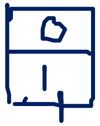
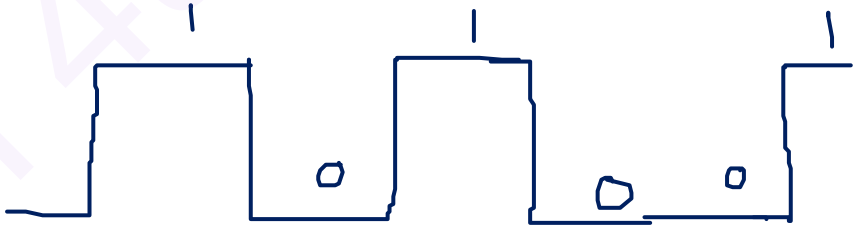
Introduction to Switching Theory and Logic Design

Switching. — OFF (0)
— ON (1)





0 – logic '0' — off

1 – logic '1' — ON.

Logic Design — designing circuits using gates.

gates — Basic
— universal.
— Exclusive.

Number System :-

A decimal number — equivalent binary digits.

(2-bit)

0	—	0 0
1	—	0 1
2	—	1 0
3	—	1 1

$\Longrightarrow$ 4-bit $\Rightarrow$ 0 0 1 1

$2^3 \; 2^2 \; 2^1 \; 2^0$

1st 0th

$2^1 \quad 2^0$

$0 \longrightarrow 0 \times 2^1 + 0 \times 2^0 = 0$

$1 \longrightarrow 0 \times 2^1 + 1 \times 2^0 = 1$

$2 \longrightarrow 1 \times 2^1 + 0 \times 2^0 = 2$

$3 \longrightarrow 1 \times 2^1 + 1 \times 2^0 = 3$

In general, the value of any mixed decimal number is given by

$$d_n d_{n-1} d_{n-2} \cdots\cdots d_1 d_0 \cdot d_{-1} d_{-2} d_{-3} \cdots\cdots d_{-k}.$$

$$\Rightarrow (d_n \times 10^n) + (d_{n-1} \times 10^{n-1}) + (d_{n-2} \times 10^{n-2}) \cdots\cdots d_0 \times 10^0 \cdot (d_{-1} \times 10^{-1})$$

$$+ (d_{-2} \times 10^{-2}) \cdots\cdots$$

For example consider $9256 \cdot 26$

$$= 9000 + 200 + 50 + 6 + 2 \times \left(\frac{1}{10}\right) + 6 \times \left(\frac{1}{100}\right).$$

$$= 9 \times 10^3 + 2 \times 10^2 + 5 \times 10^1 + 6 \times 10^0 + 2 \times 10^{-1} + 6 \times 10^{-2}.$$

another example.

$$6592.69 = 6 \times 10^3 + 5 \times 10^2 + 9 \times 10^1 + 2 \times 10^0 + 6 \times 10^{-1} + 9 \times 10^{-2}$$