① A processor can support a max. memory of 4GB where the memory is word-Addressable (2B) The size of address bus of the processor is at least _____ ?

1 word = 2B

Maximum Memory = 4 GB

One Ans:- ~~2^32~~ 2^31

$2^{10} \rightarrow$ Kilo
$2^{20} \rightarrow$ Mega
$2^{30} \rightarrow$ Giga

4GB $\rightarrow$

$= 2^2 \times 2^{30}$ B

$= \frac{2^{32}\ B}{2B} = 2^{31}$ words

31 Address lines, 1B = 2B

Size of the RAM in words ?

Q2) A Computer with a 32 bit wide data bus uses 4K x 8 Static RAM Memory chip, The Smallest memory this Computer can have is _____ ?

Ans1 = 2^{10} why?

32 bit = 2^5 array

Size = 2^{15} why?

Ans2 = 1B why?

4K memory loca.

8 bit each

Smallest → 1B

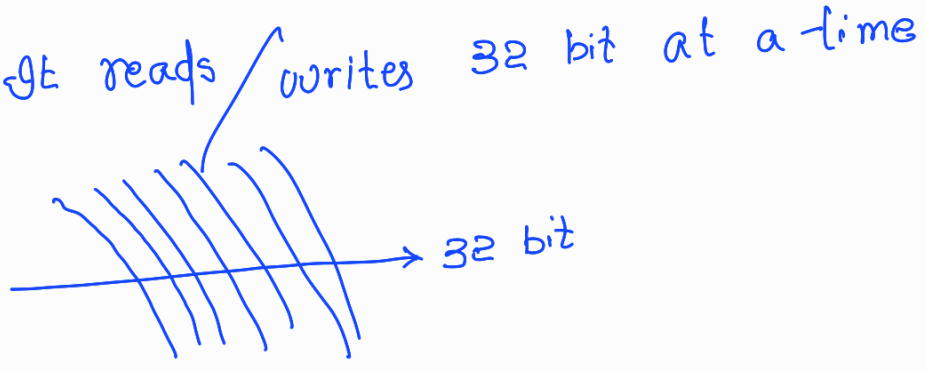
RAM chip size = 4K x 8

4K → Addresses

8 → 8 bit

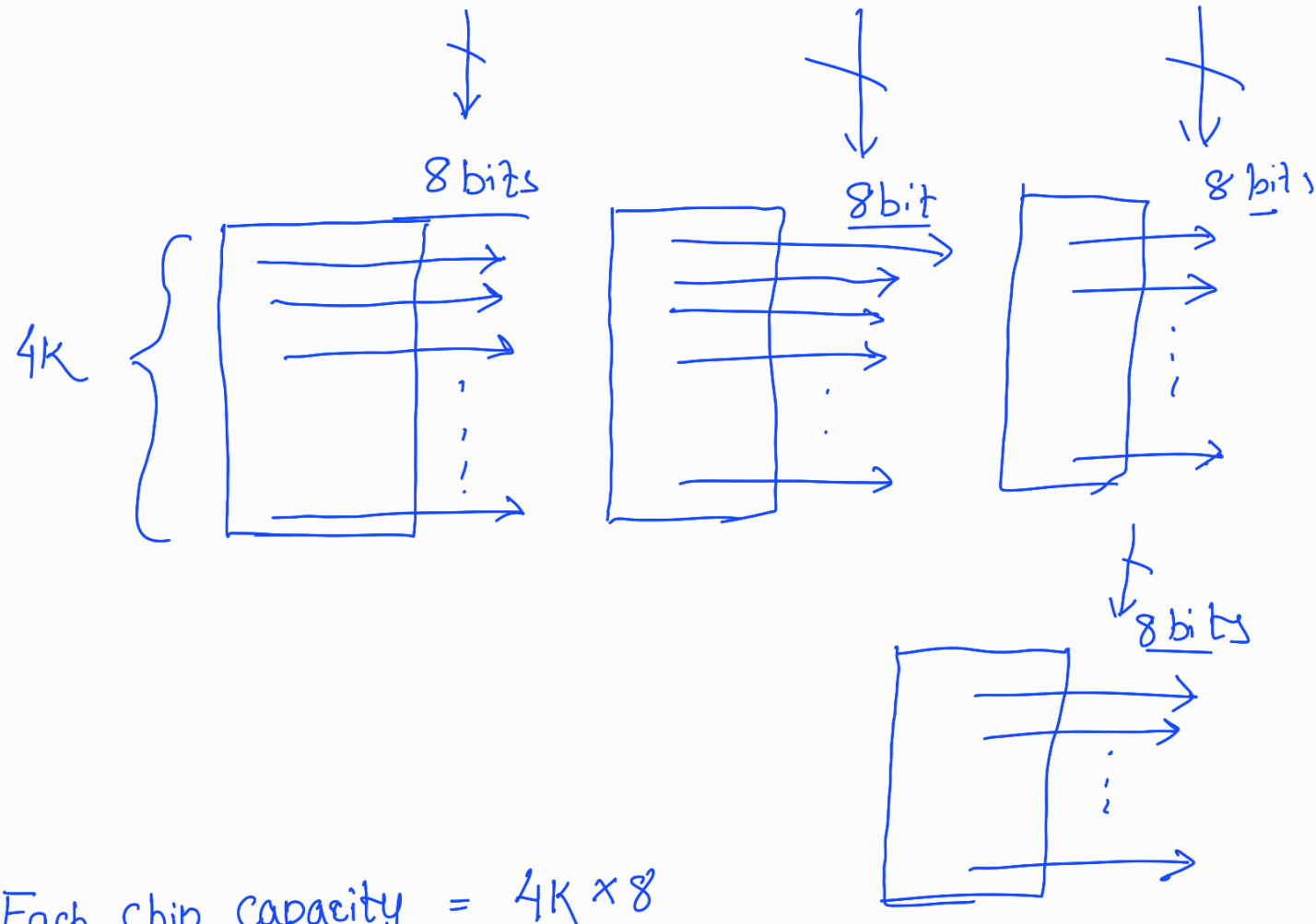
Data bus width = 32 bit

The processor has 32 bit data bus



Each RAM chip provide only = 8 bit

So number of RAM chips require = $\frac{32}{8} = 4$

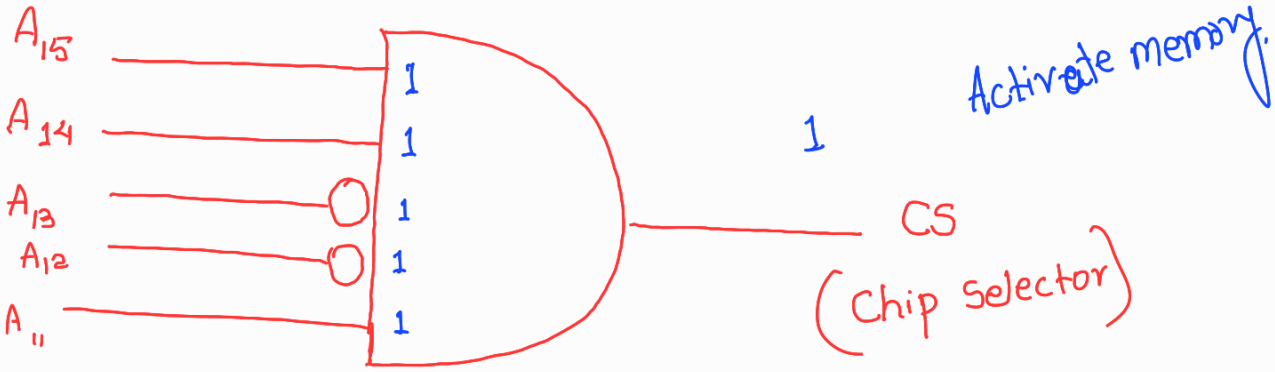


