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 $11010001_2 - 42_{10}$?

A. 167_{10} B. 247_8 C. $A7_{16}$ D. 10100111_2 E. All are equivalent

QUESTION 2

What is output by the code segment to the right?

A. 0 B. 0.55 C. 4 D. 24

E. undefined - mod by zero error

```
out.println(24 * 1 % 2 / 3);
```

QUESTION 3

What is the output of the code segment to the right?

A. 1000 B. 952 C. 9502 D. 948

E. There is no output due to an error

```
out.println(1000 - 50 + "2");
```

QUESTION 4

What is output by the code segment to the right?

A. true B. false C. There is no output due to an error

```
String s = "jazzyjazzygirl";
String t = "jazmine";
out.println(s.startsWith
            (t.substring(1,3),6));
```

QUESTION 5

What is output by the code segment to the right?

A. false B. true

```
p = false;
q = false;
out.println(!(p&&q));
```

QUESTION 6

What is output by the code segment to the right?

A. 47 B. -47.9 C. 47.9 D. 48 E. 47.0

```
double d = 47.9;
out.println(Math.abs(d));
```

QUESTION 7

What is output by the code segment to the right?

A. 3 B. 3.0 C. 3f D. 3.0f

E. There is no output due to an error.

```
float f = 1.0;
int x = 2;
out.println(f+x);
```

QUESTION 8

For which of these input values will the output of the code segment to the right be "blue"?

I -30
II -40
III -14
IV -16
V -39

A. I only B. II only C. II and III only

D. I, IV, and V only E. III and V only

```
int x = <input value>;
if(!(x<-15&&x>-40))
 out.println("red");
else
  out.println("blue");
```

QUESTION 9

What is output by the code segment to the right?

A. `UILComputerSci ence2015`

B. `UILComputerSc ence2015`

C. `UILComputerSc ience2015`

D. Nothing is output

E. There is no output due to an error

```
String s = "UILComputerScience2015";
String t = "";
while(!t.contains("i"))
{
 t+=s.charAt(0);
 s=s.substring(1);
}
out.println(t+" "+s);
```

QUESTION 10

What is output by the code segment to the right?

A. `12345`

B. `1.02.03.04.05.0`

C. `1.0000002.0000003.0000004.0000005.000000`

D. `15`

E. There is no output due to an error

```
double [] list = {1,2,3,4,5};
for(double d:list)
  out.print(d);
```

QUESTION 11

In the code segment to the right, which statement below must be placed in **<code block>** in order for this code to work properly?

A. `import java.io.*;`
B. `import java.util.*;`
C. `import static java.lang.System.*;`
D. `import static java.lang.Math.*;`
E. More than one of these.

```
<code block>
public class test{
 public static void main
           (String [] args)
               throws IOException{
   Scanner f = new Scanner
           (new File("stuff.dat"));
 }
}
```

QUESTION 12

What is output by the code segment to the right?

A. `31 28 6` B. `31 28 7` C. `31 29 6` D. `30 30 7`

E. None of these

```
int x = 10;
int y = 50;
int z = 1;
for(;x<=y;z++){
 x+=z;
 y-=z;
}
out.println(x+" "+y+" "+z);
```

QUESTION 13

Here are three lines taken from the Java Order of Precedence chart. Which choice represents the correct order of precedence for these three lines?

A. I, II, III B. III, II, I C. II, I, III

D. I, III, II E. III, I, II

I. `&`
II. `|`
III. `+ -`

QUESTION 14

What is output by the code segment to the right?

A. `8` B. `16` C. `32` D. `64` E. None of these

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

QUESTION 15

What is output by the code segment to the right?

