Printed Name:_____

Instructions. Answer all of the following questions. This is a "closed book" examination and you must work entirely on your own. You may not use a computing or communications device of any kind. Your answers need not conform to the course style guide. All questions that involve code or are about code use the Java programming language.

This work complies with the JMU Honor Code.

Signature:_____

1. (16 points) Given the attached UML class diagram for the `Cat` class, and the following declarations and initializations/instantiations in a method name `main()` in a class named `Pet`, indicate whether each of the following statements (also in the method named `main()`, immediately after the declarations and initializations/instantiations) will:

    N - not compile

    X - Compile but generate an exception at runtime

    R - compile and run without generating an exception

```
boolean sameBreed;
Cat fluffy;
Cat kitty = null;
int numAdopted;
double leftover;
String cute, stylish;
String[] breed = {"PERSIAN", "SIAMESE"};

fluffy = new Cat("SIAMESE", 16);

// This is where the statements below would be
// (one statement per question)
```

1.1. _____ `cute = Cat.PERSIAN;`

1.2 _____ `sameBreed = fluffy.isBreed("PERSIAN");`

1.3 _____ `leftover = fluffy.eat(10);`

1.4 _____ `leftover = Cat.eat(2);`

1.5 _____ `System.out.println(breed[2] + " is stylish");`

1.6 _____ `cute = fluffy.breed;`

1.7 _____ `leftover = kitty.eat(10);`

1.8 _____ `fluffy = new Cat();`

2. (16 points) Consider the following class written in Java:

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

        int petCount;
        String mascot;

        petCount = Integer.parseInt(args[0]);
        mascot = args[1];
    }
}
```

Indicate the best description of each of the following **as it is used in this fragment**. You may use a description more than once.

2.1_____ args   A. The "element of" operator

2.2_____ The [] in args[1]   B. The membership operator

2.3_____ 1   C. An array of references to String objects

2.4_____ args[0]   D. An int variable

2.5_____ parseInt   E. An int literal

2.6_____ .   F. A double literal

2.7_____ petCount   G. A double variable

2.8_____ Integer   H. A reference to a String object

                                       I. The name of a class

                                       J. The name of a static method

                                       K. The name of a non-static method

3. (12 points) Given the following declarations:

```
boolean    hungry;
boolean[]  thirsty;
String     sleepy;
String[]   whiny;
```

indicate whether each of the following is true or false. Spell out the whole word true or false.

3.1_____ `hungry` is a reference type.

3.2_____ `thirsty` is a reference type.

3.3_____ `thirsty[0]` is a reference type.

3.4_____ `sleepy` is a reference type.

3.5_____ `whiny` is a reference type.

3.6_____ `whiny[0]` is a reference type.

4. (6 pts) Determine what will be printed by the code fragment below.

