CSCI 3145 Introduction Parallel Programming
Final exam
Wednesday December 13th, 2000, 12:00 noon to 3:00 pm

FOUR pages
Attempt all questions in the spaces provided. Name: .....
Use additional paper if necessary.
Do not refer to any materials except that provided with this exam paper.

Mark/30

Qu. 1 Answer each of the following briefly:

(a) What is a detached thread? 2

(b) What is meant by the term thread-safe? 2

(c) Can: 2

```
for (i = 0; i < 4; i++) {
    a[i] = a[i + 2];
}
```

be re-written as:

```
forall (i = 0; i < 4; i++) {
    a[i] = a[i + 2];
}
```

and still obtain the correct results? Explain.

(d) Very briefly describe how to multiply two 3×3 matrices using a systolic array approach. 2

(e) Very briefly explain the red-black ordering method of solving Laplace's equation? 2

(f) What is a bitonic sequence? 2

(g) Very briefly explain the two-dimensional sorting algorithm called Shearsort. 2

Qu. 2 (i) Show the steps in sorting the following sequence using *odd-even transposition sort* (a parallel variation of bubble sort): 6

4, 2, 7, 8, 5, 1, 3, 6

(ii) Write a shared memory parallel program in Adsmith to sort a list of *n* integers using *odd-even transposition sort*. (n is assumed to be a power of two.) An Adsmith program is attached giving sample uses of Adsmith routines. Give a clear explanation of your program. 10