Trịnh Duy Hưng MSSV: 1913652

Bài 1:

	Tag	Index	Offset
Directed map	10	14	8
4-way set associative	12	12	8
Fully associative	24	0	8

Bài 2:

	Tag	Index	Half-word offset
Directed map	11	10	7
4-way set associative	13	8	7
Fully associative	21	0	7

Bài 3:
Hệ thống có 256B caches, 4 words block
=> Index chạy từ 0 tới 15, Tag chạy từ 0 tới 256 / 16 = 16.

Directed map:

	0	4	1	5	65	1	67	46	1	70	2	0
Tag	0	0	0	0	1	0	1	0	0	1	0	0
Index	0	1	0	1	0	0	0	11	0	1	0	0
Hit / Miss	M	M	H	H	M	M	M	M	M	M	H	H

2-way set associative:
=> chỉ còn 1/2 số block, chạy từ 0 tới 7

	0	4	1	5	65	1	67	46	1	70	2	0
Tag	0	0	0	0	2	0	2	1	0	2	0	0
Index	0	1	0	1	0	0	0	2	0	1	0	0
Hit / Miss	M	M	H	H	M	M	M	M	M	M	H	H

Fully associative:

	0	4	1	5	65	1	67	46	1	70	2	0
Tag	0	1	0	1	16	0	16	11	0	17	0	0
Hit / Miss	M	M	H	H	M	H	H	M	H	M	H	H

Bài 4:

Thời gian truy xuất RAM = miss penalty = 10 ns.
1 cycles = 0,5 ns
Hit time = 5 cycles = 0,5 * 5 = 2,5 ns

Directed map:
AMAT = Hit time + Miss rate * miss penalty
= 2,5 + (7/12)*10
= 9,167 (ns)

2-way associative:
AMAT = Hit time + Miss rate * miss penalty
= 2,5 + (7/12)*10
= 9,167 (ns)

Fully associative:
AMAT = Hit time + Miss rate * miss penalty
= 2,5 + (5/12)*10
= 6,667 (ns)

Bài 5:

Miss rate RAM = 100 - 20 - 10 = 70 %

Thời gian truy xuất vùng nhớ trung bình:
= 10 * 20% + 15*10% + 100*70%
= 73,5 (cycles)

Bài 6:

I-Cache Misses = I-Count×I-Cache Miss Rate
D-Cache Misses = LS-Count×D-Cache Miss Rate.

Base CPI = 1
I-cache misses = 1000* 5% = 5
D-cache misses = 100 * 10%*10% = 1

=>CPI = 7