## COLLEGE OF Engineering – department of computer science

Quiz 2

Name:\_\_\_\_\_\_\_\_\_\_\_\_

**Exercise 1:**

a) A k-way set associative cache is a cache that is represented as sets where each set contains k blocks.

Draw a 3-way set associative cache having 2 sets and a main-memory of 6 blocks and a possible mapping of memory blocks to cache using arrows.

b) Explain briefly two write policies that are used by caches to deal with dirty blocks.

c) Regardless of the mapping scheme that is used, there is always a field called offset.

What is this field used for?

If 1 block is 32 bytes, how many bits would be the offset field?

d) Given one disadvantage of full associative caches over direct-mapped caches.

e) The success of caches is based on the concept of locality. There are different types of localities. Mention one of them and say what does it mean in your own words.

**Exercise 2:**

Assume a direct mapped cache is used.

The format of the main-memory address is as shown here:

tag (4 bits) block (4 bits) offset (4 bits)

1) The block field tells us to which cache block we should refer. What happens if the tag of the address does not match the tag of the cache block?

2) How many bytes is the main memory ?

3) To which cache block and to which byte in the block the following addresses map:

a) 0x 048

b) 0x FEF