Note: Correct responses are based on Java, **J2sdk v 1.8.x**, 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 101111_2 plus 101000_2 ?

A. 110111_2 B. 1011111_2 C. $A7_{16}$ D. 59_{16} E. 87_{10}

QUESTION 2

What is output by the code to the right?

A. 32 B. 1.125 C. 31.942

D. 49 E. error – type mismatch

```
int x = 34, y = 2;
int z = x + y / x - y;
out.println(z);
```

QUESTION 3

What is output by the code to the right?

A. MAYDAYMAYDAYMAYDAY

B. MAYDAY MAYDAYMAYDAY

C. MAYDAYs s

D. MAYDAYMAYDAY s

E. MAYDAY MAYDAYs

```
String k = "MAYDAY";
out.printf("MAYDAY%-10ss",k);
```

QUESTION 4

What is output by the code to the right?

A. 4536

B. 24536

C. 245

D. 453

E. 2453

```
String x = "1245365154896";
x = x.substring(2,5);
out.println(x);
```

QUESTION 5

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

A. a = false; b = true; c = false;

B. a = true; b = true; c = true;

C. a = false; b = false; c = false;

D. a = false; b = false; c = true;

E. a = true; b = false; c = false;

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

QUESTION 6

What is output by the code to the right?

A. -3

B. -2.435

C. -3.0

D. -2.0

E. -2

```
out.println(Math.ceil(-2.535));
```

QUESTION 7

What is output by the code to the right?

A. `0 2 2`

B. `111 3 0`

C. `0 3 3`

D. `74 2 0`

E. `37 1 0`

```
int x = 37;
int y = x/12;
int z = y%6;;
x = x*(y-z);
out.println(x+" "+y+" "+z);
```

QUESTION 8

What is output by the code to the right?

A. `2`

B. `1`

C. `5`

D. `4`

E. `3`

```
int x = 332;
switch(x%5){
      case 0: x%=6; break;
      case 1: x%=2; break;
      case 2: x%=5; break;
      case 3: x%=4; break;
      case 4: x%=3; break;
}
out.println(x);
```

QUESTION 9

What is output by the code to the right?

A. `326`

B. `158`

C. `165`

D. `0`

E. `163`

```
int x = 326;
for (int i=0; i<x; i+=7)
   x-=7;
out.println(x);
```

QUESTION 10

What is output by the code to the right?

A. `-15`

B. `10`

C. `14`

D. `11`

E. index out of bounds exception

```
int[] x = {26,38,35,23,45,37};
int y = x[3]-x[1];
out.println(y);
```

QUESTION 11

Which of the following correctly replaces **<*1>** in the code to the right such that the file will be correctly read and outputted?

A. `input.hasNextLine()`

B. `input.hasNextInt()`

C. `input.hasNext()`

D. `input.hasNextDouble()`

E. all of the above

```
Scanner input =
   new Scanner(new File("file.txt"));
int age, level;
String name;
while(  <*1>  )
{
  age = input.nextInt();
  level = input.nextInt();
  name = input.nextLine();
  out.println(age+"\n"+level+"\n"+
              name);
}

//FILE TO BE READ
26 13 Houston
2 14 Dallas Fort Worth
36 -8 San Antonio
1 4 Lubbock
```

QUESTION 12

What is output by the code to the right?

A. 0

B. 5

C. 2

D. 20

E. no output due to an infinite loop

```
int x = 0;
for (double i=34; i<39; i+=1/4)
      x++;
out.println(x);
```

QUESTION 13

Which of the following has the highest order of precedence?

A. * B. casting C. != D. << E. +

QUESTION 14

What is output by the code to the right?

A. -6

B. -5

C. 4

D. -4

E. 6

```
int x = 5;
out.println(~x);
```

QUESTION 15

What is output by the code to the right?

