

For Review Day

Unit 6 Test - Free Response Practice

Name KEY

1. Given that Cat and Dog extend the Pet class. A Cat 'is-a' Pet, a Dog 'is-a' Pet. The Pet class is specified as following:

```
public class Pet {
    private String myName;

    public Pet (String name) {
        myName = name;
    }

    public String speak() {
        return "I'm a pet";
    }

    public String getName() {
        return myName;
    }

    /* returns true if myName is equal in the two objects */
    public Boolean equals(Object obj) {
        /* implementation not shown */
    }
}
```

a) Finish the overridden equals method for the Cat class.

```
public boolean equals (Object obj) {
    if (!(obj instanceof Cat))
        return false;
    Cat c = (Cat) obj;
    if (getMiceEaten() == c.getMiceEaten() && getName().equals(c.getName()))
        return true;
    else
        return false;
}
```

b) write the entire Cat class including a constructor and the speak method. Cats say "I'm a pet and I meow". In addition to a name, the cat has an integer *miceEaten* instance variable. Make *miceEaten* assigned randomly from integers between 1 and 5 inclusive. This indicated the number of mice a cat can catch and eat per week. Use good principles of inheritance when you write constructors and methods. Use super calls as necessary. The Cat class needs a *getMiceEaten* method rather than a *getLength* method.

* need *mice eaten* instance variable

* need constructor

* need speak method

* need *getMiceEaten* method

```
public class Cat extends Pet {
    private int miceEaten;

    public Cat (String s) {
        super (s);
        miceEaten = (int) (Math.random() * 5) + 1;
    }

    public String speak () {
        return super.speak () + " and i meow.";
    }

    public int getMiceEaten () {
        return miceEaten;
    }
}
```

c) Write some code within a main method in which you create an array of n cat objects. n is a randomly assigned integer from 5 to 15 inclusive. Sum the number of mice that your cat collection can eat per week. Display this number. Use this line of code to grab a name for each object:

String nm = <input from user to grab name>;

```
int n = (int)(11 * Math.random()) + 5;
Cat[] cats = new Cat[n];
int sum = 0;
for (int i = 0; i < n; i++) {
    String nm = <input>;
    cats[i] = new Cat(nm);
    sum += cats[i].getMiceEaten();
}
System.out.println ("My cat eats: " + sum +
    " mice per week!");
```