**Comprove que a expressão** $A.\overline{B}+\overline{A}.B$ **Equivale à porta XOR**

**Porta Lógica - Logic Gate XOR** $⊕$

**Porta NOT ou INVERTER (inversor)**

**Porta Lógica - Logic Gate OR ou OU ou +**

**Desafio 7 – Tendo em conta a expressão** $S=A.\overline{B}+\overline{A}.B$

**Desafio 7.1 – Tendo em conta a expressão**  $S=A⊕B$

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=\_\_\_\_

b) Preencher as tabelas de verdade

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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| 22=4 | Entradas |  |  |  | Saída$$A.\overline{B}+\overline{A}.B$$ |
| **A** | **B** | $$\overline{A}$$ | $$\overline{B}$$ | $$A.\overline{B}$$ | $$\overline{A}.B$$ | **S** |
| 1 | 0 | 0 | 1 | 1 | 0 | 0 | 0 |
| 2 | 0 | 1 | 1 | 0 | 0 | 1 | 1 |
| 3 | 1 | 0 | 0 | 1 | 1 | 0 | 1 |
| 4 | 1 | 1 | 0 | 0 | 0 | 0 | 0 |

 |  |

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

 |



b) Desenhar os circuitos no logisim (Teste os circuitos com entradas iguais).

c) Desenhar os diagramas temporais.

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

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

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f) Conclusão. $S=A.\overline{B}+\overline{A}.B$ **é igual a** $S=A⊕B$. Também conhecida como a **porta ou exclusivo**. A saída só é 1 quando as entradas forem diferentes.