

Q4:- assume we have a computer system with 2 level cache the hit time for L1 cache is 1 cycle and for L2 cache is 10 cycles and the miss penalty is 200 cycles. And assume we have a program with 12000 memory reference with 600 misses in L1 cache and 150 misses in L2 cache. Calculate the Average Memory Access Time (AMAT). **5 marks**

$$L1 \text{ cache miss rate} = \frac{600}{12000} = 0.05$$

$$L2 \text{ cache miss rate} = \frac{150}{600} = 0.25$$

$$AMAT = hit\ time_{L1} + miss\ rate_{L1} \times AMAT_{L2}$$

$$AMAT_{L2} = hit\ time_{L2} + miss\ rate_{L2} \times miss\ penalty$$

$$AMAT_{L2} = 10 + 0.25 \times 200 = 60 \text{ cycles}$$

$$AMAT = 1 + 0.05 \times 60 = 3 \text{ cycles}$$

Q2:- what is the effect of block size on miss rate and miss penalty and the effect of associative on hit time, miss rate. **4 marks**

1. Increase block size will decrease miss rate and will increase miss penalty
2. decrease block size will increase miss rate and will decrease miss penalty
3. higher associative will increase hit time and decrease miss rate
4. lower associative will decrease hit time and increase miss rate