

① Aufgabe



a) Wahrheitstabelle:

a	b	\bar{a}	\bar{b}	y
0	0	1	1	0
0	1	1	0	1
1	0	0	1	1
1	1	0	0	1

Boolesche Gleichung: $y = \bar{a} + \bar{b} = \overline{a \cdot b} = a + b$

b) De Morgan $\overline{a \cdot b} = \bar{a} + \bar{b}$

c) Wenn eine offen \rightarrow liegt immer "drüben" da andere an $0 + \bar{x} = \bar{x} = x \rightarrow$ offener Eingang = 1 (oder Strompfundlinie)

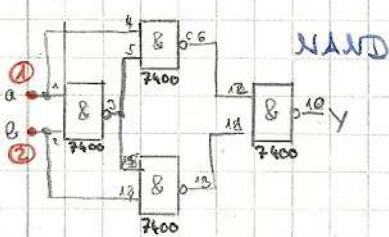
② Aufgabe

EXOR-Funktion $y = a \oplus b = \bar{a}b + a\bar{b} = \overline{\bar{a}b + a\bar{b}}$

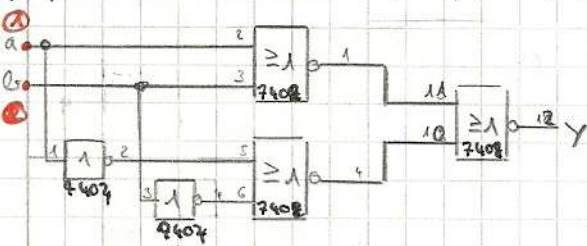
a	b	y
0	0	0
0	1	1
1	0	1
1	1	0

bausteine 1x a) $y = a \oplus b = \bar{a}b + a\bar{b} = \overline{\bar{a}b + a\bar{b}} = \overline{\overline{\bar{a}b} \cdot \overline{a\bar{b}}} = \overline{a + b} = \bar{a} \cdot \bar{b}$

\rightarrow da $\overline{a \cdot b} = \bar{a} + \bar{b} = a + (\bar{a} + \bar{b}) = a + \overline{a \cdot b}$



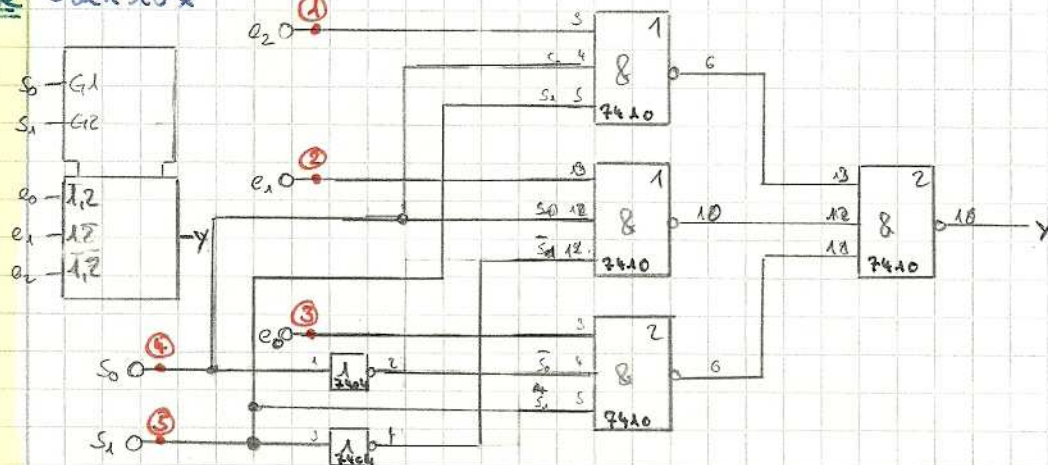
bausteine 2x b) $y = a \oplus b = \bar{a}b + a\bar{b} = (\bar{a} + b)(a + \bar{b}) = \overline{\overline{\bar{a} + b} \cdot \overline{a + \bar{b}}} = \overline{(\bar{a} + \bar{b}) + (a + b)}$



