CSC 148H L0301 Midterm 2003 Duration — 50 minutes Aids allowed: none

| Student Number: | ᆫ | 1 | I | ı | I | ı | ı | ı | | |
|----------------------|---|---|---|---|---|---|---|---|------|--|
| Lab day, time, room: | | | | | | | | | | |

Last Name:

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!

First Name:

| 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. | # 1:/11 |
|--|-----------|
| Comments are not required except where indicated, although they may help us mark your answers. They may also get you part marks if you can't figure | # 2:/10 |
| out how to write the code. | # 3:/ 9 |
| Write your student number at the bottom of pages 2-4 of this test. If you use any space for rough work, please indicate clearly what you want marked. | TOTAL:/30 |

Question 1. [11 MARKS]

Complete the body of the method reversedList(Node), according to its external and internal comments.

```
public interface Stack {
  void push(Object o);
  Object pop();
 boolean isEmpty();
public class S implements Stack { /* body not shown */ }
public class Node {
 public Object value;
 public Node link;
 public Node(Object value) { this.value = value; }
}
public class Question1 {
  /** Return a copy of the linked list 'list' in reverse order.
    * Oparam list the first Node (null if empty) in a linked list.
                the first Node (null if empty) in the reversed copy of list. */
  public static Node reversedList(Node list) {
    if (list == null) { return null; }
   Stack s = \text{new } S(); // \text{ this is the only instance of } S you may use.
    // Put the values from list into s.
```

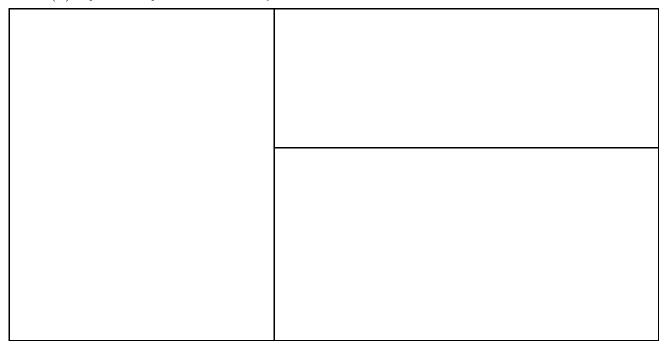
```
// Make reversed list from s. You must get values only from s now, not list.
Node first = new Node(s.pop()); // the first Node in the reversed copy.
Node last = first; // the last Node in the reversed copy.
```

```
return first;
}
```

Question 2. [10 MARKS]

```
public class A {
                                        public class B extends A {
  public static void f(A a) {
                                          public static void f(B b) {
    System.out.println("A.f");
                                          System.out.println("B.f");
    a.g();
                                            b.g();
    a.h();
  public void g() {
                                          public void g() {
    System.out.println("A.g");
                                          System.out.println("B.g");
  private void h() {
                                          private void h() {
    System.out.println("A.h");
                                          System.out.println("B.h");
}
                                        }
public class M {
  public static void main(String[] args) {
    B b = new B();
   b.f(b);
    A.f(b);
  }
}
```

Part (a) [5 MARKS] Draw the memory model when line 1 of B's method f is first reached:



Part (b) [5 MARKS] Write the output from running the entire program M:

Question 3. [9 MARKS]

```
Part (a) [2 MARKS]
```

Write your student number at the bottom of every page of the midterm (except the front page).

```
Part (b) [7 MARKS]
```

Write the body of countInvalidIntegers(BufferedReader) in the following class.

You are **not** required to throw an exception if the user of countInvalidIntegers violates the precondition.

Use the fact that Integer.parseInt(String) throws a NumberFormatException if its argument does not represent an integer.

```
import java.io.*;

public class Question3 {

   /**

    * Return the number of lines from 'br' that don't represent an integer.

    * Requires: br != null.

    */
    public static int countInvalidIntegers(BufferedReader br) throws IOException {
        int count = 0; // the number of lines not representing an integer
```

```
return count;
}
```

Total Marks = 30