**EDERSON CRISTIANO NUNES – 438964**

**ARQUITETURA DE COMPUTADORES**

**AC1 – AVALIAÇÃO SOMATIVA 01**

1. PROJETAR um circuito binário com portas lógicas capaz de produzir as seguintes saídas.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | abcd | saidas | s2 | s1 | s0 |
| 0 | 0000 | 2 | 0 | 1 | 0 |
| 1 | 0001 | 1 | 0 | 0 | 1 |
| 2 | 0010 | 1 | 0 | 0 | 1 |
| 3 | 0011 | 1 | 0 | 0 | 1 |
| 4 | 0100 | 4 | 1 | 0 | 0 |
| 5 | 0101 | 2 | 0 | 1 | 0 |
| 6 | 0110 | 1 | 0 | 0 | 1 |
| 7 | 0111 | 1 | 0 | 0 | 1 |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | abcd | saidas | s2 | s1 | s0 |
| 8 | 1000 | 4 | 1 | 0 | 0 |
| 9 | 1001 | 4 | 1 | 0 | 0 |
| 10 | 1010 | 2 | 0 | 1 | 0 |
| 11 | 1011 | 1 | 0 | 0 | 1 |
| 12 | 1100 | 4 | 1 | 0 | 0 |
| 13 | 1101 | 4 | 1 | 0 | 0 |
| 14 | 1110 | 4 | 1 | 0 | 0 |
| 15 | 1111 | 2 | 0 | 1 | 0 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| s2 | 00 | 01 | 11 | 10 |  | s1 | 00 | 01 | 11 | 10 |  | s0 | 00 | 01 | 11 | 10 |
| ab\cd |  |  |  |  |  | ab\cd |  |  |  |  |  | ab\cd |  |  |  |  |
| 00 | 0 | 0 | 0 | 0 |  | 00 | 1 | 0 | 0 | 0 |  | 00 | 0 | 1 | 1 | 1 |
| 01 | 1 | 0 | 0 | 0 |  | 01 | 0 | 1 | 0 | 0 |  | 01 | 0 | 0 | 1 | 1 |
| 11 | 1 | 1 | 0 | 1 |  | 11 | 0 | 0 | 1 | 0 |  | 11 | 0 | 0 | 0 | 0 |
| 10 | 1 | 1 | 0 | 0 |  | 10 | 0 | 0 | 0 | 1 |  | 10 | 0 | 0 | 1 | 0 |

1. SoP(4,8,9,12,13,14)

(a’.b.c’.d’)+(a.b’.c’.d’)+(a.b’.c’.d)+(a.b.c’.d’)+(a.b.c’.d)+(a.b.c.d’)

1. PoS(1,2,3,4,6,7,8,9,11,12,13,14)
2. SoP(1,2,3,6,7,11)

(a’.b’.c’.d)+(a’.b’.c.d’)+ (a’.b’.c.d)+(a’.b.c.d’)+ (a’.b.c.d)+(a.b’.c.d)

1. (14,12) = (a.b.d’)

(4,12) = (b.c’.d’)

(8,9,12,13) = (a.c’)

S2 = (a.c’)+(a.b.d’)+(b.c’.d’)

1. 0 = (a’.b’.c’.d’)

5 = (a’.b.c’.d)

15 = (a.b.c.d)

10 = (a.b’.c.d’)

s1 = (a’.b’.c’.d’)+(a’.b.c’.d)+(a.b.c.d)+(a.b’.c.d’)

1. (11,3) = (b’.c.d)

(1,3) = (a’.b’.d)

(2,3,6,7) = (a’.c)

S0 = (a’.c)+(b’.c.d)+(a’.b’.d)

1. (a.c’)+(a.b.d’)+(b.c’.d’)

(a.c’)+ (a.c’)+(b.d’)

1. (a’.b’.c’.d)+(a’.b.c’.d)+(a.b.c.d)+(a.b’.c.d’)= (a’+c’)+(b’.d+b.d)+(a+c)+(b.d+b’.d’)

(a’+c’)+d+(a+c).(b.d(+)b’.d’)

1. (a’.b’.c.d)+(a’.b’.c’.d)+(a’.b’.c.d)+(a’.b.c.d)+(a’.b.c.d’)+(a.b’.c.d)

(a’.b’).(c.d+c’.d)+(a’.c).(b’.d+b.d) +c(a’.b.d’+a.b’.d)

((a’.b’).d)+((a’.c).d)+c(a’.b.d’+a.b’.d)

(a’.b’.d)+(a’.c.d)+c(a’.b.d’+a.b’.d)=(a’.d)(b’+c)+c(a’.b.d’+a.b’.d)

(a’.d)(b’+c)+c(a’.b.d’)+(a.b’.d)