SELF TEST

1. Given:

```
class CardBoard {
  Short story = 200;
  CardBoard go(CardBoard cb) {
    cb = null;
    return cb;
  }
  public static void main(String[] args) {
    CardBoard c1 = new CardBoard();
    CardBoard c2 = new CardBoard();
    CardBoard c3 = c1.go(c2);
    c1 = null;
    // do Stuff
} }
```

When `// doStuff` is reached, how many objects are eligible for GC?

A. 0
B. 1
C. 2
D. Compilation fails
E. It is not possible to know
F. An exception is thrown at runtime

2. Given:

```
class Alien {
  String invade(short ships) { return "a few"; }
  String invade(short... ships) { return "many"; }
}
class Defender {
  public static void main(String [] args) {
    System.out.println(new Alien().invade(7));
  }
}
```

What is the result?

A. `many`
B. `a few`
C. Compilation fails
D. The output is not predictable
E. An exception is thrown at runtime

3. Given:

```
1. class Dims {
2.   public static void main(String[] args) {
3.     int[][] a = {{1,2,}, {3,4}};
4.     int[] b = (int[]) a[1];
5.     Object o1 = a;
6.     int[][] a2 = (int[][]) o1;
7.     int[] b2 = (int[]) o1;
8.     System.out.println(b[1]);
9. } }
```

What is the result?

A. 2

B. 4

C. An exception is thrown at runtime

D. Compilation fails due to an error on line 4

E. Compilation fails due to an error on line 5

F. Compilation fails due to an error on line 6

G. Compilation fails due to an error on line 7

4. Given:

```
class Mixer {
  Mixer() { }
  Mixer(Mixer m) { m1 = m; }
  Mixer m1;
  public static void main(String[] args) {
    Mixer m2 = new Mixer();
    Mixer m3 = new Mixer(m2);  m3.go();
    Mixer m4 = m3.m1;          m4.go();
    Mixer m5 = m2.m1;          m5.go();
  }
  void go() { System.out.print("hi "); }
}
```

What is the result?

A. `hi`

B. `hi hi`

C. `hi hi hi`

D. Compilation fails
E. `hi`, followed by an exception
F. `hi hi`, followed by an exception

5. Given:

```
class Fizz {
  int x = 5;
  public static void main(String[] args) {
    final Fizz f1 = new Fizz();
    Fizz f2 = new Fizz();
    Fizz f3 = FizzSwitch(f1,f2);
    System.out.println((f1 == f3) + " " + (f1.x == f3.x));
  }
  static Fizz FizzSwitch(Fizz x, Fizz y) {
    final Fizz z = x;
    z.x = 6;
    return z;
} }
```

What is the result?

A. `true true`
B. `false true`
C. `true false`
D. `false false`
E. Compilation fails
F. An exception is thrown at runtime

6. Given:

```
class Bird {
  { System.out.print("b1 "); }
  public Bird() { System.out.print("b2 "); }
}
class Raptor extends Bird {
  static { System.out.print("r1 "); }
  public Raptor() { System.out.print("r2 "); }
  { System.out.print("r3 "); }
  static { System.out.print("r4 "); }
}
class Hawk extends Raptor {
  public static void main(String[] args) {
    System.out.print("pre ");
    new Hawk();
    System.out.println("hawk ");
  }
}
```

What is the result?

A. `pre b1 b2 r3 r2 hawk`

B. `pre b2 b1 r2 r3 hawk`

C. `pre b2 b1 r2 r3 hawk r1 r4`

D. `r1 r4 pre b1 b2 r3 r2 hawk`

E. `r1 r4 pre b2 b1 r2 r3 hawk`

F. `pre r1 r4 b1 b2 r3 r2 hawk`

G. `pre r1 r4 b2 b1 r2 r3 hawk`

H. The order of output cannot be predicted

I. Compilation fails

7. Given:

```
3. public class Bridge {
4.   public enum Suits {
5.     CLUBS(20), DIAMONDS(20), HEARTS(30), SPADES(30),
6.     NOTRUMP(40) { public int getValue(int bid) {
                       return ((bid-1)*30)+40; } };
7.     Suits(int points) {  this.points = points;  }
8.     private int points;
9.     public int getValue(int bid) { return points * bid; }
10.  }
11.  public static void main(String[] args) {
12.    System.out.println(Suits.NOTRUMP.getValue(3));
13.    System.out.println(Suits.SPADES + " " + Suits.SPADES.points);
14.    System.out.println(Suits.values());
15.  }
16. }
```

Which are true? (Choose all that apply.)

