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

Which of the following is equivalent to the expression `0b111100`?

A. 60_{10} B. 330_4 C. 74_8 D. $3C_{16}$ E. All are equivalent

QUESTION 2

What is output by the code to the right?

A. `5` B. `6`

C. `7`

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

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

```
int h=5;
h++;
out.println(h++);
```

QUESTION 3

What is output by the code to the right(e's indicate blank spaces)?

A. `|212eeee|eeeeeeeeeeTu|`

B.
`|212 is greater than 7|Turn the volume to 11|`

C. `|212 is g|Turn the vol|`

D. `|eeeeTur|21eeeeeeeeee|`

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

```
String h="212 is greater than 7";
String s="Turn the volume to 11";
out.printf("|%-7.3s|%12.2s|%n",h,s);
```

QUESTION 4

What is output by the code to the right?

A. `erminatorll be` B. `erminatorl be`

C. `erminator b` D. `erminatorl b`

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

```
String h="I'm the Terminator";
String s="I'll be back.";
String j;
j=h.substring(9)+s.substring(3,6);
out.println(j);
```

QUESTION 5

What is output by the code to the right?

A. `True` B. `False` C. `false` D. `true`

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

```
boolean a=true;
boolean b=false;
boolean c=true;
c=c^b^a;
out.println(c);
```

QUESTION 6

What is output by the code to the right?

A. `6.0` B. `5.6` C.`5.0` D. `6`

E. There is no output due to an error.

```
double f=5.6;
Math.round(f);
out.println(f);
```

QUESTION 7

What is the output by the code to the right?

A. `34` B. `24`

C. `14` D. `1`

E. `2`

```
int y=5;
if(y==6)
 out.print(1);
else if(y<=5)
 out.print(2);
else
 out.print(3);
 out.print(4);
```

QUESTION 8

What is the output by the code to the right?

A. 13 B. 19

C. 10 D. 16

E. 3

```
int num=3;
for(int y=4;y<64;y*=2)
 num+=num/2;
out.println(num);
```

QUESTION 9

What is output by the code to the right?

A. 2008 B. 2010

C. 2007 D. 2009

E. 2011

```
String h="peakedInMiddleSchool";
int sum=0;
for(int y=0;y<h.length();y++)
 sum+=h.charAt(y);
out.println(sum);
```

QUESTION 10

What is the output by the code to the right ?

A. 4 B. 5

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

D. There is no output due to a runtime error

E. Output cannot be determined until runtime.

```
int[]k= {1,2,3,4};
k= {1,2,3,5};
out.println(k[3]);
```

QUESTION 11

What is the output by the code to the right?

A. 1

B. 5

C. 0

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

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

```
String s="1 -1 1 1 -1 1 -1 4 -3 0";
int num=0;
Scanner sc=new Scanner(s);
while(sc.nextInt()%2!=0) {
 num+=sc.nextInt();
}
out.println(num);
```

QUESTION 12

What is the output by the code to the right ?

A. 512 B.256

C. 64 D.128

E. 1

```
String s="*";
for(int y=0;y<8;y++)
 s+=s;
out.println(s.length());
```

QUESTION 13

What is the correct **reverse** order of precedence for the operators to the right ?

A. III, IV, II, I B. IV, III, II, I

C. II, IV, III, I D. I, II, III, IV

E. IV, III, II, I

```
I. *
II. >>
III. instanceof
IV. &(bitwise)
```

QUESTION 14

What is the output by the code to the right ?

A. 4 B. 16

C. 8 D. 2

E. 1

```
out.println
      (Float.SIZE/Integer.BYTES);
```

QUESTION 15

What is the output by the code to the right ?

A. `true`

B. `212`

C. `2`

D. `3`

E. There is no output due to an error.

```
ArrayList<Integer>a=new
ArrayList<Integer>();
a.add(212);
a.add(7);
a.add(0,9);
a.set(0, 5);
a.add(8);
Collections.reverse(a);
Collections.sort(a.subList(0, 3));
out.println(a.get(212));
```

QUESTION 16

What is the output by the code to the right ?

A. `True` B. `False`

C. `true` D. `false`

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

```
Integer a=128;
Integer b=128;
out.println(a==b);
```

QUESTION 17

What is the output by the code to the right ?

