Assignment 2 (submit on 12-02-2019)

Q.1 Consider a fully associative mapped cache of size 16 KB with block size 256 bytes. The size of main memory is 128 KB. Find-

1. Number of bits in tag 2. Tag bits

Q.2 Consider a fully associative mapped cache of size 512 KB with block size 1 KB. There are 17 bits in the tag. Find-

1. Size of main memory 2. Tag bits

Q.3 Consider a fully associative mapped cache with block size 4 KB. The size of main memory is 16 GB. Find the number of bits in tag.

Q.4 A 64KB cache has 16 byte blocks. If addresses are 32 bits, how many bits are used the tag, index, and offset in this cache?
a) if cache is direct mapped
b) if cache is 4-way set associative
c) for fully associative cache

Q.5 Consider a 2-way set associative mapped cache of size 16 KB with block size 256 bytes. The size of main memory is 128 KB. Find-

1. Cache Index 2. Tag bits

Q.6 Consider an 8-way set associative mapped cache of size 512 KB with block size 1 KB. There are 7 bits in the tag. Find-

1. Size of main memory 2. Tag bits

Q.7 Consider a 4-way set associative mapped cache with block size 4 KB. The size of main memory is 16 GB and there are 10 bits in the tag. Find-

1. Size of cache memory 2. Tag bits

Q.8 Consider a 8-way set associative mapped cache. The size of cache memory is 512 KB and there are 10 bits in the tag. Find the size of main memory.

Q.9 Consider a 4-way set associative mapped cache. The size of main memory is 64 MB and there are 10 bits in the tag. Find the size of cache memory.

Q.10 A block-set associative cache memory consists of 128 blocks divided into four block sets. The main memory consists of 16,384 blocks and each block contains 256 eight-bit words.

1. How many bits are required for addressing the main memory?
2. How many bits are needed to represent the TAG, SET and WORD fields?

Q.11 A 4-way set associative cache memory unit with a capacity of 16 KB is built using a block size of 8 words. The word length is 32 bits. The size of the physical address space is 4 GB. The number of bits for the TAG field is _____.