Problem:

Data = 8 bit

Address = 14 bit

Total Memory = 3 kbyte

Chip Size = 512 byte

Design a memory array.

Soln:

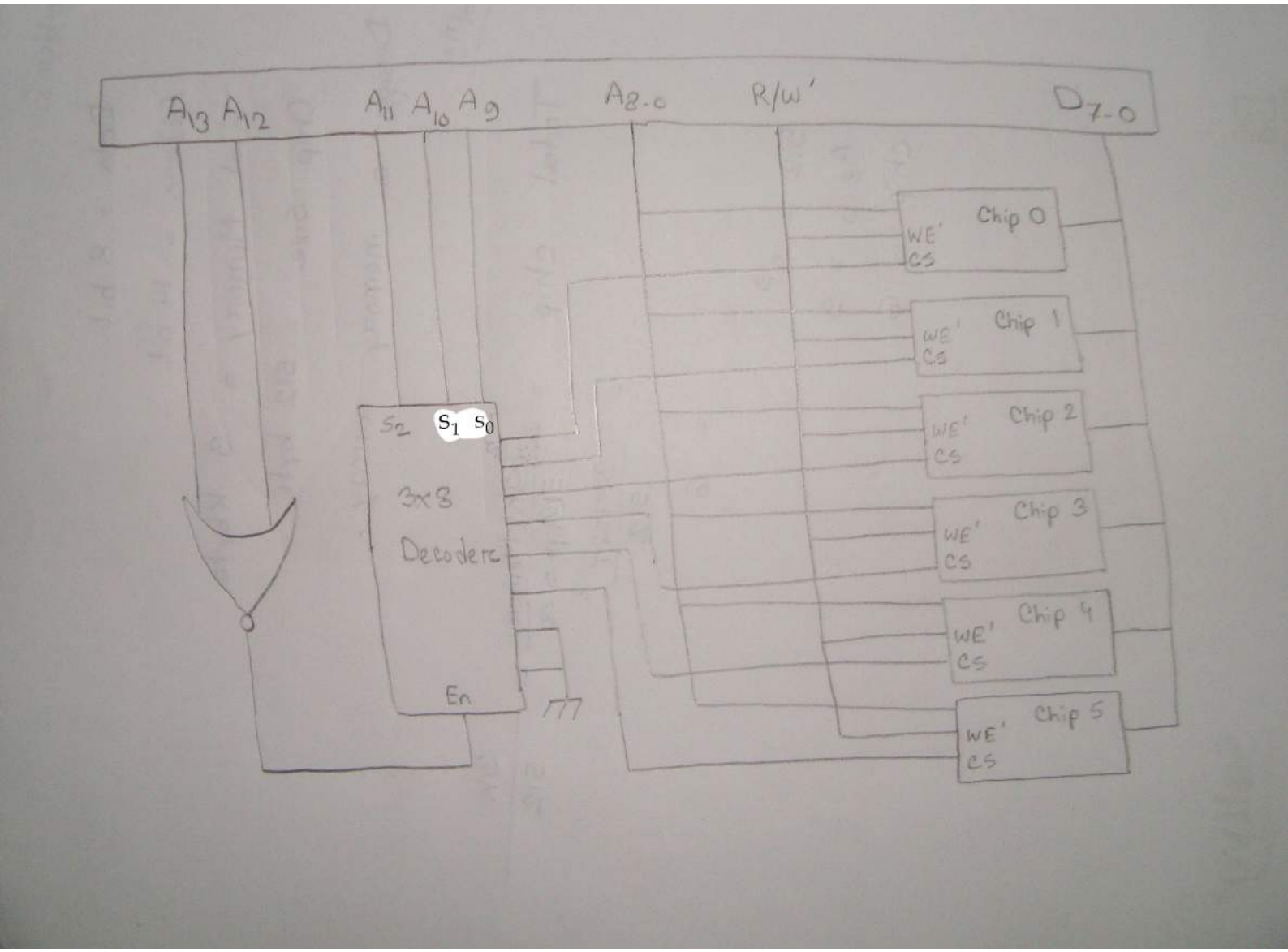
$$\text{Total chip} = \frac{\text{Total Memory}}{\text{chip size}} = \frac{3K}{512}$$

$$= \frac{3 \times 1024}{512}^{2}$$

$$= 6$$

$512 = 2^9$

$A_{8-0} = 9$


A13 A12
A11 A10 A9
A8-0
R/W'
D7-0
Chip 0
WE'
CS
Chip 1
WE'
CS
Chip 2
WE'
CS
Chip 3
WE'
CS
Chip 4
WE'
CS
Chip 5
WE'
CS
S2 S1 S0
3x8
Decoder
En

Problem :

Total Memory = 4 Kbyte

chip size = 1 kb

Data = 8 bit

Address Bit = 16

Design a memory array.

