Abdurrahman BULUT 190104225x CSE 331 - 503 Final Exam.

I hereby pledge that I will strictly adhere to academic integrity codes and the work done on this examination is solely my own and I will not receive/give any help from/to anybody or source during this examination.

Q2)

index = 7 bits , 2^7 block

32 bytes block size → 2^5 → 5 offset

block size 32 byte

line 4 byte

Index – V – tag – Memory

a) tag = total size – index – offset = 32 – 7 – 5 = 20 bit

1 1110 0101 0110 1110 1011 0001 0011 1000

Index V | tag | block offset

b)

Block Adress	
Index	Tag	Block Offset

block adress = Index + tag

1111 0011 0110 1110 1011 0001 001

c) Set address:

0110 1110 1011 0001 0011 1000

d) 2^7 → index $2^7 \times 2$ → two assoc → $2^8 \times \underbrace{2^5}_{\text{data block}} = 2^{13} = 8$ Kilobytes

e) $AMAT = \text{hit time}_{L1} + \text{Miss rate}_{L1} \times (\text{hit time}_{L2} + \text{Missrate}_{L2} \times \text{Miss penalty}_{L2})$

$4\,ns + 0,1 \times (10\,ns + 0,4 \times 600\,ns)$

$= 4ns + 0,1\,(10+24)$

$= 4 + 0,1\,(34)$

$= 4 + 3,4$

$= 7,4$