ECE 30862 Fall 2014, First Exam

DO NOT START WORKING ON THIS UNTIL TOLD TO DO SO. LEAVE IT ON THE DESK.

THE LAST PAGE IS THE ANSWER SHEET. TEAR IT OFF AND PUT ALL ANSWERS THERE. TURN IN BOTH PARTS OF THE TEST WHEN FINISHED.

You have until 9:00PM to take this exam. Every question is worth 2.5 points. The total number of points should be 100. After taking the test turn in both the test and the answer sheet.

Your exam should have 7 (seven) pages total (including this cover page, one almost entire blank page and the answer sheet). As soon as the test begins, check that your exam is complete and *let Prof. Midkiff know immediately if it does not.*

This exam is open book, open notes, but absolutely no electronics. If you have a question, please ask for clarification. If the question is not resolved, state on the test whatever assumptions you need to make to answer the question, and answer it under those assumptions. *Check the front board occasionally for corrections.*

I have neither given nor received help during this exam from any other person or electronic source, and I understand that if I have I will be guilty of cheating and will fail the exam and perhaps the course.

Name (must be signed to be graded):

Name (printed, worth 1 pt):

Last four digits of your ID:

First set of questions, static functions. Fill in the corresponding line in your answer sheet with what is printed when each line in **class Main** that has a comment indicating a question number is executed. If the line would produce an error at either compile or run time put an "E" for the answer on the answer sheet.

```
public class B {
   public B( ) { }

   public static void s1( ) {
      System.out.println("B");
   }
   public static void s2( ) {
      System.out.println("B");
   }
   public static void s3( ) {
      System.out.println("B");
   }
}

public class D1 extends B {
   public D1( ) { }

   public static void s2( ) {
      System.out.println("D1");
   }
   public static void s3( ) {
      System.out.println("D1");
   }
   public static void s5( ) {
      System.out.println("D1");
   }
}

public class D2 extends D1 {
   public static void s3( ) {
      System.out.println("D2");
   }
   public static void s4( ) {
      System.out.println("D2");
   }
   public static void s5( ) {
      System.out.println("D2");
   }
}
```

```
class Main {
   public static void main(String args[]) {

      B b = new B( );
      D1 d1 = new D1( );
      D2 d2 = new D2( );

      b.s1( ); // Q1
      d1.s1( ); // Q2

      b.s2( ); // Q3
      d1.s2( ); // Q4
      d2.s2( ); // Q5

      b.s4( ); // Q6
      d2.s4( ); // Q7

      d2.s5( ); // Q8

      b = d1;
      b.s1( ); // Q9
      b.s2( ); // Q10

      b = d2;
      b.s2( ); // Q11
   }
}
```

Question 12

class D2 has no constructor defined in it. Of the following, pick the most correct and write the answer on the answer sheet.

a. When the call to **D( )** is made in the **main** method an error will occur at runtime because no constructor exists.

b. A compile time error will occur where the call to **D( )** is made in the **main** method.

c. A default zero arg constructor will be supplied by java compiler.

d. None of the above.

Second set of questions. Fill in the corresponding line in your answer sheet with what is printed when each line in **class Main** that has a comment indicating a question is executed. If the line would produce an error at either compile or run time put an "E" for the answer on the answer sheet.

```
public class B {

    public B( ) { }

    public void m1( ) {
       m3( );
    }
    public void m2( ) {
       System.out.println("B");
    }
    public void m3( ) {
       System.out.println("B");
    }
}

public class D1 extends B {

    public D1( ) { }

    public void m2( ) {
       System.out.println("D1");
    }
    public void m3( ) {
       System.out.println("D1");
    }
    public void m5( ) {
       System.out.println("D1");
    }

}

public class D2 extends D1 {

    public void m3( ) {
       System.out.println("D2");
    }
    public void m4( ) {
       System.out.println("D2");
    }
    public void m5( ) {
       System.out.println("D2");
    }
}
```

```
class Main {

    public static void main(String args[]) {

       B b = new B( );
       D1 d1 = new D1( );
       D2 d2 = new D2( );

       b.m1( ); // Q13
       d1.m1( ); // Q14

       b.m2( ); // Q15
       d1.m2( ); // Q16
       d2.m2( ); // Q17

       b.m4( ); // Q18
       d1.m4( ); // Q19
       d2.m4( ); // Q20

       b.m5( ); // Q21
       d2.m5( ); // Q22

       b = d1;
       b.m1( ); // Q23
       b.m2( ); // Q24

       b = d2;
       b.m2( ); // Q25
       b.m4( ); // Q26
       b.m5( ); // Q27

       d2 = b;       // Q28
       d2 = (D2) b; //  Q29
       d1 = (D1) b;  //Q30
    }
}
```

