컴퓨터구조-2018-기말고사 답안지

수강반 ( ), 학부/학과 ( ), 학년 ( ), 학번 ( ), 이름 (해 답)

2-(1) 답과 6,7번의 풀이과정과 답은 뒷면에 쓸 것.

1.	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	640	636	6	7	?	8	6	13	27	11

	CC	IF	ID	EX	MEM	WB
2-(2)	5	slt	lw	or	(b)	(b)
	10	sw	slt	(b)	(b)	lw
	14		xor	sub	(b)	sw

	CC	IF	ID	EX	MEM	WB	ForwardA	ForwardB
2-(3) & (4)	5	sw	slt	(b)	lw	or	X	X
	7	xor	sub	sw	slt	(b)	0	0
	9			xor	sub	sw	0	0

	CC	IF	ID	EX	MEM	WB
3-(1)	6	xor	(b)	(b)	bne	or
	9	and	beq	slt	xor	(b)
	12	bne	or	add	and	beq
3-(2)	6	slt	xor	(b)	bne	or
	10	or	add	and	beq	slt
	13	xor	(b)	bne	or	add

	CC	IF	ID	EX	MEM	WB
3-(3)	6	beq	slt	xor	bne	or
	8	and	(b)	beq	slt	xor
	10	or	add	and	(b)	beq
3-(4)	6	beq	slt	xor	bne	or
	9	add	and	lw	beq	slt
	13	slt	xor	bne	or	add

4-(1) [표 1] 초기 상태

	V	Tag	Data
0	1	100	80 - 87
1	1	001	28 - 2F
2	0		
3	0		

V	Tag	Data
0		
0		
1	110	D0 - D7
1	000	18 - 1F

4-(2) [표 2] Program

Instructions	Tag (이진수)	Index (십진수)	H/M
lb $1,0x38($0)	001	3	
lb $2,0x9A($0)	100	3	
lb $3,0x2A($0)	001	1	H
lb $4,0xD4($0)	110	2	H
lb $5,0x06($0)	000	0	
lb $6,0x50($0)	010	2	
lb $7,0xE4($0)	111	0	
lb $8,0x9C($0)	100	3	H

4-(3) [표 3] 최종 상태

	V	Tag	Data
0		111	E0 - E7
1			
2	1	010	50 - 57
3	1	001	38 - 3F

V	Tag	Data
1	000	00 - 07
	100	98 - 9F

5-(1) (5000) ~ (5FFF)

[표 4] Page table

	Valid	PPN
0	0	
1	1	0
2	0	
3	0	
4	1	1
5	1	2
6	1	3
7	0	

[표 5] 5-(2)

Virtual Address	Virtual page number	TLB (H/M)	Page fault (Y/N)	Physical page number	Physical Address
6A38	6	M		3	3A38
20F8	2	M	Y	2	20F8
3800	3	M	Y	1	1800
1BB4	1	M		0	0BB4
2474	2	M		2	2474
50F0	5	M	Y	3	30F0

[표 6] 5-(3)

	Valid	PPN
0	0	
1	1	0
2	1	2
3	1	1
4	0	
5	1	3
6	0	
7	0	

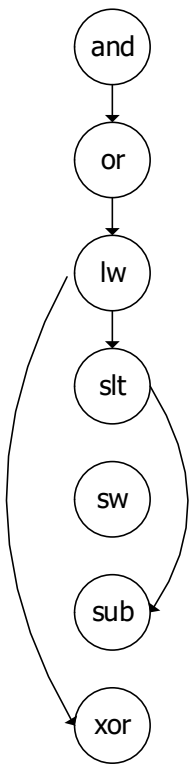
[표 7] 초기 TLB

Valid	Tag	Physical Page Number
1	5	2
0		

[표 8] 5-(4) 최종 TLB

Valid	Tag	Physical Page Number
1	5	3
1	2	2

2. (1)



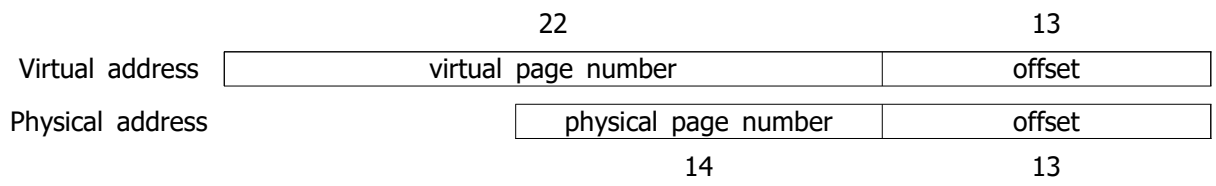
2-(1) 답

6. clock cycle time = $1/(2x10^9) = 0.5 \times 10^{-9}$ (초)

(1) AMAT = $(0.5 + 0.05 \times 50) \times 10^{-9} = 3 \times 10^{-9}$ (초)

(2) AMAT = $(0.5 + 0.05 \times 10 + 0.01 \times 50) \times 10^{-9} = 1.5 \times 10^{-9}$ (초)

7.



(1) $2^{22} \times (1 + 14) = 2^{22} \times 15 = 60$ M (bits)

(2) Number of blocks = 16 KB / 16x4 B = $2^{14} / 2^6 = 2^8$

offset=6 bits, index=8 bits, tag=13 bits

$2^8 \times (1+13+16x32) = 2^8 \times 526 = 131.5$ K (bits)

(3) Number of sets = 16 KB / 16x4 B / 8 = $2^{14} / 2^9 = 2^5$

offset=6 bits, index=5 bits, tag=16 bits

$2^5 \times (1+16+16x32) \times 8 = 2^8 \times 529 = 132.25$ K (bits)

(4) offset=6 bits, index=0 bits, tag=21 bits

$(1+21+16x32) \times 2^8 = 534 \times 2^8 = 133.5$ K (bits)

(5) 8 x (1+22+14) bits = 8 x 37 bits = 37 Bytes