Quiz -03

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Synchronous counter:

The flip flops within synchronous counters are all clocked at the same time by a common clock pulse.

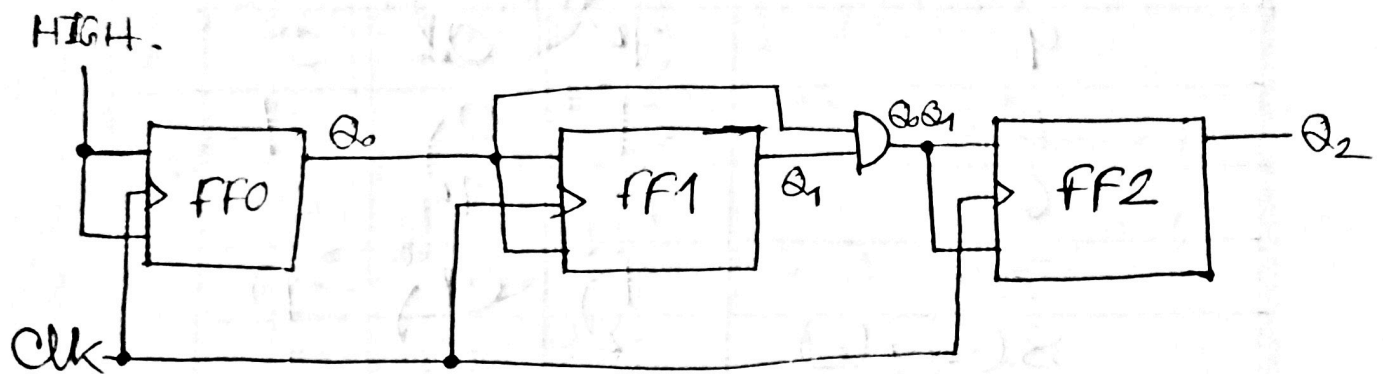Figure : 3-bit synchronous counter.

where, $J_1 = k_1 = Q_0$

$J_2 = k_2 = Q_0 Q_1$

State sequency:

Clock phase	Q_2	Q_1	Q_0
Initially	0	0	0
1	0	0	1
2	0	1	0
3	0	1	1
4	1	0	0
5	1	0	1
6	1	1	0
7	1	1	1
8 (recycles)	0	0	0

Ans to the Q.NO. 03 (a)

(i) 256 k × 32.

Number of words = 256k.

Number of bits per word = 32.

So, in 256k×32 the number of address lines is an obtained number of words. that is,

$$256k = 2^8 \times 2^{10} = 2^{18}$$

Therefore, it requires 18 ~~lines~~ address lines.

∴ The sum of address lines and the number of bits (data lines):

$$18 + 32 = 50.$$

∴ it requires 50 I/O lines.

(Ans).

(ii) 16M × 16.

Number of words = 16M.

Number of bits = 16. (per word).

∴ The number of address line is obtained number of words. that is:

$16M = 2^4 \times 2^{20} = 2^{24}$

∴ it requires 24 address lines.

∴ The sum of address lines and the number of bits:

24 + 16 = 40.

∴ therefore, it requires 40 I/O lines.

(Ans).

(iii). 8k×8.

Number of words = 8.

Number of bits per word = 8.

∴ The number of address line is obtained number of words. that is:

$$8k = 2^3.$$

∴ it requires 3 address lines.

