CSC 207H 2010 Java Quiz
Duration — 35 minutes
Aids allowed: none

**Student Number:** |_|_|_|_|_|_|_|_|_|_|_|

**Last Name:** _____ **First Name:** _____

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(Please fill out the identification section above and read the instructions below.)
*Good Luck!*

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This midterm consists of 3 questions on 4 pages (including this one). *When you receive the signal to start, please make sure that your copy is complete.* If you use any space for rough work or need to scratch out an answer, circle what you want marked to indicate that it is the answer you are submitting.

# 1: _____/ 3
# 2: _____/ 6
# 3: _____/ 5

TOTAL: _____/14

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## Question 1. [3 MARKS]

**Short Answer**

### Part (a) [1 MARK]

When writing a class, if you want it to contain a variable that keeps track of the number of instances of that class, would you make that variable `static` or non-`static`?

Answer: _____

### Part (b) [1 MARK]

Given a variable `v` that points to an instance of a class `C`, is it possible to access a `public static` variable of `C` using an expression that starts with `v`?

Answer (circle one): YES NO

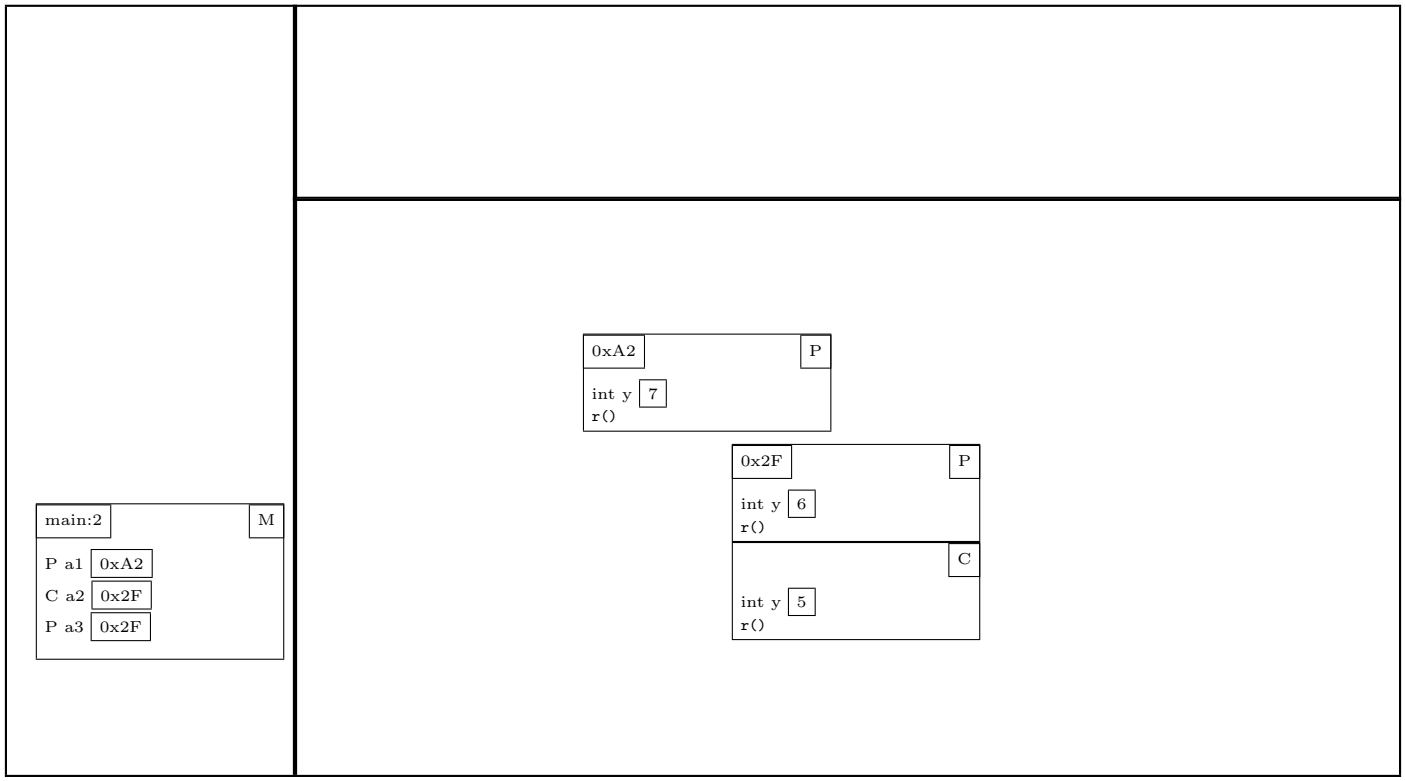
### Part (c) [1 MARK]

When writing a subclass `Sub` of a class `Sup`, is it possible to customize (override) the behaviour of a `static` method of `Sup`?

Answer (circle one): YES NO

## Question 2. [6 MARKS]

Suppose we are executing a Java program, and at this moment the memory model looks as shown below. (The contents of the static space is not included because it is not relevant.)




Circle the best answer to each of the following multiple-choice questions.

**Part (a)** [1 MARK] To access `P`'s `y` using `a2`, I need to do
(1) `a2.y` (2) `a2.(P)y` (3) `((P) a2).y` (4) `a2.super.y`
(5) None of the above work, but it can be done.
(6) It cannot be done.

**Part (b)** [1 MARK] To access `C`'s `y` using `a3`, I need to do
(1) `a3.y` (2) `a3.this.y` (3) `a3.(C)y` (4) `((C) a3).y`
(5) None of the above work, but it can be done.
(6) It cannot be done.

**Part (c)** [1 MARK] To call `P`'s method `r` using `a2`, I need to do
(1) `a2.r()` (2) `a2.(P).r()` (3) `((P) a2).r()` (4) `a2.super.r()`
(5) None of the above work, but it can be done.
(6) It cannot be done.

**Part (d)** [1 MARK] To access `C`'s method `r` using `a3`, I need to do
(1) `a3.r()` (2) `a3.this.r()` (3) `a3.(C)r()` (4) `((C) a3).r()`
(5) None of the above work, but it can be done.
(6) It cannot be done.

**Part (e)** [2 MARKS]

In the picture, draw the results of executing the following two statements. If values change, cross them out and write in the new values.

```
a3 = a1;
a3.y = ((P) a2).y
```

## Question 3. [5 MARKS]

**Listeners**

In lecture, we discussed the following class.

```
public class MooingWindow extends JFrame implements ActionListener {

    MooingWindow(String title) {
       super(title);
       JButton myButton = new JButton("Click to moo");
       myButton.addActionListener(this);

       JPanel contents = new JPanel();
       contents.add(myButton);
       this.setContentPane(contents);
       this.pack();
    }

    public void actionPerformed(ActionEvent e) {
        JOptionPane.showMessageDialog(this, "Moo");
    }

}

public class Main3 {
    public static void main(String[] args) {
        MooingWindow mw1 = new MooingWindow("Moo Window One");
        mw1.setVisible(true);
    }
}
```

**Part (a)** [1 MARK] What does the `super` call in the constructor do?

**Part (b)** [4 MARKS]

This window is a listener for the button. If we were instead to write a separate class `BListener` to be the listener, what would need to change? You are encouraged to answer in point form.

This page is for rough work and for answers that didn't fit in the space provided.