A. `14 9` B. `9 14` C. `15 10` D. `10 15`
E. There is no output due to an error.

```
int [] pList =
 {1,2,3,1,2,3,1,2,3,1,2,3,1,2,3,2,3};
ArrayList<Integer> aList = new
    ArrayList<Integer>();
for(int a:pList)
    aList.add(a);
out.print(aList.lastIndexOf(2)+" ");
Collections.sort(aList);
out.println(aList.lastIndexOf(2));
```

QUESTION 16

What is the output after the second iteration during the execution of the code segment to the right using the client code shown below?

```
int [] list = {8,2,4,7,6};
mystD2(list);
```

A. 2 4 8 7 6 B. 2 4 6 7 8 C. 8 2 4 7 6

D. 8 7 4 2 6 E. 2 8 4 7 6

```
1 public static void mystD2(int[] list)
2 {
3   for (int x = 0; x < list.length - 1;
              x++){
4    int b = x;
5    for (int y = x+1; y < list.length;
              y++)
6      if (list[y] < list[b])
7        b = y;
8    int a = list[x];
9    list[x]=list[b];
10   list[b]=a;
11   for(int i:list) out.print(i+" ");
12      out.println();
   }
}
```

QUESTION 17

What algorithm is represented by the method `mystD2`?

A. Insertion sort B. Selection sort C. Bubble sort

D. Merge sort E. Quick sort

QUESTION 18

In which line of `mystD2` must a change be made so that the sorting order is reversed?

A. Line 3 B. Line 5 C. Line 6

D. Line 8 E. Line 10

QUESTION 19

What is the least restrictive order of magnitude for the average case in the sort shown in the code to the right?

A. O(N) B. O(N^2) C. O(log N) D. O(N log N) E. O(1)

QUESTION 20

Which of the following choices represents the decimal equivalent of the two's complement binary value 11011100?

A. -36 B. -37 C. -38 D. -39 E. -40

QUESTION 21

How many ordered pairs make this boolean expression false?

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

$$\overline{\bar{A} * \bar{B}}$$

QUESTION 22

What is the postorder traversal of the binary tree shown to the right?

A. `COPSMCI` B. `PSOCIMC` C. `POSCCMI`

D. `COMPSCI` E. `ICMSPOC`

QUESTION 23

What is output by the code segment to the right?

A. `4` B. `4.0` C. `-4` D. `-4.0`

E. There is no output due to an error.

```
double d = 9.5;
int i = 14;
int j = 0;
j += d -= i;
out.printf("%d",j);
```

QUESTION 24

Using the generic queue pseudocode on the right, what is the sum of all popped items after the push (enqueue) and pop (dequeue) sequence is complete?

A. 14 B. 17 C. 18 D. 22 E. 25

```
Push 3
Push 9
Push 6
Push 4
Pop x
Pop x
Push 5
Pop x
Push 2
Pop x
```

QUESTION 25

What is the output of the code segment to the right?

A. 54 10 B. 54 12 C. 54 13 D. 66 10 E. 66 13

```
int s=0,t=0;
while(s<50){
 t=10;
 do{
    s+=t++;
 }while(t<=12);
}
out.println(s+" "+t);
```

QUESTION 26

In the Weather class definition to the right, how many constructors are there?

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

QUESTION 27

Using the Weather class definition to the right, with the block comment symbols in place as shown, what is the output of the client code below?

```
Weather d = new Weather();
out.println(d);
```

A. rain: 65 degrees: wet

B. Weather@4a5ab2

C. rain: 65: dry

D. :0 : false

E. null: 0: false

QUESTION 28

If the block comment symbols are removed in the Weather class definition to the right, what is the output of the client code below?

```
Weather d = new Weather("fair",74,false);
out.println(d);
```

A. Weather@4a5ab2
B. fair: 74: dry
C. fair: 74 degrees: dry
D. fair: 74 degrees: wet
E. There is no output due to an error

```
class Weather{
 private String type;
 private int temperature;
 private boolean wet;

 public Weather(){
    type = "rain";
    temperature = 65;
    wet = true;
 }
 public Weather(String ty, int te,
                boolean wt){
    type = ty;
    temperature = te;
    wet = wt;
 }
/*
 public String toString(){
    return type+": "+temperature+"
           degrees: " +
                (wet?"wet":"dry");
*/
 }
}
```

QUESTION 29

Which of the following values is **NOT** a possible outcome of the code shown to the right?

