384.047 Digitale Systeme Übung – Lösungen

Weiterführende Übungen 1

Schaltnetz 1

a	0	1	0	1	0	1	0	1
b	0	0	1	1	0	0	1	1
c	0	0	0	0	1	1	1	1
x	1	0	1	0	1	0	1	0
y	0	0	1	1	1	1	1	1
f	**1**	**1**	**0**	**1**	**0**	**1**	**0**	**1**

$$f = (\overline{a} \,\&\, \overline{b} \,\&\, \overline{c}) \vee (a \,\&\, \overline{b} \,\&\, \overline{c}) \vee (a \,\&\, b \,\&\, \overline{c}) \vee (a \,\&\, \overline{b} \,\&\, c) \vee (a \,\&\, b \,\&\, c)$$

Schaltnetz 2

a	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1
b	0	0	1	1	0	0	1	1	0	0	1	1	0	0	1	1
c	0	0	0	0	1	1	1	1	0	0	0	0	1	1	1	1
d	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1
u	0	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1
x	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0
w	0	0	0	1	1	1	1	1	0	0	0	1	1	1	1	1
y	0	0	0	0	1	1	1	1	0	0	0	0	1	1	1	1
f	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**1**	**0**

$$f = (\overline{a} \,\&\, \overline{b} \,\&\, c \,\&\, d) \vee (\overline{a} \,\&\, b \,\&\, c \,\&\, d)$$

KV-Diagramme 1

$$f1 = (\overline{b} \,\&\, d) \vee (\overline{c} \,\&\, d) \vee (b \,\&\, c \,\&\, \overline{d}) \vee (a \,\&\, \overline{b} \,\&\, \overline{c}) \vee (\overline{a} \,\&\, b \,\&\, \overline{d})$$

Alternative: $f1 = (\overline{b} \,\&\, d) \vee (\overline{c} \,\&\, d) \vee (b \,\&\, c \,\&\, \overline{d}) \vee (a \,\&\, \overline{b} \,\&\, \overline{c}) \vee (\overline{a} \,\&\, b \,\&\, \overline{c})$

$$f2 = (\overline{b} \,\&\, \overline{d}) \vee (\overline{a} \,\&\, \overline{c}) \vee (a \,\&\, b \,\&\, c)$$

$$f3 = (\overline{b} \,\&\, c) \vee a \vee (c \,\&\, d)$$

$$f4 = (\overline{a} \,\&\, \overline{b} \,\&\, \overline{d}) \vee (a \,\&\, c \,\&\, d) \vee (\overline{a} \,\&\, b \,\&\, d) \vee (a \,\&\, b \,\&\, \overline{c} \,\&\, \overline{d})$$

KV-Diagramme 2

$$f1 = \overline{a} \vee (\overline{b} \,\&\, c)$$

$$f2 = (\overline{b} \,\&\, c) \vee (b \,\&\, \overline{c})$$

$$f3 = (\overline{a} \,\&\, \overline{b}) \vee (\overline{b} \,\&\, \overline{c})$$

$$f4 = \overline{b} \vee \overline{c}$$