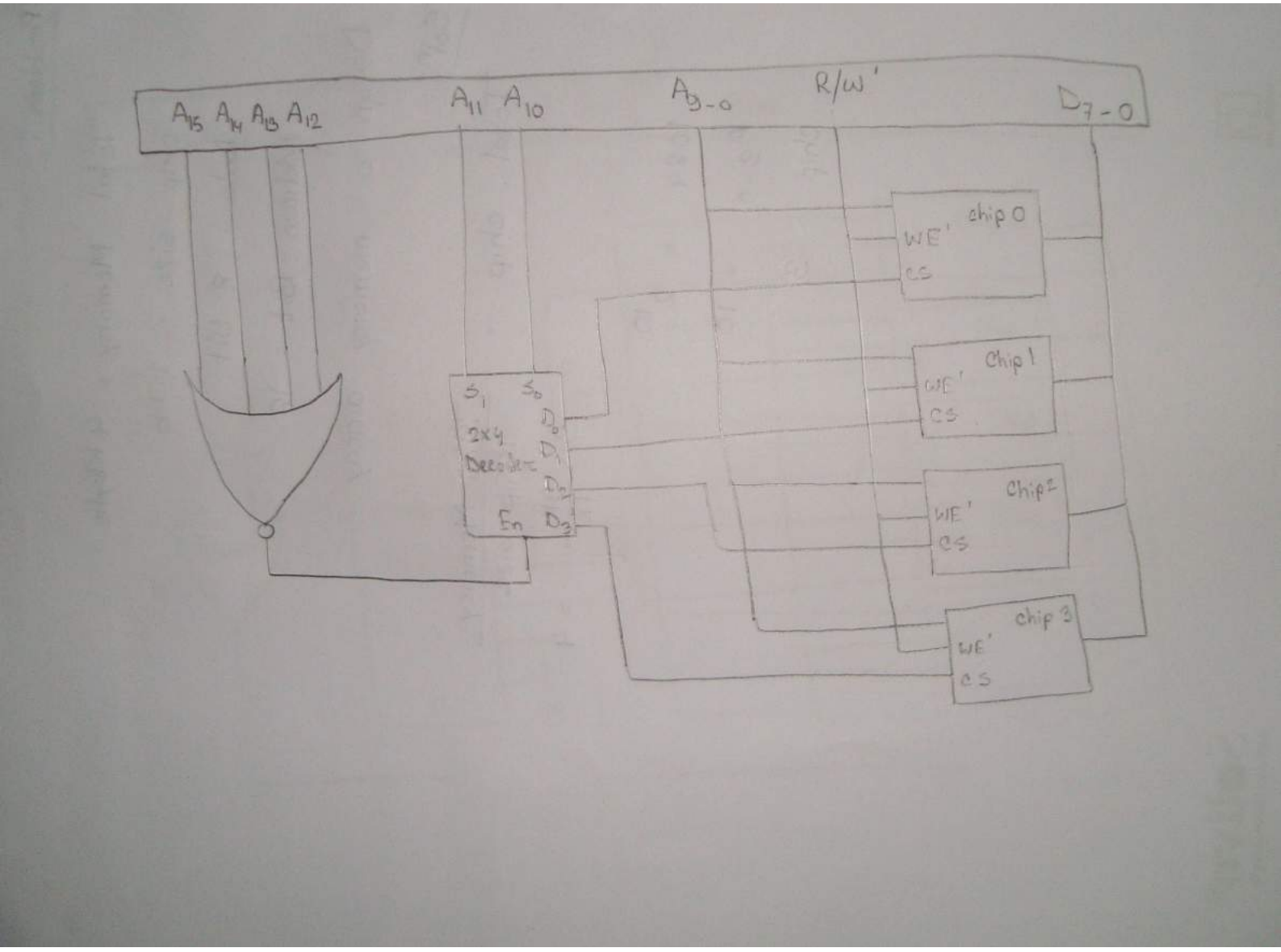
Soln:

$$\text{Total chip} = \frac{\text{Total Memory}}{\text{chip size}}$$

$$= \frac{4K}{1K} = 4$$

$1024 = 2^{10}$

$A_{9-0} = 10$


A15 A14 A13 A12
A11 A10
A9-0
R/W'
D7-0
chip 0
WE'
CS
Chip 1
WE'
CS
Chip 2
WE'
CS
chip 3
WE'
CS
S1 S0
2x4
Decoder
D0
D1
D2
En D3

