Name: _____ (First name first)   **Score:** _____

COSC 6360   QUIZ #2   OCTOBER 4, 2010

Closed book. You can have with you one single-sided 8½ by 11 sheet of notes. Each question is worth 20 points.

1. Consider a very small cache that can hold only 4 pages and assume that the cache is managed by the ARC replacement policy. Assuming that the current state of the cache is fully described as

	L1	L2
In cache	4	3
	5	2
Simulated	1	6
	7	9

How would **target_T1** be affected if the next page to be referenced is

a) Page 7? **It will** _increase target_T1 by one _____

b) Page 8? **It will** _remain unchanged_____

2. When does **false sharing** happen in a distributed shared memory system?

When __two or more unrelated variables located in the same page are accessed at the same time _____

__by two or more different processes_____

What problem may it cause?

_Ping-pong effect (This issue is addressed by shared write protocol.)_____

3. What are the major advantage and the major limitation of **Spin**?

a) **Major advantage:** _Very low overhead _____

_____

b) **Major limitation:** _Requires rewriting the whole kernel and all extensions in a type-safe language ___

_____

4. A system of physical clocks consists of two clocks, namely, one that is slow and loses three minutes every hour and another that is fast and advances by three minutes every hour. Assuming that the clocks are managed by Lamport's physical clock protocol, what will be the time marked by each clock at four o'clock given that:

a) Both clocks indicated the correct time at noon;

b) The sole message exchanged between them is a message sent at two o'clock by the processor on which the fast clock resides to the processor on which the slow clock resides;

c) Message transmission delays are negligible.

The slow clock will indicate __4:00 PM___ and the fast clock will indicate _4:12 PM_ at four o'clock.

5. Why do Nooks wrappers replace all **calls by reference** by **calls by value and return**?

In order to delay updates to the kernel data until the call completes, thus eliminating a source of _____

inconsistent updates. _____