A. The output could contain `30`

B. The output could contain `@bf73fa`

C. The output could contain `DIAMONDS`

D. Compilation fails due to an error on line 6

E. Compilation fails due to an error on line 7

F. Compilation fails due to an error on line 8

G. Compilation fails due to an error on line 9

H. Compilation fails due to an error within lines 12 to 14

8. Given:

```
3. public class Ouch {
4.   static int ouch = 7;
5.   public static void main(String[] args) {
6.     new Ouch().go(ouch);
7.     System.out.print(" " + ouch);
8.   }
9.   void go(int ouch) {
10.    ouch++;
11.    for(int ouch = 3; ouch < 6; ouch++)
12.      ;
13.    System.out.print(" " + ouch);
14.  }
15. }
```

What is the result?

A. `5 7`

B. `5 8`

C. `8 7`

D. `8 8`

E. Compilation fails

F. An exception is thrown at runtime

9. Given:

```
3. public class Bertha {
4.   static String s = "";
5.   public static void main(String[] args) {
6.     int x = 4; Boolean y = true; short[] sa = {1,2,3};
7.     doStuff(x, y);
8.     doStuff(x);
9.     doStuff(sa, sa);
10.    System.out.println(s);
11.  }
12.  static void doStuff(Object o)        { s += "1"; }
13.  static void doStuff(Object... o)     { s += "2"; }
14.  static void doStuff(Integer... i)    { s += "3"; }
15.  static void doStuff(Long L)          { s += "4"; }
16. }
```

What is the result?

A. `212`

B. `232`

C. `234`

D. `312`

E. `332`

F. `334`

G. Compilation fails

10. Given:

```
3. class Dozens {
4.   int[] dz = {1,2,3,4,5,6,7,8,9,10,11,12};
5. }
6. public class Eggs {
7.   public static void main(String[] args) {
8.     Dozens [] da = new Dozens[3];
9.     da[0] = new Dozens();
10.    Dozens d = new Dozens();
11.    da[1] = d;
12.    d = null;
13.    da[1] = null;
14.    // do stuff
15.  }
16. }
```

Which two are true about the objects created within `main()`, and eligible for garbage collection when line 14 is reached?

A. Three objects were created

B. Four objects were created

C. Five objects were created

D. Zero objects are eligible for GC

E. One object is eligible for GC

F. Two objects are eligible for GC

G. Three objects are eligible for GC

11. Given:

```
 3. class Beta { }
 4. class Alpha {
 5.   static Beta b1;
 6.   Beta b2;
 7. }
 8. public class Tester {
 9.   public static void main(String[] args) {
10.     Beta b1 = new Beta();     Beta b2 = new Beta();
11.     Alpha a1 = new Alpha();   Alpha a2 = new Alpha();
12.     a1.b1 = b1;
13.     a1.b2 = b1;
14.     a2.b2 = b2;
15.     a1 = null;  b1 = null;  b2 = null;
16.     // do stuff
17.   }
18. }
```

When line 16 is reached, how many objects will be eligible for garbage collection?

A. 0

B. 1

C. 2

D. 3

E. 4

F. 5

12. Given:

```
 3. class Box {
 4.   int size;
 5.   Box(int s) { size = s; }
 6. }
 7. public class Laser {
 8.   public static void main(String[] args) {
 9.     Box b1 = new Box(5);
10.     Box[] ba = go(b1, new Box(6));
11.     ba[0] = b1;
12.     for(Box b : ba) System.out.print(b.size + " ");
13.   }
14.   static Box[] go(Box b1, Box b2) {
15.      b1.size = 4;
16.      Box[] ma = {b2, b1};
17.      return ma;
18.   }
19. }
```

What is the result?

A. `4 4`

B. `5 4`

C. `6 4`

D. `4 5`

E. `5 5`

F. Compilation fails

13. Given:

```
3. public class Dark {
4.   int x = 3;
5.   public static void main(String[] args) {
6.     new Dark().go1();
7.   }
8.   void go1() {
9.     int x;
10.    go2(++x);
11.  }
12.  void go2(int y) {
13.    int x = ++y;
14.    System.out.println(x);
15.  }
16. }
```

What is the result?

A. 2

B. 3

C. 4

D. 5

E. Compilation fails

F. An exception is thrown at runtime