CMPT 705 **Midterm Test** **Some Day, 2016**

This is a sample!

Last Name _____ First Name and Initials _____

Student No. _____

NO AIDS allowed. Answer ALL questions on the test paper. Use backs of sheets for scratch work.

Total Marks: 100

1. What problem does Dijkstra's algorithm solve? [5]

2. Describe how the divide-and-conquer algorithm for the Closest Pair problem works. [28]

3. Give an algorithm to detect whether a given undirected graph contains a cycle. If the graph contains a cycle, then your algorithm should output one (not all). The running time of your algorithm should be $O(m+n)$ for a graph with n vertices and m edges. [28]

4. How to reduce finding a feasible circulation with demands to finding a flow? [11]

5. The edge connectivity of an undirected graph is the minimum number k of edges that must be removed to disconnect the graph. For example, the edge connectivity of a tree is 1, and the edge connectivity of a cycle is 2. What is the connection between the edge connectivity of a graph and its minimal cuts. [28]