③ Aufgabe

3 und 20x

bausteine 3x
7410 2x
7404



s_0	s_1	A
0	0	0
0	1	e_0
1	0	e_1
1	1	e_2

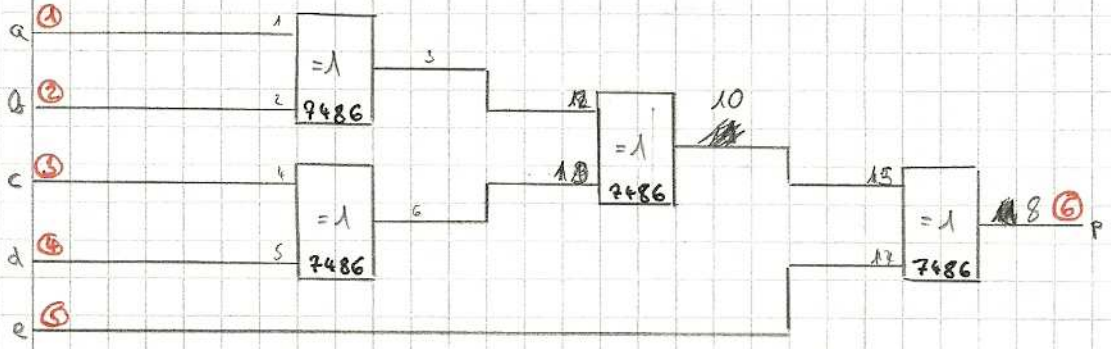
④ Aufgabe TTL 7486 (4 Paare XOR) → 5 Bit-Codewort → Invertierte = 1

1x 7486 XOR → a, b → 5 Bit → a, b, c, d, e

a	b	y
0	0	1
0	1	1
1	0	1
1	1	0

$$(a \oplus b) \oplus (c \oplus d) \oplus e = p$$

$\underbrace{\hspace{2cm}}_s \oplus \underbrace{\hspace{2cm}}_s \oplus e = p$



⑤ Aufgabe 7-Segment Code → 2 Stufige NAND

	s_0	s_1	s_2	a	b	c	d	e	f	g
0	0	0	0	0	0	0	0	0	0	0
1	0	0	1	0	1	1	0	0	0	0
2	0	1	0	1	1	0	1	1	0	1
3	0	1	1	1	1	1	1	1	1	0
4	1	0	0	0	1	1	0	0	0	0
5	1	0	1	1	1	0	1	1	0	1
6	1	1	0	1	1	1	1	0	0	1
7	1	1	1	0	1	1	0	0	1	1

a)
$$a = \overline{s_0} + \overline{s_2}s_1 + s_2\overline{s_1}$$

$$= s_0 (\overline{s_2}s_1) (\overline{s_2}\overline{s_1})$$

b)
$$b = \overline{s_1} + s_2s_1$$

c)
$$c = \overline{s_2} + s_1 = \overline{s_2} + \overline{s_1}$$

d)
$$d = \overline{s_0} + \overline{s_2}s_1 + s_2\overline{s_1}$$

$$= s_0 (\overline{s_2}\overline{s_1}) (\overline{s_2}s_1)$$

$$= a$$

e)
$$e = \overline{s_0} + s_2\overline{s_1}$$

$$= s_0 (\overline{s_2}\overline{s_1})$$

f)
$$f = \overline{s_2}\overline{s_1}$$

g)
$$g = s_1s_0 + s_2s_0 = \overline{s_1}\overline{s_0} \overline{s_2}\overline{s_0}$$

Wiederholung
 7410
 7400-2x

- ① $\overline{s_2 s_1}$
 - ② $\overline{s_1 s_1}$
 - ③ $\overline{s_2 s_1}$
 - ④ $\overline{s_1 s_0}$
 - ⑤ $\overline{s_2 s_0}$
- $\overline{s_0 s_1 s_1 s_2 s_1} 2x$
 $\overline{s_0 s_2 s_1}$
 $\overline{s_1 s_0 s_2 s_0}$
 $\overline{s_2 s_1}$

Bausteine
 8ED's

