

## 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

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

#### Schaltnetz 2

a	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1		
b	0	0	1	1	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	1	1	1	1
d	0	0	0	0	0	0	0	0	1	1	1	1	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	0	0	0	1
x	1	0	1	0	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	1	1	1	1
y	0	0	0	0	1	1	1	1	0	0	0	0	1	1	1	1	1	1	1	1
f	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1	0	1	0

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

#### KV-Diagramme 1

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

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

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

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

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

#### KV-Diagramme 2

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

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

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

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