A. 25 B. 27 C. 29 D. 31 E. 33

```
Random r = new Random();
out.print(r.nextInt(8)+26);
```

QUESTION 30

What is output by the code segment below?

```
char[][]list={"freshman".toCharArray(),"sophomore".toCharArray(),
              "junior".toCharArray(),"senior".toCharArray()};
int x = 0;
for(char[]a:list)
 for(char b:a)
  x+=b=='o'?1:0;
out.println(x);
```

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

QUESTION 31

Which of the expressions below is equivalent to the expression shown to the right?

A. **M * A ^ R * T / I - N**
B. **M * A ^ R * T - I / N**
C. **M ^ A * R * T / I - N**
D. **M * A * R ^ T / I - N**
E. None of these

- / * * M ^ A R T I N

QUESTION 32

What is output by the code segment to the right?

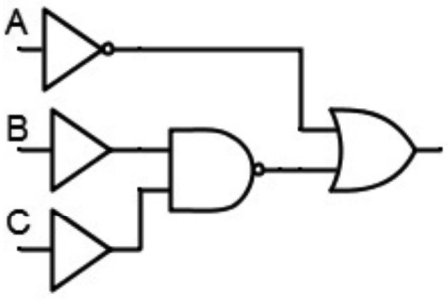
A. 30.0 B. 45.0 C. 60.0 D. 90.0 E. None of these

```
double val = 0.5;
out.printf("%.1f\n",Math.toDegrees
            (Math.asin(val)));
```

QUESTION 33

Which of the following logical statements represents the diagram on the right?

A. $A + B * C$
B. $\bar{A} * \overline{B + C}$
C. $\bar{A} + B * C$
D. $A + \overline{B * C}$
E. None of these



QUESTION 34

Which of the choices below correctly fills <statement> in the code segment to the right in order to produce the output shown below?

[0, 0, 5, 5, 5, 5, 5, 0, 0, 0]

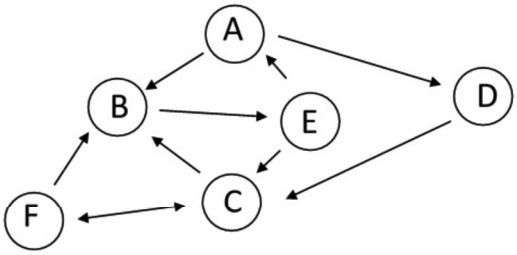
A. `Arrays.fill(list, 2, 6, 5);`
B. `Arrays.fill(list, 2, 7, 5);`
C. `Arrays.fill(list, 5, 7, 2);`
D. `Arrays.fill(list, 5, 6, 2);`
E. None of these

```
int [] list = new int [10];
<statement>
out.println(Arrays.toString(list));
```

QUESTION 35

In the graph shown to the right, how many different cycles are there?

A. 0 B. 2 C. 4 D. 6 E. more than 6



QUESTION 36

Which choice below represents the term listed to correctly replace `<term>` in the method to the right?

A. `public` B. `static` C. `void`
D. `int` E. `return`

QUESTION 37

Assuming `<term>` has been correctly replaced, what values are output by the client code to the right?

A. `10 50 16 16` B. `10 10 16 80`
C. `10 10 16 16` D. `50 50 80 80`
E. None of these

```
static <term> mystD2 (int x){
 int y=0;
 if(x%5==1)
    y = x*5;
 else
    y = x;
 out.println(x+" "+y);
}

<client code>
mystD2(10);
mystD2(16);
```

QUESTION 38

What is output by the code to the right?

A. `112` B. `88` C. `5` D. `5.5`
E. There is no output due to an error

```
out.println(Integer.toString(22,4));
```

QUESTION 39

Free Response Question: Simplify the Boolean Algebra expression shown below as much as possible.

$$\overline{(A + \bar{B}) + \bar{A}}$$

QUESTION 40

Free Response Question: Find f(9) according to the recursive function definition shown below.

f(9) =

```
          f(x-3)+1    when x>0
f(x)=     f(x+2)-2    when x=0
          1           when x<0
```