16 bits processor

Data Bus = 16 bits

Address Bus = 180 bits

chips = 7

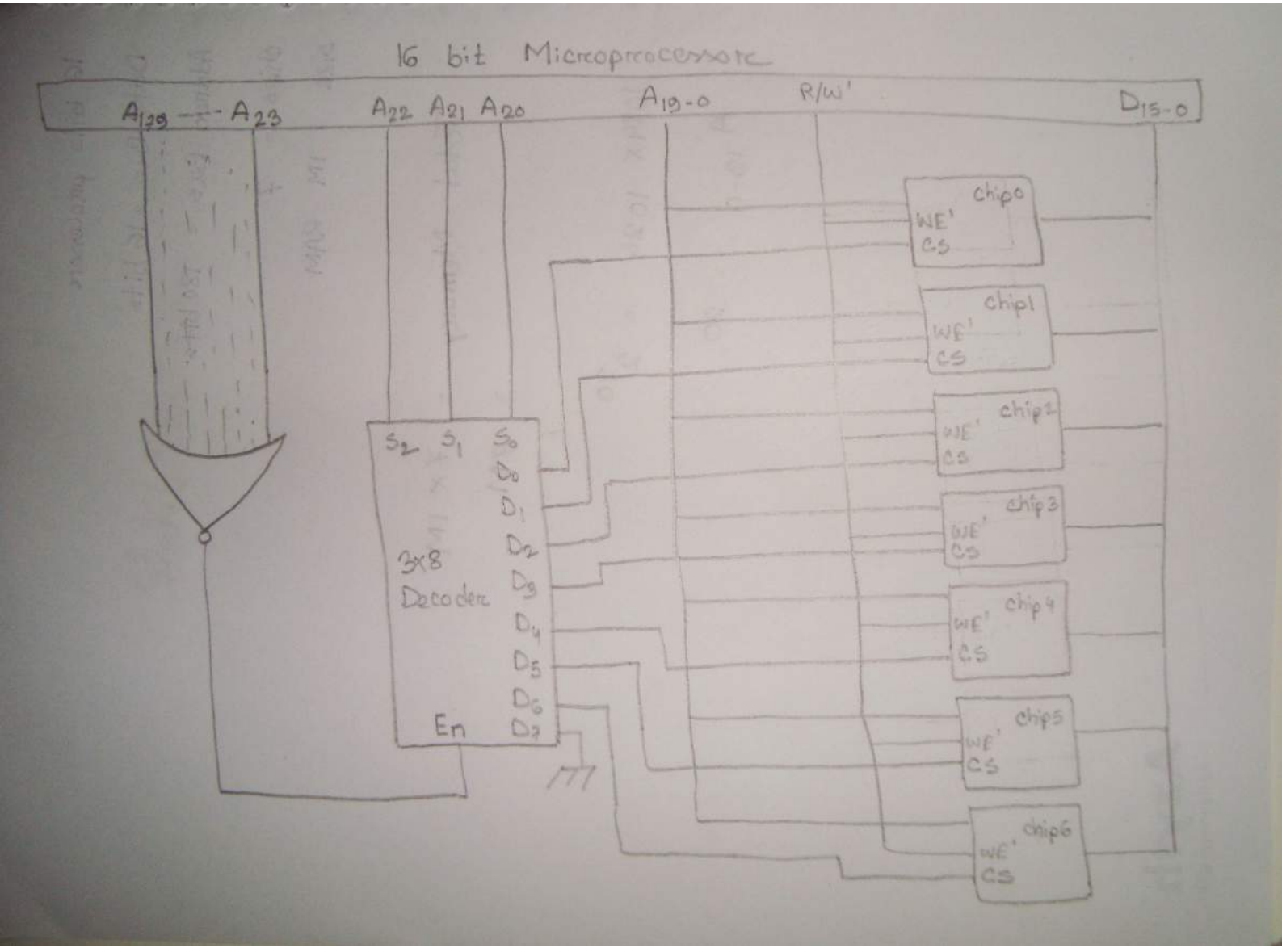
size = 1M RAM

$\therefore$ Total Memory = 7 × 1M

= 7M

$1024 \times 1024 = 2^{20}$

$A_{19-0} = 20$


16 bit Microprocessor
A19-0
R/W'
D15-0
A22 A21 A20
S2 S1 S0
D0
D1
D2
D3
D4
D5
D6
D7
3x8
Decoder
En
chip0
chip1
chip2
chip3
chip4
chip5
chip6
WE'
CS