```java
int k = 6;
int m = 10;
int p = 4;
System.out.println("Go");
if (k > p) {
    System.out.println("A");
    if (m > p) {
        System.out.println("B");
    } else if (m > k) {
        System.out.println("C");
    }
    System.out.println("D");
}
System.out.println("E");
```
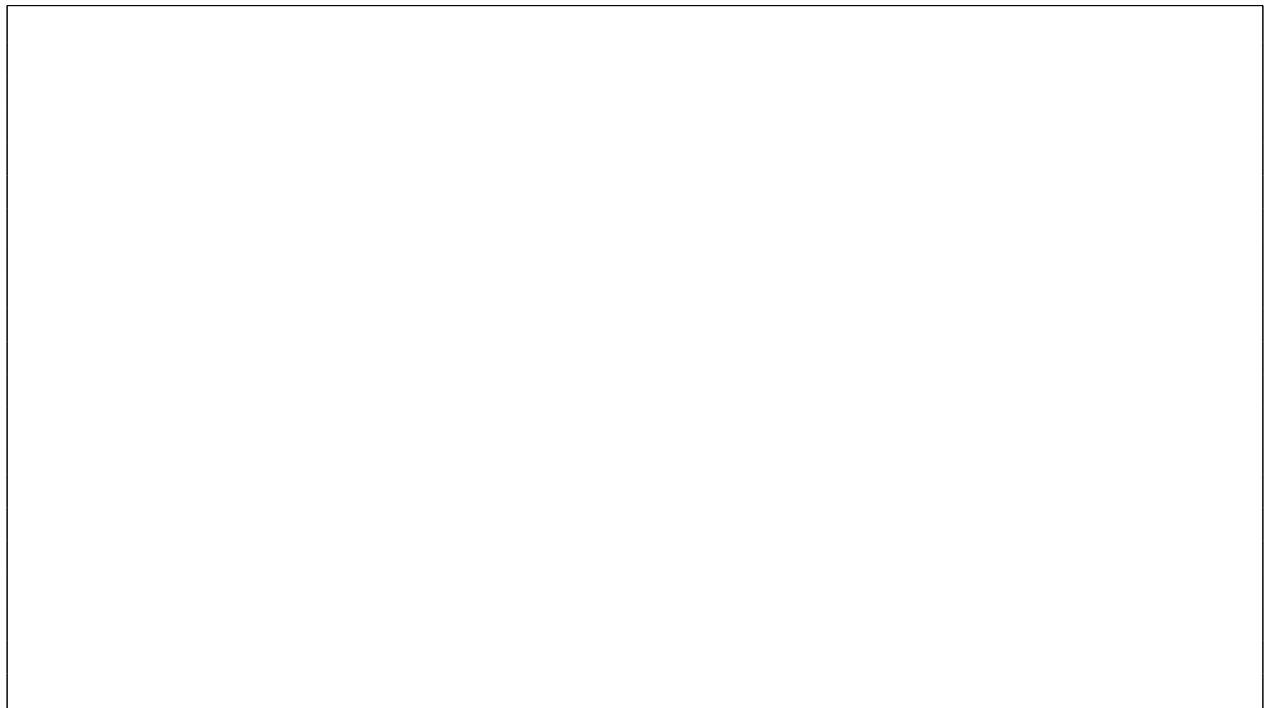
5. (10 points) Show what will be printed by the code fragment that below.

```java
int k;
for (k = 1; k <= 6; k++) {
    System.out.print(k + "-");
}
System.out.print(k);
```


6. (15 points) Write the body of the method below so that it returns the product (think multiplication) of only the integer values in the array, nums, that are divisible by three.

```java
public static int multiplyDiv3(int[] nums) {
```



```java
}
```

Given the attached UML class diagram for the Cat class, implement the following. Your answer to each question must be complete (i.e., include all necessary declaration statements, all other statements, etc.) and must use the exact names/identifiers in the UML class diagram. Do not include the declaration of the class itself.

7. (10 points) The two-parameter constructor. As with all constructors, it must initialize all of the attributes. The `foodLeft` must explicitly be initialized to `bowlSize`.

8. (10 points) The `eat()` method must decrease the `foodLeft` in the bowl by `amount` if and only if there is enough food in the bowl for the cat to eat that amount. It must return the `foodLeft` in the bowl after the cat has eaten.

For example, if `foodLeft` is `10.0`, `eat(2.5)` must return the value `7.5`. As another example, if `foodLeft` is `10.0`, `eat(15)` must return the value `10.0`.

9. (5 points) The `isBreed()` method. It must return `true` if the `breed` attribute is equal to the `breed` parameter and must return `false` otherwise. ***Your implementation must not use an `if` statement, loop, or ternary operator.***

Attachments

Cat
+ <u>PERSIAN: String = new String("PERSIAN")</u> - breed: String - bowlSize: double - foodLeft: double
+ Cat() + Cat(breed: String, bowlSize: double) + eat(amount: double): double + isBreed(breed): boolean

PERSIAN is
declared to be final