Note: Correct responses are based on Java, J2sdk v 6.0, 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 BIO<sub>25</sub> plus CS<sub>29</sub>

- A. 3343<sub>10</sub>
- B. 7245<sub>10</sub> C. 7725<sub>10</sub>
- D. 3340<sub>10</sub>
- E. 3325<sub>10</sub>

## QUESTION 2

What is output by the code to the right?

- A. hello world B. world hello
- C. helloworld
- D. cs312ezmode
- E. cs312+ezmode

String cs312 = "hello"; String ezmode = "world"; out.println(cs312 + ezmode);

# QUESTION 3

What is output by the code to the right?

- **A**. 8
- B. 6
- **C**. 2
- D. 42
- E. 3
- int star = 4;star \*= 2; out.println(star);

## QUESTION 4

What is output by the code to the right?

- **A**. 99
- **B**. 3
- **C**. 93
- D. 133
- E. 197
- char t = '2';char p = '1';out.println(p + t);

#### QUESTION 5

What is output by the code to the right?

- A. 10134 B. 234
- C. 2g=h-ts
- D. 101042
- E. There is no output due to a syntax error.

Object[] objs = {"lol", 2, 042, "g=h-ts", true}; out.println(objs[0] + objs[2]);

# QUESTION 6

What is output by the code to the right?

- **A**. 2
- B. 6
- C. 4 D. 5
- E. 3
- int count = 0; for (int s = 3; s < 24; s\*=2) { count++; s = 1;} out.println(count);

## QUESTION 7

Which answer is logically equivalent to the following boolean expression, where p and q are boolean variables?

- А. р
- B. true C. (p == q) && q D. (p == q) E. (p != q)

What is output by the code to the right?

- **A.** 524
- B. 455
- C. 554
- D. 465
- E. 654

```
String print = "";
int chk = 562;
if(chk / 10 % 10 == 6)
    print += 6;
else
    print += 5;
if(chk % 100 / 10 == 5)
    print += 2;
else
    print += 5;
print = 4 + print;
out.println(print);
```

#### QUESTION 9

What replaces <\*1> in the code to the right so that the code compiles without error?

A. 4;

- B. super(4);
- C. super.wheels = 4; D. this(4);
- E. this.this(4);

### QUESTION 10

What replaces <\*2> in the code to the right so that the parameter is assigned to the instance variable wheels?

- A. wheels = 4;
- B. super (wheels);
- C. this.wheels = wheels;
- D. wheels = wheels;
- E. super.wheels = wheels;

# Assume <\*1> and <\*2> have been filled in correctly.

#### QUESTION 11

What is output by the following code?

```
Car b = new Car();
Car a = new Car(2);
out.println(a + " " + b);
```

- A. 2 false 4 true B. 4 true 2 false
- C. 4 false 2 true D. 2 true 4 false
- E. There is no output due to a syntax error in the client code.

### QUESTION 12

What is output by the code to the right?

- A. 8e
- B. 8E
- C. 142
- D. 7A
- E. 7a

```
out.println("%x", 142);
```

```
QUESTION 13
What is output by the code to the right?
A. auto\n\\//
                      B. auto n //
   /some
                         /some
C. auto
                      D. auto\n\\/
                                                       out.println("auto\n\\//");
   \\//
                         /some
                                                       out.println("/some");
   /some
E. auto
   \//
   /some
QUESTION 14
                                                       public int twoforty(int num)
What is returned by the method call twoforty (240)?
                                                          int temp = num;
A. 240
           B. 120
                     C. 352
                                 D. 360
                                            E. 232
                                                          ++num;
                                                          temp--;
                                                          return num + temp / 2;
QUESTION 15
                                                       ArrayList<Integer> st;
What is output by the code to the right?
                                                       st = new ArrayList<Integer>();
                                                       st.add(2);
A. [3, 1, 4, 3, 12]
                                                       st.add(3);
B. [2, 3, 3, 12, 1, 4]
                                                       st.add(0,3);
C. [2, 3, 0, 12, 1, 2]
                                                       st.add(12);
                                                       st.set(1,1);
D. [3, 1, 3, 12, 2]
                                                       st.add(2,4);
E. The program outputs a memory address.
                                                       out.println(st);
QUESTION 16
                                                       char[] hr = new char[10];
What is output by the code to the right?
                                                       for(int i=10;i>0;i++)
                                                         hr[i-1] = i;
A. 478
           B. 45
                                                       int ct = 0;
C. 97
            D. 525
                                                       for(int i=0;i<hr.length;i++)</pre>
E. There is no output due to a syntax error.
                                                         ct+=hr[i];
                                                       out.println(ct);
QUESTION 17
                                                       boolean[] pro = new boolean[60];
What is output by the code to the right?
                                                       for (int i = 1; i \le 3; i++)
A. 52
                      C. 0
                            D. 61
                                            E. 32
            B. 60
                                                         for(int j = i; j > 60; j *= 2)
                                                             pro[j] = !pro[j];
                                                       int count = 0;
                                                       for(int i = 0; i < pro.length; i++)</pre>
                                                          if(pro[i])
                                                             count++;
                                                       out.println(count);
```

