UNIVERSITY OF TORONTO
FACULTY OF ARTS AND SCIENCE

TERM TEST #2

CSC 104H1
DURATION — 50 MINUTES

NO AIDS ALLOWED

LAST NAME: _____

FIRST NAME: _____

Do NOT *turn this page until you have received the signal to start.*
(In the meantime, please fill out the identification section above,
and read the instructions below.)

This test consists of 3 questions on 5 pages (including this one). *When you receive the signal to start, please make sure that your copy of the test is complete.*

Please answer questions in the space provided. You will earn 20% for any question you leave blank or write "I cannot answer this question," on. You will earn substantial part marks for writing down the outline of a solution and indicating which steps are missing.

Good Luck!

Question 1.   [20 marks]

Part (a)   [5 marks]

What are the similarities and differences between a token ring local network and a bus local network?

Part (b)   [5 marks]

Describe the trade-offs required when considering ever-larger amounts of random-access memory (RAM), and ever-smaller, faster components for modern computers.

Part (c)   [5 marks]

Describe how an operating system gives the illusion of multi-tasking.

Part (d)   [5 marks]

Explain the hazards intrinsic in web-browsing.

QUESTION 2.   [10 MARKS]

Explain as much as you can about the following expressions and what they produce. You may assume that they were preceded by the expression:

```
(require picturing-programs)
```

PART (A) [2 MARKS]

```
(map add1 (map sqr (map string-length (list "one" "two" "three" "four"))))
```

PART (B) [2 MARKS]

```
(string-length (substring (string-append "two" "fold") 1 4))
```

PART (C) [2 MARKS]

```
(or (and (< 2 3) (> 7 9)) (not (equal? "high" "low")))
```

PART (D) [2 MARKS]

```
(rotate 30 (scale 1.5 (flip-horizontal pic:hacker)))
```

PART (E) [2 MARKS]

```
(define p (make-posn 2 3))
(make-posn (* 3 (posn-y p)) (/ (posn-x p) 2))
```

Question 3.   [10 marks]

Explain as much as you can about how palindrome? works. Explain, step-by-step, what happens when (palindrome? "mum") is run. Describe what is produced by (palindrome? "rotor"). Write a check-expect statement for (palindrome? "rot").

```
(define (palindrome? s)
  (cond
    [(< (string-length s) 2) true]
    [else
     (and
      (equal? (substring s 0 1)
              (substring s (sub1 (string-length s))))
      (palindrome? (substring s 1 (sub1 (string-length s)))))]))
```

1: _____/20

2: _____/10

3: _____/10

TOTAL: _____/40