KING FAHD UNIVERSITY OF PETROLEUM & MINERALS

COMPUTER ENGINEERING DEPARTMENT

COE 308-01, Term 982
HW# 3

Cache Organization

Due Date: Monday March 1, 1999

A computer employs a 32 Mbytes main memory and a cache of 16 Kbytes. The main memory is word addressable with each word is 4 bytes. The line size is 8 words. The main memory address is 32-bit.

Q.1. Assume that the cache is direct-mapped.

a) Determine the number of bits in each field of the main memory address. (The address is divided into 3 fields in a direct-mapped cache)

b) In what block of the main memory is address 2002 (number is in decimal).

c) If the content of address 0012B000H is in cache, in what cache location would it be (give answer in decimal)? What is the tag that is stored with the block that contains this address?

Q.2. Repeat Q.1 assuming that the cache is fully associative.

Q.3. Repeat Q.1 assuming that the cache is 4-way set associative.