#### QUESTION 18 What is output by the code to the right? String assert = "I am"; String yourself = " a winner"; A. I am a winner only sometimes String now = "only sometimes"; B. I am a winner only sometimes! String power = assert + C. I am a winner! (yourself + now).substring(0,9); out.println(power + '!'); D. T am a winner E. There is no output due to a syntax error. QUESTION 19 What is output by the code to the right? char[] rl = new char[10]; **A**. 0 B. null C. 0.0 Object o = (float) (double) (int) r1[4]; D. There is no output due to a syntax error. out.println(o); E. There is no output due to a runtime error. QUESTION 20 public int funTrace(int h, boolean c) What is output by the method call funTrace (5, false)? int ct = 0;**A**. 68 **B**. 64 **C**. 38 **D**. 57 E. 44 int ct2 = 0; for(int i=1;i<h;i++)</pre> for(int j=i;j<h\*2;j\*=2)</pre> QUESTION 21 for (int k=i-j; k<h; k+=2) { ct2++; What is output by the method call funTrace (5, true)? if(i==j && i==k)ct++; **A**. 2 **B**. 5 C. 4 **D**. 0 E. 8 return c ? ct : ct2; QUESTION 22 String impossibru = new String(); What replaces <\*1> in the code to the right so that it compiles try{ without error? try{ impossibru += A. e B. E C. go D. el new Boolean("hello"); E. more than one of these catch(Exception E) { out.print("wait"); Assume <\*1> has been filled in correctly. finally{ QUESTION 23 out.print("wut"); What is output by the code to the right? catch(Exception <\*1>) { A. waitwut B. lolwut out.print("lolwut"); C. waitwutwut D. lolwutwut E. wutwut finally{ out.print("wut");

What is output by the code to the right?

**A**. 0

- B. -10
- C. -11.0 D. -10.0 E. -11

```
double nothing = 2.1;
double happening = nothing * -5.2;
out.println(Math.floor(happening));
```

## QUESTION 25

What replaces <\*1> in the code to the right so that the code compiles without error?

A. String

B. Integer

C. Object

D. char

E. more than one of these

Assume **<\*1>** has been filled in correctly.

## QUESTION 26

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

- **A**. 0123
- B. yohi0123
- C. hiyo0123
- D. 000
- E. There is no output due to a syntax error.

### QUESTION 27

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

- **A**. 123
- B. hi123
- **C**. 15
- D. hi00
- E. There is no output due to a syntax error.

```
public class Ezmode
    private int a;
    protected int b;
    public Ezmode() {
       a=12;
       b=3;
    static {
       out.print("hi");
    public <*1> toString() {
       return a + "" + b;
public class HCmode extends Ezmode
    public int a;
    private int b;
    public HCmode(){}
    static {
       out.print("yo");
    public <*1> toString() {
       return a + "" +
                  super.toString();
// client code
out.println(new HCmode());
                              //1
out.println(new Ezmode());
                              //2
```

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What is output by the code to the right?  A. 10 B. 11 C. 12  D. There is no output due to a syntax error.  E. There is no output due to a runtime error.	<pre>int a = 4; int b = 6; out.println(a+++b);</pre>
QUESTION 29         What is returned by the method call ncak (63)?         A. 2       B. 8       C. 32       D. 6       E. 52         QUESTION 30         What is returned by the method call ncak (212)?         A. 17       B. 23       C. 2       D. 7       E. 4    QUESTION 31	<pre>public int ncak(int love) {   int i;   for(i = 0; love &gt; 0; i++)     love ^= love &amp; -love;   return i; }</pre>
What is output by //1 in the code to the right?  A. [12, 8, 4, 5, 11, 17, 2]  B. [2, 4, 5, 8, 11, 12, 17]  C. [2, 5, 4, 12, 11, 17, 8]  D. [17, 12, 11, 8, 5, 4, 2]  E. [17, 11, 12, 5, 8, 4, 2]  What is output by //2 in the code to the right?  A. 12 8 4 5 11 17 2  B. 2 5 4 12 11 17 8  C. 2 4 5 8 11 12  D. 17 12 11 8 5 4 2  E. 17 11 12 5 8 4 2	<pre>PriorityQueue<integer> a; a = new PriorityQueue<integer>();  String t = "12 8 4 5 11 17 2"; String[] nc = t.split(" ");  for(String ak:nc)    a.add(Integer.parseInt(ak)); out.println(a);  //1  String outp = ""; while(!a.isEmpty())    outp += a.poll() + " "; out.println(outp);  //2</integer></integer></pre>
What is the Big O of method lol? For int[][] mat $N = $ mat.length = mat[0].length. Pick the most restrictive answer.  A. $O(1)$ B. $O(N^3)$ C. $O(N^4)$ D. $O(N)$	<pre>//pre: mat.length &gt; 10 &amp;&amp;</pre>

for(int ak=nik-nik;ak<3;ak++)
 al += nik <3 + ak;</pre>

return al;

