

CSC 148H1 S February Midterm 2007  
L5101

Duration — 50 minutes

Student Number: \_\_\_\_\_

Lab day and time: \_\_\_\_\_

Family Name: \_\_\_\_\_

Given Name: \_\_\_\_\_

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*Do **not** turn this page until you have received the signal to start.*

*(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 6 pages (including this one).  
*When you receive the signal to start, please make sure that your copy is complete.*

# 1: \_\_\_\_\_/ 8

# 2: \_\_\_\_\_/ 8

For 1 bonus mark write your student number at the bottom of pages 2-6.

# 3: \_\_\_\_\_/ 8

If you do any rough work, indicate clearly what you want marked.

TOTAL: \_\_\_\_\_/24

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**Question 2.** [8 MARKS]

Consider the following class for nodes of a linked list of integers:

```
class Node {
    public int value;
    public Node link;
}
```

Write method `doubleUp()` in the following linked list class:

```
class LinkedList {

    private Node head;

    // Various list methods not shown.

    /** Double the length of the list, putting a duplicate of each element beside each element.
        For example, if the list has the four elements 2, 0, 0, 7, then after calling doubleUp
        it has the eight elements 2, 2, 0, 0, 0, 0, 7, 7. */
    public void doubleUp() {
```

**Question 3.** [8 MARKS]

On the next page, draw the memory model for the following program just after the 3rd time that `s()` returns (but before the method that called `s()` returns).

```
class M {
    public static void main(String[] a) {
        C c = new C();
        c.f(1);
        D d1 = new D();
        d1.m(10);
        C d2 = new D();
        d2.f(100);
    }
}
```

```
class C {

    public static int i;

    public void f(int k) {
        m(k);
    }

    public void m(int k) {
        i = i + k;
        s();
    }

    public static void s() {
        i = i + 1000;
    }
}
```

```
class D extends C {

    public int i;

    public void m(int k) {
        i = i + k + 10000;
        s();
    }
}
```



Total Marks = 24