7-1

(a)

Address: 16

Data: 8

(b)

Address: 19

Data: 32

(c)

Address: 26

Data: 64

(d)

Address: 31

Data: 1

7-4

(a)

One RAM cell array:

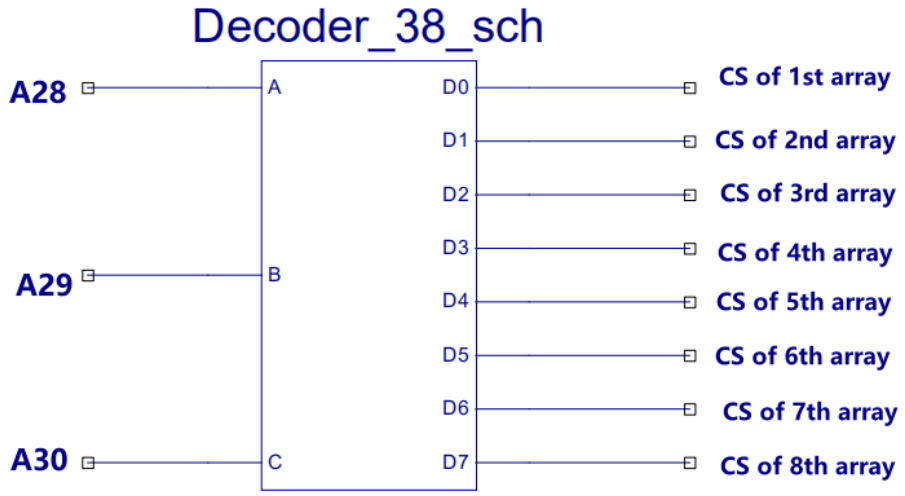
$$2^{14} \times 2^{14} = 2^{28}$$

Then we have:

$$\frac{2G}{2^{28}} = 8$$

So 8 RAM cell arrays are needed.

(b)



7-5

$$2^{15} \times 2^{14} = 2^{29}$$

There are 2^{29} addresses.

7-8

(a)

$$128K \times 6 = 256KB$$
$$\frac{2MB}{256KB} = 8$$

So 8 chips are needed.

(b)

For 2 byte = 1 word:

$$\frac{2MB}{2B} = 2^{20}$$

Also:

$$128K = 2^{17}$$

So 2^{20} address lines are needed, among which 2^{17} address lines are connected to the address inputs of every chip.

(c)

According to **(b)**, 3 address lines must be decoded. The decoder is a 3-to-8 one.