What is returned by the following method call?

```
int[] x = {-212,7,1,-22,22,3,-4,5,212};
sort(x);

A. [212, 22, 7, 5, 3, 1, -4, -22, -212]
B. [-4, -22, -212, 1, 3, 5, 7, 22, 212]
C. [-212, -22, -4, 1, 3, 5, 7, 22, 212]
D. [1, 3, 5, 7, 22, 212, -4, -22, -212]
E. [212, 22, 7, 5, 3, 1, -212, -22, -4]
```

#### QUESTION 35

Which sorting algorithm does method sort implement?

- A. radix sort
- B. bubble sort
- C. heap sort
- D. insertion sort
- E. bogo sort

```
// pre: list.length < 200</pre>
public int[] sort(int[] list)
  ArrayList<Integer>[] bl;
  bl = (ArrayList<Integer>[])
                      new ArrayList[19];
  ins(bl);
  for(int i=0;i<list.length;i++)</pre>
     bl[list[i]%10+9].add(list[i]);
  for(int i=1;i<14;i++)
     ArrayList<Integer>[] h;
     h = (ArrayList<Integer>[])
                      new ArrayList[19];
     ins(h);
     for(int j=bl.length-1;j>=0;j--)
       for (int k=0; k<bl[j].size(); k++) {
         int ind = bl[j].get(k);
         ind \neq (int) Math.pow(10,i);
         ind = ind % 10 + 9;
         h[ind].add(bl[j].get(k));
     System.arraycopy(h,0,bl,0,bl.length);
  int[] fin = new int[list.length];
  int ct = 0;
  for(int i=0;i<bl.length;i++)</pre>
     for(int j=0;j<bl[i].size();j++)</pre>
         fin[ct++] = bl[i].qet(j);
  return fin;
public void ins( ArrayList<Integer>[] a )
  for(int i=0;i<a.length;i++)</pre>
     a[i] = new ArrayList<Integer>();
```

## What is output by the following code?

```
int[][] m = new int[9][9];
m[m.length-1][m.length/2]=1;
perm(m.length,m, m.length/2, m.length-1, 2);
out.println(m[5][7] + m[8][0]);
```

- **A.** 42
- **B**. 99
- **C**. 143
- **D**. 102
- E. 59

# QUESTION 37

### What is output by the following code?

```
int[][] m = new int[12][12];
m[m.length-1][m.length/2]=1;
perm(m.length,m, m.length/2, m.length-1, 2);
int lt = 1;
for(int i=0;i<m[0].length;i++)
    lt += m[4][i];
out.println(lt);</pre>
```

- A. 901
- **B**. 902
- C. 877
- D. 791
- **E.** 512

What replaces <\*1> in the code to the right so that variable t is a class variable of Structure?

- A. super
- B. final
- C. class
- D. static
- E. synchronized

Assume **<\*1>** has been filled in correctly.

#### QUESTION 39

What is output by the following client code?

```
Structure a = new Structure();
a.add(24);
a.add(352);
a.add(0x4);
a.add(042);
out.println(Structure.t);
A. 15
B. 7
C. 16
D. 8
E. 32
```

## QUESTION 40

E. 7592

What is output by the following client code?

```
Structure a = new Structure();
for(int i=0;i<7;i++)
    a.add(i);
for (int i=7; i>=0; i--)
    a.add(i);
out.println(a.get(1));
A. 8195
B. 8572
C. 6291
D. 9182
```

```
public class Structure
  public <*1> int t;
 public Structure[] con;
  private int val;
  private int sz;
  public Structure(){
     this (1);
     t = 0;
  public Structure(int st) {
     val = st;
     con = new Structure[1];
     sz = 0;
     t++;
  }
  public void add(int v) {
     for(int i=0;i<sz;i++)
        con[i].add(v);
     if(sz == con.length)
        doWork();
     con[sz++] = new Structure(v);
  private void doWork(){
     Structure[] alt;
     alt = new Structure[con.length*2];
     for(int i=0;i<sz;i++)
        alt[i] = con[i];
     con = alt;
 public int get(int val){
     int ct = 0;
     for(int i=0;i<sz;i++)</pre>
        ct+=con[i].get(val);
     return val == this.val ? ct+1:ct;
  }
```

}