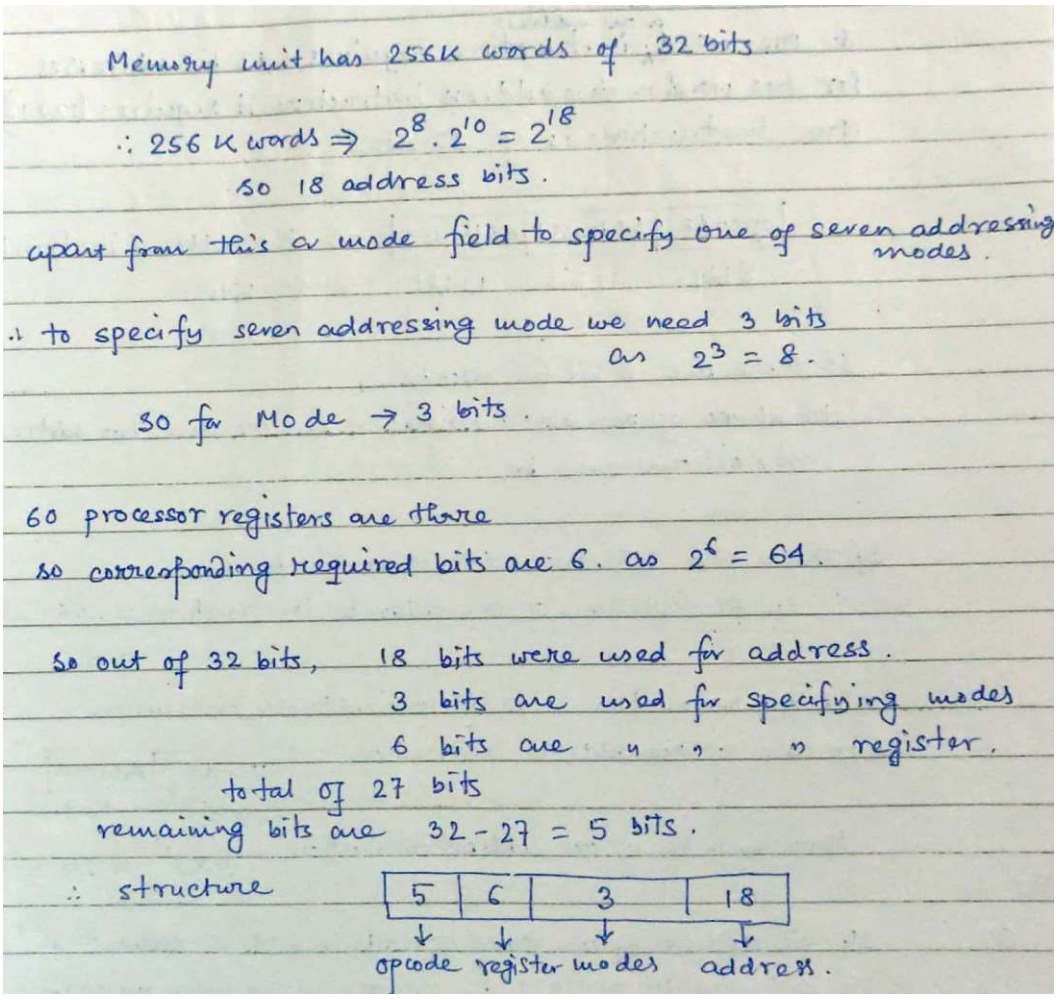
Practice Set 02

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 × 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?