∴ The sum of address lines and the number of bits, that is,

$$3+8 = 11$$

Therefore, it requires 11 I/O lines.
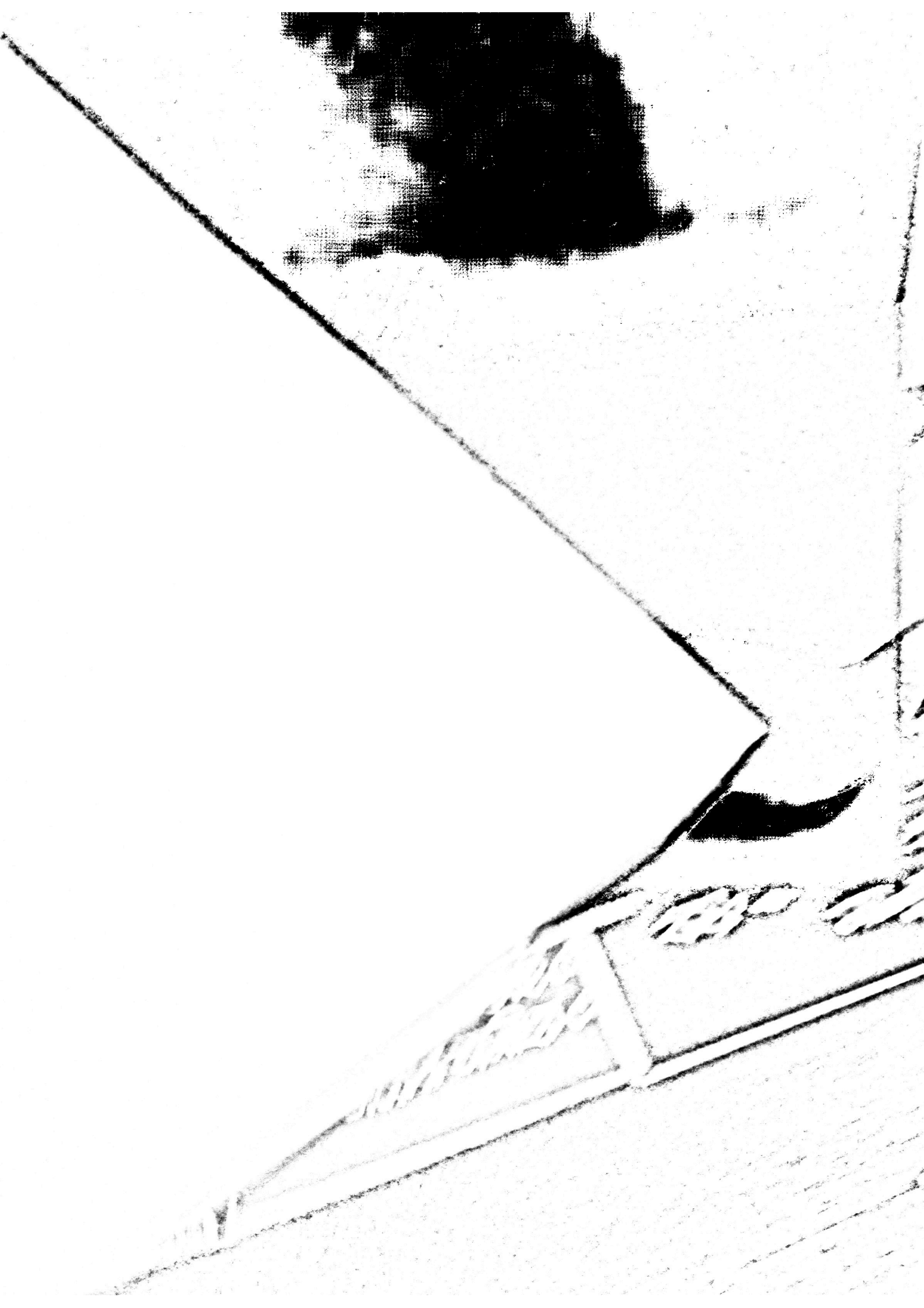
DFF requires 1 bit.

So, No of DFF requires for.

$2^{18} \times 32 =$

$2^{24} \times 16 = 256$ Million DFF

$2^{13} \times 8 = 64k$ DFF.

	W	X	Y	Z
Initial output	0	0	0	0
After T_1	1	0	0	0
After T_2	1	1	0	0

the value of wxyz after

2 succesive cycles is 1100.