CS224 Preliminary

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Sec:04

1.

No.	Cache Size (KB)	N-way Cache	Word Size	Block Size (no. of words)	No. of Sets	Tag Size (bits)	Index Size (bits)	Block Offset Size (bits)	Byte Offset Size (bits)	Block Replacement Policy
1	64	1	32 bits	4	4096	15	12	2	2	No
2	64	2	32 bits	4	2048	16	11	2	2	Yes
3	64	4	32 bits	8	1024	16	10	3	2	Yes
4	64	Full	32 bits	8	1	26	0	3	2	Yes
9	128	1	16 bits	4	8192	15	13	2	1	No
10	128	2	16 bits	4	4096	16	12	2	1	Yes
11	128	4	16 bits	16	2048	15	11	4	1	Yes
12	128	Full	16 bits	16	1	26	0	4	1	Yes

2.
a)

iterations	1	2	3	4	5
lw t1,0x4(0)	Compulsory	Conflict	Conflict	Conflict	Conflict
lw t2,0xC(0)	Compulsory	Conflict	Conflict	Conflict	Conflict
lw t3,0x8(0)	Compulsory	Conflict	Conflict	Conflict	Conflict

b)
Cache capacity: 8*4 = 32 byte;
Block offset bits = 1 bit;
Byte offset bits = 2bit ;
Block Size = 8 byte;
Index Bit = 2 bit;
V bit = 1 bit per block;
Tag = 26 bit per block;
no of block = 4;

Total Storage = tag+cache+vBit = 26*4+32*8+4*1 = 104+256+4=364

c)
26 AND gate (for tag comparison logic)

4 OR gate
4MUX
4 Equality Comparisons

3.
a)

Sütun1	Sütun2	Sütun3	Sütun4	Sütun5	Sütun6
Instruction	Iteration 1	Iteration 2	Iteration 3	Iteration 4	Iteration 5
lw $t1, 0x4	Compulsory	Conflict	Conflict	Conflict	Conflict
lw $t2, 0xC	Compulsory	Conflict	Conflict	Conflict	Conflict
lw $t3, 0x8	Capacity	Conflict	Conflict	Conflict	Conflict

b)
Cache capacity: 4*2 = 8 byte;
Block offset bits = 0 bit;
Index Bit = 0 bit;
V bit = 1 bit;
Tag = 31 bit per block;
no of block = 2;
1 LRU bit;
total 127?

c)
31 and

2 or
2 mux
2 eq