Question 1 Which of the following statements are generally true?

Memory hierarchies take advantage of temporal locality.

On a read, the value returned depends on which blocks are in the cache.

Most of the cost of the memory hierarchy is at the highest level.

Most of the cost of the memory hierarchy is at the lowest level.

Question 2 T/F High associativity in a cache reduces compulsory misses.

Question 3Assume a 64KB cache with 16-byte block size and a 32-bit address. What type of a cache would require 16 bits for Tag information?

Fully associative cache. / Directed-mapped cache / 2-way associative cache / 4-way associative cache

Question 4 T/F For a given capacity and block size, a set-associative cache implementation will typically have a lower hit time than a direct-mapped implementation.

Question 5 T/F SRAMs are optimized for storage density.

Question 6 Below is the address field of a direct-mapped cache.

Tag index Offset

31-10 9-6 5-0

What is the cache block size (in words)? [16]

Question 7 T/F TLBs are placed on a special cache memory.

Question 8 Assume a 64KB cache with four-word block size (a word is 4 bytes) and a 32-bit address. If a block has 28 tag bits, what is the type of this cache?

2-way set associative / Direct mapped / Fully associative / 4-way set associative

Question 9 Design a 8-way set associative cache that has 16 blocks and 32 bytes per block. Assume a 32 bit address. How many bits for the byte offset? [5]