A. `0` B. `2`

C. `1` D. No output.

E. There is no output due to an error.

```
int i;
char b='a';
switch(b) {
 case 'b':i=1;break;
 case 'a':i=2;break;
}
out.println(i);
```

QUESTION 18

What is output by the following code, assuming it is in the same class as the code to the right ?

`out.println(fun(null));`

A. `1` B. `2`

C. `3`

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

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

```
int fun(Object o) {
 return 1;
}
int fun(double d) {
 return 2;
}
int fun(double[] d) {
 return 3;
}
```

QUESTION 19

What could replace **<1*>** in the code to the right, so that the code will compile?

A. `static` B. `default`

C. `protected` D. None of the above.

E. More than one of the above.

```
interface I{
 public int ret();
 <1*> void show(int y) {
  out.println(y*y);
 }
}
```

QUESTION 20

What is the value of `0xABC`?

A. 2758_{10} B. 5374_{8} C. 101010110100_{2} D. 1810_{12} E. None of the above.

QUESTION 21

What is the output by the code to the right ?

A. `SeCHol15gn2_a173e32122GS13--i3271nonn23eang132`
B. `15Hoig12H117Sn-onH222_CS_23go272ngSH13GleS1n32`
C. `SeCHol15gn2_a173o32122GS13--o3271nonn23eang13`
D. `15Hoig12H117Sn-inH222_CS_23go272ngSH13GliS1n32`
E. There is no output due to a runtime error.

```
String h="Hole-in-one_CSGang";
for(int y=0;y<10;y++) {
int k=((((y+3)*4)+1)*5+2)%h.length();
 h=h.substring(k+1)+h.charAt(k)
        +h.substring(0,k);
 h=h.substring(h.length()/2)+
    h.substring(0,h.length()/2);
 h+=""+h.charAt(k%h.length())+k;
}
out.println(h);
```

QUESTION 22

What is output by the code to the right?

A. `164`
B. `182`
C. `165`
D. `183`
E. `172`

```
out.println(32^23|212&421);
```

QUESTION 23

What is the value of the reverse polish notation expression to the right?

A. `641`
B. `644`
C. `638`
D. `647`
E. None of the above.

```
42 10 * 212 17 + - 3 * 68 +
```

QUESTION 24

What is output by the code to the right?

A. `81`
B. `9`
C. `82`
D. `2457`
E. This is no output due to an error.

```
int y=17;
String s=Integer.toString(y,4);
y=Integer.parseInt(s,8);
s=Integer.toHexString(y);
y=Integer.parseInt(s,12);
s=Integer.toString(y,7);
y=Integer.parseInt(s,9);
out.println(y);
```

QUESTION 25

What is the Big O runtime of the code to the right(N=n)?

A. $O(N^2 \log N)$
B. $O(N^3)$
C. $O(N \log N)$
D. $O((\log N)^3)$
E. $O(N)$

```
int n=30, sum=0;
for(int y=0;y<n;y++)
 for(int x=y-3;x<y+3;x++)
  for(int h=1;h<x;h*=2)
    sum++;
out.println(sum);
```

QUESTION 26

What is output by the code to the right?

A. `false true false`
B. `true true true`
C. `true false false`
D. `true true false`
E. `true false true`

```
String s1="GetGrinched";
String s2="Sandy_Freak!!";
String s3="212 > 7 > 5?";
String r1="G[a-z]*et[A-Za-z]+";
String r2="(\\w&\\D){7,212}";
String r3="212 > 7 > 5?";
out.print(s1.matches(r1)+" ");
out.print(s2.matches(r2)+" ");
out.println(s3.matches(r3));
```

QUESTION 27

Which of the following is correct?

A. `91` B. `104`

C. `195` D. `182`

E. None of the above are correct.

```
int lim=13;
int s = 0;
for( int o = 1; o <= lim; o++ ){
 for( int i = o; i <= lim; i++ ){
      s++;
 }
}
out.println(s);
```

QUESTION 28

What is output by the line marked `//q28`?

A. `8` B. `5`

C. `9` D. `13`

E. `10`

QUESTION 29

What is output by the line marked `//q29`?

