16.317: Microprocessor Systems Design I
Spring 2012

Lecture 23: Key Questions
March 26, 2012

1. Discuss the general setup of page table and TLB entries.

2. Given the following TLB contents, determine the physical address from the given linear addresses, assuming that all pages are 4 KB.

Virtual page #	Valid	Reference	Dirty	R/W	U/S	Frame #
00000	1	1	0	0	0	00114
00010	1	1	1	1	0	12345
00800	0	0	0	0	0	--
00004	1	0	0	0	1	10000
1F005	0	0	0	0	0	--

Linear addresses:
00004123H

00010FFFH

1F005000H

3. Given the following page directory and page table contents, determine the physical address from the given linear addresses, assuming all pages are 4 KB.

Page directory:

Entry	Valid	Reference	Dirty	R/W	U/S	PT address
0	1	1	0	1	0	01000
1	1	1	0	1	0	01000
2	1	0	0	0	1	02000
3	1	0	1	1	1	01000
4	0	0	0	0	0	--

PT 0 (Starting address: 01000000H)

Entry	Valid	Reference	Dirty	R/W	U/S	Frame #
0	0	0	0	0	0	--
1	1	1	0	1	0	12300
2	1	0	0	0	0	21400
3	1	1	0	1	0	16317

PT 1 (Starting address: 02000000H)

Entry	Valid	Reference	Dirty	R/W	U/S	Frame #
0	1	1	1	1	0	01010
1	1	1	0	0	0	3F000
2	0	0	0	0	0	--
3	1	1	1	1	0	018A2

Linear addresses:
00003FA2H

00801116H