Operating Systems **Mini-test 3**
CS4410 Summer 2011 **Monday, 13 June 2011**

Duration: 15 minutes (2 pages)
Name:
NetID:

1 Deadlock Prevention

If we impose a total ordering of all resource types and we require that each process requests resources in an increasing order of enumeration, which of the four necessary deadlock conditions do we break? (mutual exclusion, hold and wait, no preemption, circular wait)

2 Deadlock Avoidance

Suppose we are executing the Banker's algorithm among processes P_1, P_2, P_3, P_4 and P_5. We stop at a point where we have found this partial execution sequence: P_3, P_5, and now we see that either P_1 or P_2 can be executed. We decide to execute P_1 and we continue the execution of the Banker's algorithm.

1. If at the end of the algorithm we succeeded in finding a sequence of execution (we are at a safe state), for example P_3, P_5, P_1, P_2, P_4, would we have been led to the same result if we had chosen P_2 instead of P_1 at the above execution point?

2. Answer the same question if choosing P_1 led us to an unsafe state.

3 Logical vs Physical Address

Can we have multiprogramming in a system with physical = logical address?

In a monoprogramming system, do we have to implement allocation, reallocation or protection mechanism?

4 Contiguous Memory Allocation

What is the main problem of the contiguous memory allocation?

5 Paging

What is the main reason of using Paging as a Memory Management schema?

In a 16-bit system, where the virtual address is split into 4 bits for page number and 12 bits for offset:

1. For the physical address, how many bits are assigned for the offset and how many for the frame number?

2. Answer the same question if the physical address had 32 bits in total and the virtual 16 bits.

6 Page Replacement

Does the LRU algorithm present the Belady's Anomaly?