b);


////////////////////////////////////
//client code part 3
a=b;
out.println(a.B()+" "+b.B());
```

QUESTION 34

After repeating the sequence - <push a value>, <push a value>, <pop a value> - on a normal **queue** with the list of values on the right, what was the last value popped from the queue?

A. 1 B. 3 C. 6 D. 8 E. 9

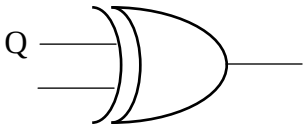
2 5 7 3 1 6 8 9

QUESTION 35

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

A. P AND Q B. P OR Q C. P XOR Q

D. P NAND Q E. P NOR Q



QUESTION 36

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

A. `[r, b, j, z]` B. `[r, b, c, z]`

C. `[a, b, c, d]` D. `[a, e, c, d]`

E. `[a, e, j, d]`

QUESTION 37

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

A. `[r, b, j, z]` B. `[r, b, c, z]`

C. `[a, b, c, d]` D. `[a, e, c, d]`

E. `[a, e, j, d]`

QUESTION 38

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

A. `[r, b, j, z]` B. `[r, b, c, z]`

C. `[a, b, c, d]` D. `[a, e, c, d]`

E. `[a, e, j, d]`

```
Map<Integer,String> a;
a = new TreeMap<Integer,String>();

Map<Integer,String> b;
b = new TreeMap<Integer,String>();

Map<Integer,String> c;
c = new TreeMap<Integer,String>();

a.put(1,"a");
a.put(2,"b");
a.put(3,"c");
a.put(4,"d");


//line 1
out.println(a.values());
b.putAll(a);
b.put(1,"r");
b.put(4,"z");
b.put(3,"j");



//line 2
out.println(b.values());
c.putAll(b);
a.remove(3);
c.putAll(a);
c.put(2,"e");


//line 3
out.println(c.values());
```

QUESTION 39

What is output by the code to the right?

A. 2
B. 7
C. 9
D. 11
E. 13

```
int j = 0;

String [][] grid =
  {{"racecar","adam","madam"},
   {"time","fife","lull","good"},
   {"sheep","pen","abracadabra"},
   {"rare","grunge","cosmic"}};

for(String [] g:grid)
  for(String s:g)
  {
     int k=0;
     for (char a:s.toCharArray())
        if(s.charAt(0)==a)
           k++;
        j=k>1?j+1:j;
  }
out.println(j);
```

QUESTION 40

*OPEN ENDED QUESTION – Find the **two** answers and write them on your answer sheet **correctly labeled**, or if using a ScanTron form, out to the side of the bubbles, also **correctly labeled**.*

If not labeled, the order you put your answers will be assumed to be the order indicated below.

Using a **priority queue** and the commands **push** to insert a value in natural order, and **pop** to remove an item from the front of the queue, repeat the sequence **push 5 values, pop 2 values** on the list of characters on the right and indicate the last value popped and the next value to be popped.

Last value popped	Next value to be popped
	P

COMPUTERSCIENCE