Berke Belgin
17104065

2)

Block Size = 32 bytes

Physicle Address width = 33
Index width = 7

a)

Offset width = $\log_2 32 = \underline{5}$

Tag width = $33 - 1 - 7 - 5 = 20$

Tag = 1110 0101 0110 1110 1011

b)

Block Address = 0001 001

c)

Set Address = Block Address Mod Set Size = $11000 \% 2 = \underline{0}$

d)

$32 \cdot 2^7 = 2^{12} = \underline{4KB}$

e)

Hit time$_{L1}$ 4ns
Hit time$_{L2}$ 10ns
miss penalty$_{L2}$ 600ns

$T = \text{Hit time}_{L1} + \text{miss Rate}_{L1} \cdot (\text{Hit time}_{L2} * \text{Miss Rate}_{L2} * \text{Miss Pen.}_{L2})$

Hit Rate$_{L1}$ 90% → Miss Rate$_{L1}$ 10%

Hit Rate$_{L2}$ 60% → Miss Rate$_{L2}$ 40%

$T = 4 + \frac{10}{100} \cdot (10 + 600 \cdot \frac{40}{100}) = 4 + \frac{250}{10} = \underline{29ns}$