0907432 Computer Architecture and Organization 2 (Spring 2022)

Quiz 2A

الاسم: رقم التسجيل:

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Instructions: Time **10** minutes. Open book and notes exam. No electronics. Please answer all problems in the space provided and limit your answer to the space provided. No questions are allowed.

P1. Draw a two-way associative cache with the following specifications: size = 32 KB, block size = 64 bytes, word size = 4 bytes, address width = 32 bits, and write through scheme. Specify the sizes (in bits) of the block offset, index, and tag.

The solution is:

m = 32

n **= lg_2 (block size in bits) = lg_2 (64 × 8 bits) = 9 bits**

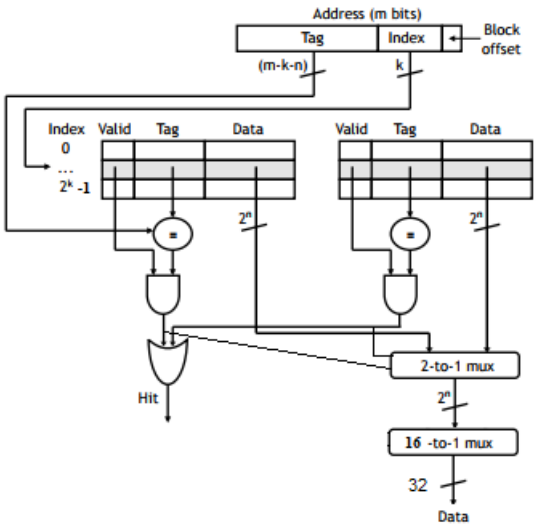
<block offset> **= lg_2 (block size in bytes) = lg_2 (64) = 6 bits**

Number of blocks **= 32 KB / 64 bytes = 512 blocks**

Number of sets **= 512 / 2 = 256 sets**

k = <index> **= lg_2 (No. of sets) = lg_2 (256) = 8 bits**

<tag> **= 32 – <index> – <block offset> = 32 – 8 – 6 = 18 bits**



<Good Luck>