

Practice Set 02

1. The memory unit of a computer has 256K words of 32-bit each. The computer has an instruction format with four fields: an operational code field, a mode field to specify one of seven addressing modes, a register address field to specify one of 60 processor registers, and a memory address. Specify the instruction format and the number of bits in each field if the instruction is in one memory word.

2. A digital computer has a memory unit of $64K \times 16$ and a cache memory of 1K words. The cache uses direct mapping with a block size of four words.

- a. How many bits are there in the tag, index, block, and word fields of the address format?
- b. How many bits are there in each word of cache including a valid bit?
- c. How many blocks can the cache accommodate?