1.)Consider a two level hierarchical memory management with access time of L1 is 20 ns an L2 is 100ns. Hit rate of L1 is 75% an whenever there is a miss in L1 , a block of 2 word will move from L2 to L1 then requested word will be assigned to CUP. What will be the AVG. access time ?



T1=20ns , T2=100ns

H1=75%=.75



TB2=100\*2=200ns



Tavg= H1T1+(1-H1)H2(T1+TB2)



H2=1 (Last level)



Tavg= .75\*20+.25(20+200)



2.) Consider a two level hierarchical memory management where AVG access the without level1 is 200ns and with level1 is 50ns. The level1 access time is 25ns, then what is the hit ratio of level1.



Ans.



T2=200ns



Tavg=50ns



T1=25ns



50=H1\*25+225-225H1



H1=0.75



3.) Consider a three level hierarchal memory with access time 10ns, 50ns, and 150ns. Hit ratio 80%, 90% and 100% respectively. Wherever there is a miss in level1 a block of 4 words will move from L2 to L2 and requested word assigned to CPU, and whenever a miss in L2 a block of 8 words will be moved from L3 to L2 then concerned block will move from L2 to L1 then Requested word is assigned to CPU. What will be the AVG access time?



T1=10ns, TB2=4\*50ns, TB3=150\*8ns



Tavg = 0.8\*10+ 0.2\*0.9\*(10 + 50\*4)+ 0.2\*0.1\*(10 + 50\*4 + 150\*8)



4.) Assume that for a certain processor, a read request takes 50 nanosecond on a cache miss and 5 nanoseconds on a cache hit. Suppose while running a program, it was observed that 80% of the processor's read requests result in a cache hit. The average read access time in nanoseconds is?



Ans.)



Tavg= 0.8\*5+0.2\*50