A. `144` B.`143`

C. `89` D.`90`

E. `233`

QUESTION 30

What of the following is demonstrated by method `recur`?

A. Pythagorean Theorem

B. Dynamic Programming

C. Dijkstra's algorithm

D. A logarithmic sequence

E. The Fibonacci Sequence

```
public static int recur(int y){
 if(y<0)
  return 0;
 else if(y<2)
  return 1;
 return recur(y-1)+recur(y-2);
}
///////client code//////////////////
out.println(recur(5));  //q28
out.println(recur(11));  //q29
```

QUESTION 31

Which of the following can replace **<1*>** in the code to the right?

A. `64.2` B. `8`

C. `k` D. `Integer.MAX_VALUE`

E. All of the above.

```
double k=5;
int y=8;
y+=<1*>;
```

QUESTION 32

What could replace **<1*>** in the code to the right, so that the code works as intended?

A. `push` B. `add`

C. `put` D. More than one of the above.

E. None of the above.

QUESTION 33

Assuming any error has been corrected, what is output by the code to the right ?

A. `212` B. `8`

C. `Shroud` D. `dinghus`

E. There is no output due to an error.

```
Stack<String>s=new Stack<String>();
s. <1*> (""+8);
s. <1*> ("212");
s. <1*> ("Shroud");
s. <1*> ("dinghus");
Collections.reverse(s);
s. <1*> ("@#$$%");
s.pop();
s.pop();
s.peek();
out.println(s.peek());
```

QUESTION 34

What could replace **<1*>** in the code to the right, so that id will be made of the first characters of both `f` and `la` respectively, followed by `n`?

A. `la.charAt(0)+f.charAt(0)+n`
B. `f.charAt(0)+la.charAt(0)+n`
C. `""+f.charAt(0)+la.charAt(0)+n`
D. More than one of the above.
E. None of the above.

QUESTION 35

What is output by the following line of code, if it were inserted in the client code at the point marked `//1`?
`out.println(Student.IDS("Dirk Heath"));`

A. `15tDthir t`
B. `58tDthir t`
C. `58184thir t`
D. `15184thir t`
E. There is no output due to an error.

QUESTION 36

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

A. `Ben 4167enen`
B. `Ben 171enen`
C. `Ben 4eBenen`
D. `Ben 58Benen`
E. There is no output due to an error.

QUESTION 37

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

A. `Sam, Alfonso 22198soam o SA1`
B. `Sam, Alfonso 22sSsoam o SA1`
C. `Sam, Alfonso 22sSsoam o 22sSsoam o`
D. `Sam, Alfonso SA1 SA1`
E. There is no output due to an error.

QUESTION 38

What is output by the line marked `//4` in the client code to the right ?

A. `22sSsoam`
B. `SA1`
C. `22198soam o`
D. `22sSsoam o`
E. There is no output due to an error.

```
class Student{
 String name;
 private String id;
 static int n;
 public Student(String n) {
  name=n;
  id=IDS(name);
 }
 public String getID() {
  return id;
 }
 static String IDS(String h) {
  n+=h.length()*3/2;
  String id=""+n;
id+=h.charAt(n%h.length())+h.charAt(0);

 id+=h.substring(h.length()-2);
 for(int y=1;y<h.length();y*=2)
  id+=h.charAt(y);
  return id;
 }
 public String toString() {
  return name+" "+id;
 }
}
class Graduate extends Student{
 String first, last;
 private String id;
 static int n;
 public Graduate(String f,String la)  {
  super(f+", "+la);
  n++;
  first=f;
  last=la;
  id=<1*>;
 }
 public String toString() {
 return super.toString()+" "+id;
 }
}
/////////client code/////////////////
Student s=new Student("Ben");
Graduate g;
g=new Graduate("Sam","Alfonso");
Student b;
b=new Graduate("William","Cheng");
//1
out.println(s); //2
out.println(g); //3
out.println(g.getID()); //4
```

QUESTION 39

What is the minimum number of indices in a connected graph with n nodes?

QUESTION 40

What is the reverse order traversal of the binary tree created when the following values are inserted in order ?

```
5, 212, -6, 7, 17, 421, -4, 0, 2, 7, 1000, 1
```