**Porta Lógica - Logic Gate AND ou E ou \***

**Porta NOT ou INVERTER (inversor)**

**Porta Lógica - Logic Gate NAND (Não E)**

**Desafio 5 – Tendo em conta a expressão .**

**Desafio 5.1 – Tendo em conta a expressão**

a) Calcular o nº de saídas possíveis.

b) Preencher a tabela de verdade.

c) Desenhar o circuito no logisim.

d) Desenhar o diagrama temporal.

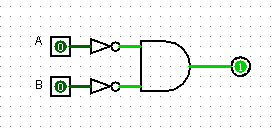
e) Conclusão.

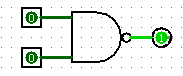
**Resolução**

a) Calcular o nº de saídas possíveis. Resposta 22=\_4\_\_

b) Preencher as tabelas de verdade

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | 22=4 | Entradas | |  | | Saída  **.** | | **A** | **B** |  |  | **S** | | 1 | 0 | 0 | 1 | 1 | 1 | | 2 | 0 | 1 | 1 | 0 | 0 | | 3 | 1 | 0 | 0 | 1 | 0 | | 4 | 1 | 1 | 0 | 0 | 0 | |  | |  |  |  |  |  | | --- | --- | --- | --- | --- | | 22=4 | Entradas | |  | Saída | | **A** | **B** | **A.B** | **S** | | 1 | 0 | 0 | 0 | 1 | | 2 | 0 | 1 | 0 | 1 | | 3 | 1 | 0 | 0 | 1 | | 4 | 1 | 1 | 1 | 0 | |

b) Desenhar os circuitos no logisim.



c) Desenhar os diagramas temporais.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | |  |  |  |  |  |  | | A | 0 | 0 | 1 | 1 |  | |  |  |  |  |  |  | | B | 0 | 1 | 0 | 1 |  | |  |  |  |  |  |  | |  |  |  |  |  |  | | S | 1 | 0 | 0 | 0 |  | |  | |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | |  |  |  |  |  |  | | A | 0 | 0 | 1 | 1 |  | |  |  |  |  |  |  | | B | 0 | 1 | 0 | 1 |  | |  |  |  |  |  |  | |  |  |  |  |  |  | | S | 1 | 1 | 1 | 0 |  | |

f) Conclusão. Conclui-se que, negar as entradas de uma porta produz um resultado diferente ao de negar a saída de uma mesma porta.