Each chip capacity = $4K \times 8$

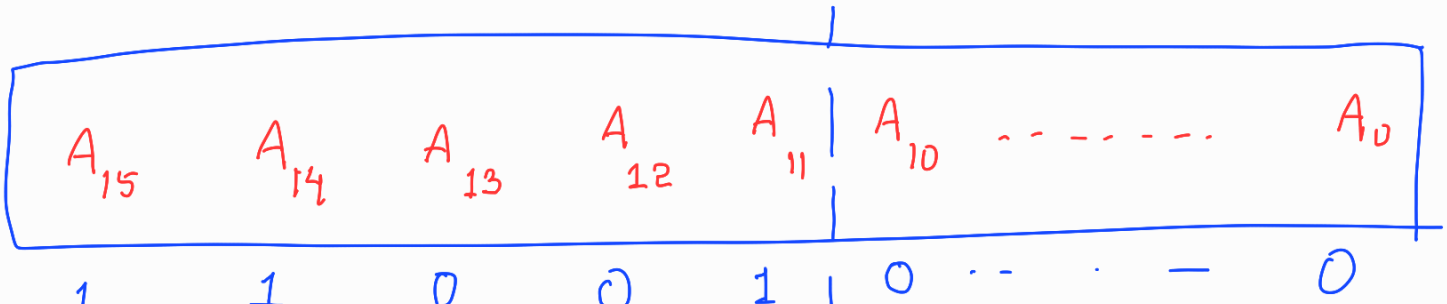
$= 4KB$

$$\boxed{4 \times 4KB = 16KB}$$

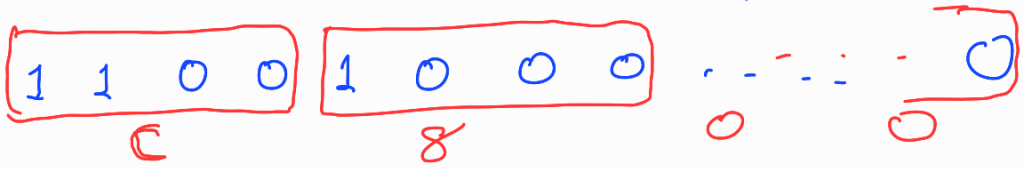
Q3

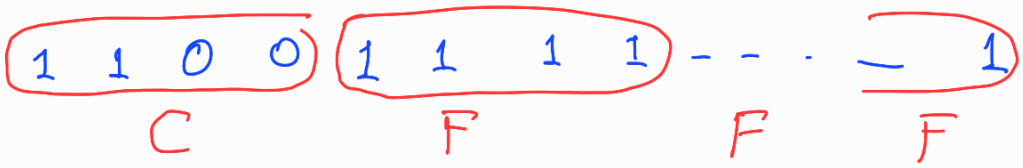


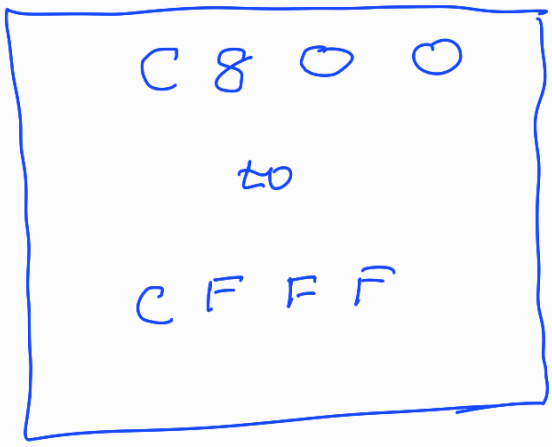
The chip select logic for a certain DRAM chip in Memory design is shown above. Assume the memory System has 16 bit Address line denoted as A_0 to A_{15}. What is the range of the memory system in hex.



(Hard coded)






C 8 0 0
to
C F F F