

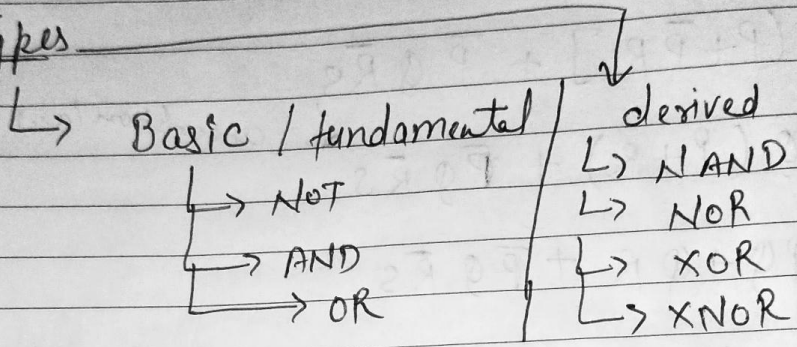
L-16

* Logic gates

gate \rightarrow It will allow or does not allow current to pass through it.

It is used to implement logic function using gates

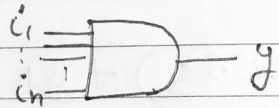
* Types



* AND gate

① n inputs and only '1' output

② Symbol



$$y = i_1 \cdot i_2 \dots i_n$$

③ output of AND gate is '1' if all inputs are '1'

OR

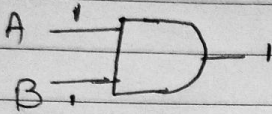
if atleast one input is '0' then out will be 0

4 Truth table

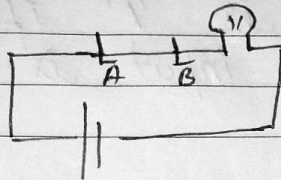
| A | B | $A \cdot B$ |
|---|---|-------------|
| 0 | 0 | 0 |
| 0 | 1 | 0 |
| 1 | 0 | 0 |
| 1 | 1 | 1 |

$$f(A, B) = A \cdot B$$

5 Circuit diagram



1 → Presence of current
0 → Absence " "



~~AND~~ AND gate A.K.A Series circuit

6 How many minterms

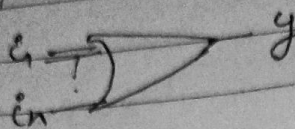
Q → Consider AND function of 'n' boolean variables how many minterms will be present

Ans One minterm

• OR function/gate

① n i/p & o/p is 1

② Symbol



$$y = i_1 + i_2 + i_3 \dots i_n$$

③ output of OR gate is '1' iff atleast one of its input is 1

④ Truth table

| A | B | A+B |
|---|---|-----|
| 0 | 0 | 0 |
| 1 | 0 | 1 |
| 0 | 1 | 1 |
| 1 | 1 | 1 |

$$f(A, B) = (A+B)$$

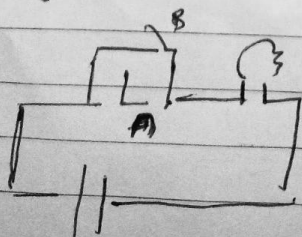
$$\bar{A}B + A\bar{B} + AB$$

$$B + \bar{B}A$$

↓ Absorption law

$$A+B$$

⑤ Circuit diagram



OR AKA parallel circuit

6 How many minterms

n var OR function

2^n

$2^n - 1$ Ans

minterms