Third set of questions. Indicate in the proper lines on the answer key what is printed by lines with comments about Q31, Q32 and Q33 when they execute. Answer "E" if the line would lead to either a compile or runtime error. Answer the additional question below the program.

```java
public class B {

    public B( ) { }

    public void s1( ) {
        System.out.println("B");
    }
    public void s2( ) {
        System.out.println("B");
    }
    public void s3( ) {
        System.out.println("B");
    }
}

public interface I1 {

    public void s2( );
    public void s3( );
    public void s4( );

}

public interface I2 {

    public void s3( );
    public void s4( );
    public void s5( );

}
```

```java
public class D extends B implements I1, I2 {
    public void s4( ) {
        System.out.println("D");
    }
    public void s5( ) {
        System.out.println("D");
    }
}

class Main {

    public static void main(String args[]) {

        I1 i1 = new I1( );
        D d = new D( );
        d.s3( ); // Q31
        d.s4( ); // Q32
        d.s5( ); // Q33
    }
}
```

Question 34
The line " I1 i1 = new I1( );" is present in Main. Pick the answer that is most correct.

a. I1 must be constructed since it is implemented.

b. There should be a similar call for I2 to construct it.

c. This line will result in a compile time error since constructors cannot be called on Interfaces.

d. The default zero arg constructor for I1 will be called.

e. **a** and **b**.

f. **a**, **b** and **d**

Fourth set of questions. Fill in the corresponding line in your answer sheet with what is printed when each line in **class Main** that has a comment indicating a question is executed. If no method exists that matches the call, answer "None". If more than one method exists that matches the call and javac would be unable to determine which of the matching methods should called, answer "A" (for ambiguous).

```
public class B {

   public B( ) { }

   public void foo(short s, double d) {
      System.out.println("sd");
   }
   public void foo(short s, B b, double d) {
      System.out.println("sBd");
   }
   public void foo(char c, D d) {
      System.out.println("cD");
   }
   public void foo(float f) {
      System.out.println("f");
   }
   public void foo(double d) {
      System.out.println("d");
   }
   public void foo(B b) {
      System.out.println("B");
   }
}

public class D extends B {

   public D( ) { }

   public void foo(int i, B b, float f) {
      System.out.println("iBf");
   }
   public void foo(int i, B b, double d) {
      System.out.println("iBd");
   }
   public void foo(char c, B b, float f) {
      System.out.println("cBf");
   }
   public void foo(D d) {
      System.out.println("D");
   }
   public void foo(short s, D d, float f) {
      System.out.println("sDf");
   }
}
```

```
class Main {

   public static void main(String args[]) {

      short s = 1;
      int i = 2;
      float f = 1.0f;
      double d = 2.0;
      B bObj = new B( );
      D dObj = new D( );

      dObj.foo(s, bObj, f); // Q35
      bObj.foo(s, dObj, f); // Q36
      dObj.foo( ); // Q37
      bObj.foo(s, d); // Q38
      bObj.foo(s); // Q39
   }
}
```

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ECE 30862 Fall 2013 Second Exam Answer Sheet

All answers should be on this sheet. Both this sheet and your test must be signed and turned in. You may detach this sheet from the rest of the test to make it easier to write your answers on it. Each question is worth 4 points.

I promise that I have neither Given nor received disallowed aid on this test.

Name (Printed):   Name (Signed):

1.   **21.**

2.   **22.**

3.   **23.**

4.   **24.**

5.   **25.**

6.   **26.**

7.   **27.**

8.   **28.**

9.   **29.**

10.   **30.**

11.   **31.**

12.   **32.**

13.   **33.**

14.   **34.**

15.   **35.**

16.   **36.**

17.   **37.**

18.   **38.**

19.   **39.**

20.