A. [ALL, EVERY, TIME, DAY, STUDY]

B. [ALL, STUDY, EVERY, DAY, TIME]

C. [STUDY, ALL, DAY, EVERY, TIME]

D. [ALL, EVERY, TIME]

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

```
ArrayList<String> list;
list = new ArrayList<String>();
list.add(0,"STUDY");
list.add(0,"ALL");
list.add(1,"DAY");
list.add(1,"EVERY");
list.add(2,"TIME");
out.println(list);
```

QUESTION 16

What are the three most important properties of object orientated programming?

A. encapsulation, instantiation, modification

B. inheritance, polymorphism, abstraction

C. encapsulation, inheritance, polymorphism

D. modification, inheritance, instantiation

E. implementation, extension, encapsulation

QUESTION 17

What could best fill in **<*1>** such that the code to the right will output 41?

A. `this.chargeBattery(x/3);`

B. `super(x+x/3);`

C. `chargeBattery(x/3);`

D. `charge+=x/3;`

E. `super.chargeBattery(x/3);`

```
class Battery
{
  private int charge;
  public Battery(int x)
  {     charge = x;                 }
  public void chargeBattery(int y)
  {     charge+=y;                  }
  public int getBattery()
  {     return charge;              }
}

class Solar extends Battery
{
  public Solar(int x)
  {     super(x);                   }
  public void chargeBattery(int x)
  {     <*1>                        }
}

////////////////////////////////////
//CLIENT CODE  ////////////////////
Solar bat = new Solar(25);
bat.chargeBattery(50);
out.println(bat.getBattery());
```

QUESTION 18

What is output by the code on the right if list holds the following numbers: {1,5,1,5,1,1,1,5,1,6,2,1,1,1,4,5,1,5}?

A. [1,5,1,5,1,1,1,5,1,6,2,1,1,1,4,5,1,5]

B. [6]

C. [5,5,5,6,5,5]

D. [5,5,1,5,6,1,1,5,5]

E. There is no output due to a runtime error

```
ArrayList <Integer> list;
list = new ArrayList<>();
for(int k=0; k<list.size(); k++)
      if(list.get(k)<5)
            list.remove(k);
out.println(list);
```

QUESTION 19

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

A. 13

B. -7

C. -1

D. 12

E. 8

```
int a,b;
a = /* value not shown */;
b = 13;
int x = a%b-6;
out.println(x);
```

QUESTION 20

What is output by the code to the right?

A. 1 0 6 2 4 0

B. 2 1 6 2 4 0

C. 2 0 6 2 4 0

D. 1 0 5 1 3 0

E. 1 1 5 1 3 0

```
int[] x = {4,2,8,4,6,2};
int y = 0;
while(x[y]>0){
      x[y]-=1;
      y++;
      y%=x.length;
}
for(int k:x)
      out.print(k+" ");
out.println();
```

QUESTION 21

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

A. 7

B. 8

C. 3

D. 5

E. 4

QUESTION 22

How many unique numbers are printed by line <*2> in the code on the right?

A. 11

B. 100

C. 7

D. 10

E. 8

```
public static int mys(int x)
{
	int n;
	if(x<=5)
		x-=3;
	else
	{
		n = --x/10;
		if(n<5)
			x = n + 3;
		else
			x = 7;
	}
	return x;
}

////////////////////////////////////
// CLIENT CODE  ////////////////////
out.println(mys(17));<*1>
for(int i=0; i<=100; i++)
   out.print(mys(i)+" ");<*2>
```

QUESTION 23

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

A. 30

B. 5

C. 31

D. 26

E. 0

```
out.println(26|31&30|5);
```

QUESTION 24

What is the boolean expression for the truth table to the right?

A. A&&B

B. !(A&&B)

C. A||B

D. !(A||B)

E. !A||!B

A	B	???
T	T	F
T	F	F
F	T	F
F	F	T

QUESTION 25

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

A. RSNCRUIHK?SAAE?

B. RCNSRKHIUEAAS?

C. RUSKSIAERNHAR?

D. RUSSIANHACKER

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

QUESTION 26

What could replace **<*2>** in the code on the right so that the code after **<*3>** prints IAOH? ?

