Solutions for Homework 8

7.

(a)			(b)			(c)		
μ-cycle	new μ-cycle		μ-cycle	new μ-cycle		μ-cycle	new μ-cycle	
1	1	PC=PC+1	1	1	PC=PC+1	1	1	PC=PC+1
2	4	SP=PC	2	2	LV=MDR	2	2	LV=MDR
			3	4	SP=PC	3	3	TOS=SP
						4	4	SP=PC

9. In both cases, address size is 8+3+5=16 bits

I.

a. 2^16

b. 2^5

c. 2^3

d. (1+32)8 = 264

e. 2^8

II.

a. same

b. same

c. 2^7

d. (0.5+32)128 = 4160

e. 2^4

10. 4 KB = 1K words => need 10-bit address total

4 memory lines mapped to the same cache line => TAG is 2 bits (2^2=4)

Cache line is 128B = 32 words => need 5 bits within cache line => WORD is 5 bits

What's left are 3 bits for LINE (cache will have 2^3=8 lines)

TAG, LINE, WORDS = 2, 3, 5 bits respectively.