

HW 11 Solutions to 7(15, 16, 20, 21, 38)

7.15. $AMAT = \text{Hit time} + \text{Miss time} \times \text{Miss penalty}$

$$AMAT = 2\text{ns} + (20 \times 2\text{ns}) \times 0.05 = 4\text{ns}$$

7.16 $AMAT = (1.2 \times 2\text{ns}) + (20 \times 2\text{ns} \times 0.03) = 2.4\text{ns} + 1.2\text{ns} = 3.6\text{ns}$. Yes this is a good choice.

20. Reference: 1 4 8 5 20 17 19 56 9 11 4 43 5 6 9 17

Hit or miss: m m m m m m m m m m m h m h m h h

Final state of cache with LRU order shown right to left

Block #	Element #1 address	Element # 1 address
0	56	8
1	17	9
2		
3	43	11
4	4	20
5	5	
6	6	
7		

21.

Reference: 1 4 8 5 20 17 19 56 9 11 4 43 5 6 9 17

Hit or miss: m m m m m m m m m m m h m h m h h

Final state of cache, with most recently used elements at left and least recently used on right.

Block#: 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
Address: 17 9 6 5 43 4 11 56 19 20 8 1

38.

Rewriting the program will likely reduce compulsory as well as capacity misses (if you are lucky, maybe they will conflict). Increasing the clock rate will have no change. Increasing the associativity should reduce conflict.