A. LIESAREBOUNDTOBE

B. WITHAROOKTHING

C. ISINCANTONOHIO

D. SPINTHEOLDHATS

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

```
public static char[][] mys2(String x)
{
  int num = x.length()/3;
  char[][] k = new char[3][num+1];
  int i=0;
  for(int c = 0; c<k[0].length; c++)
     for(int r=0; r<k.length; r++)
        if(i<x.length())
           k[r][c]=x.charAt(i++);
        else
           k[r][c]='?';
  return k;
}

////////////////////////////////////
//CLIENT CODE  ////////////////////
char[][]mat = mys2("RUSSIANHACKER");
for(char[] x:mat)
  for(char y:x)
     out.print(y);
out.println();   <*1>

mat = mys2(  <*2>  );
<*3>
for(char y : mat[2])
   out.print(y);
out.println();
```

QUESTION 27

What is returned by the method call mys3(0)?

A. 10

B. 28

C. 25

D. 31

E. There is no output due to an infinite loop

QUESTION 28

What is returned by the method call mys3(-mys3(-2))?

A. 28

B. 103

C. 130

D. 10

E. There is no output due to an infinite loop

```
public static int mys3(int x)
{
  if (x>5)
     return 10;
  return 3 + mys3(x+1);
}
```

QUESTION 29

What is the binary value of the hexadecimal number AC7?

A. 1010010110 B. 10011101111 C. 1011111 D. 101111100001 E. 101011000111

QUESTION 30

What is the height of the binary search tree created on the right?

A. 6 B. 2 C. 4 D. 3 E. 5

QUESTION 31

What is the level of the value 32 in the binary search tree created on the right?

A. 3 B. 0 C. 1 D. 4 E. 2

QUESTION 32

What would the post order printing of the binary search tree look like?

A. 2 13 17 32 34 46

B. 17 2 46 13 34 32

C. 17 2 13 46 34 46

D. 17 46 34 32 2 13

E. 13 2 32 34 46 17

Put the following values into a binary search tree from left to right order

17 46 34 32 2 13

QUESTION 33

What is output by the code on the right?

A. [1, 15, 7, 48, 4, 5, 42]

B. [15, 7, 48, 4, 1, 5, 42]

C. [1, 4, 5, 15, 7, 48, 42]

D. [1, 4, 5, 7, 15, 42, 48]

E. you cannot predict the order

```
int[] list = {15,7,48,4,1,5,42};
PriorityQueue<Integer> x;
x = new PriorityQueue<>();
for(int k:list)
  x.add(k);
out.println(x);
```

QUESTION 34

What is output by the code on the right?

A. 3271

B. 961

C. 29192

D. 409

E. 1124

```
out.println(3274>>3);
```

QUESTION 35

How many empty Strings are contained in list after the code on the right is completed?

A. 4

B. 3

C. 0

D. 1

E. 2

```
String x = "IWANNABEALIFETIMEFRIEND";
String[] list = x.split("[NI]");
```

QUESTION 36

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

Simplify the Boolean algebra statement on the right

A. `A+BC`

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

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

D. `!A!B!C`

E. `1`

QUESTION 37

What is the name of the logic symbol to the right?

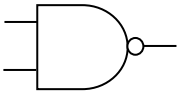
A. `AND`

B. `NAND`

C. `XOR`

D. `NOR`

E. `OR`



QUESTION 38

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

A. `A+B^C/.5^.5*1-D^E/2`

B. `(A+B)^(C/.5)*(.5)*(1-D)^E/2`

C. `A*(B+C)^.5/(2/(1-D)^E^.5`

D. `(A/(B+C)^.5)^.5*1/(D-E)^2`

E. `(A+B^.5*C)/(1-D/2*E)^.5`

`A B C + .5 ^ / .5 ^ 1 D E - 2 ^ / *`

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 does the signed byte data type look like when storing the decimal value to the right?

bit	bit	bit	bit	bit	bit	bit	bit

-39_{10}

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.

What is a possible value for x which makes this equation true?

`NOT(RCIRC-4(011101)XOR LSHIFT-2(x))=110110`