This exam has 3 additional pages with 3 questions.
1. [35 pts] Consider the following code:

```java
interface Fooable
{
    void foo( );
}

interface Barable
{
    void bar( );
}

class B implements Fooable
{
    public void foo( )
    {
    }
}

class C extends B implements Barable
{
    public void bar( )
    {
    }
}

class D
{
    public void foo( )
    {
    }

    public void bar( )
    {
    }
}
```

(a) Draw the inheritance hierarchy for all the classes and interfaces shown above.

(b) which of the following lines of code are legal?

```
Fooable obj = new Fooable( );
Fooable obj = new B( );
Fooable obj = new C( );
Barable obj = new C( );
Barable obj = new D( );
```

(c) Suppose class E IS-A Fooable, Barable, and a D. Write the minimal class declaration for E.
2. [30 pts] Answer each part TRUE or FALSE

(a) An interface is an abstract class.
(b) An interface can declare instance data.
(c) Any method in an interface must be public.
(d) All methods in an interface must be abstract.
(e) An interface can have no methods at all.
(f) An interface can extend another interface.
(g) An interface can declare constructors.
(h) A class may extend more than one class.
(i) A class may implement more than one interface.
(j) A class may extend one class and implement one interface.
(k) An interface may implement some of its methods.
(l) Methods in an interface may provide a throws list.
(m) All methods in an interface must have a void return type.
(n) Throwable is an interface.
(o) Object is an abstract class.
3. [35 pts] Method contains takes an array of integers and returns true if there exists any item in the array that satisfies a specified condition.

For instance, in the following code fragment:

```java
int[] input = {100, 37, 49};

boolean result1 = contains(input, new Prime());
boolean result2 = contains(input, new PerfectSquare());
boolean result3 = contains(input, new Negative());
```

The intended result is that result1 is true because 37 is a prime number, result2 is true because both 100 and 49 are perfect squares, and result3 is false because there are no negative numbers in the array.

Implement the following components:

(a) An interface that will be used to specify the second parameter to contains.
(b) The contains method (which is a static method).
(c) The class Negative.