



Technische Informatik I im WS 2004/2005

Musterlösungen zum 5. Übungsblatt

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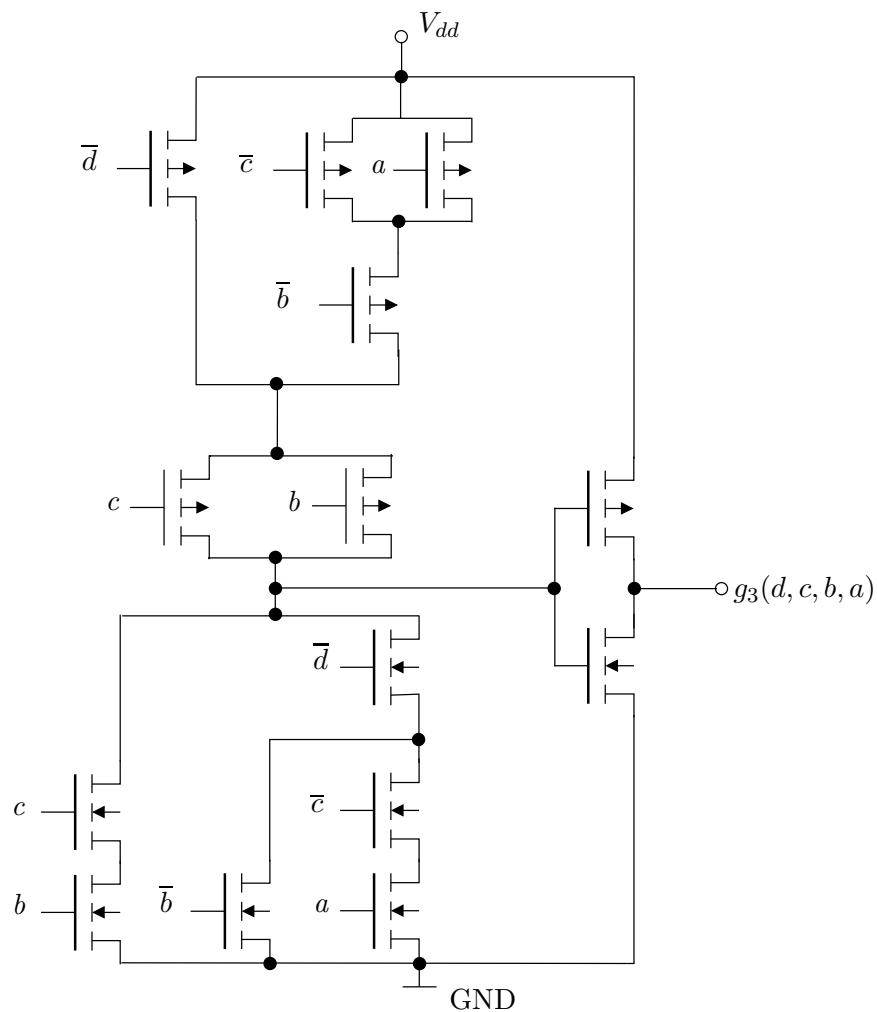
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Lösung 1

1. CMOS-Transistorschaltung von $g(c, b, a)$:

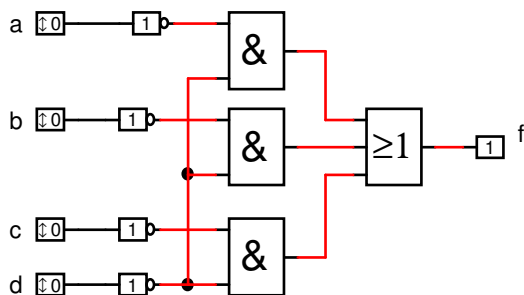
$$g_3(d, c, b, a) = c b \vee \bar{d} \bar{b} \vee \bar{d} \bar{c} a = c b \vee \bar{d} (\bar{b} \vee \bar{c} a)$$



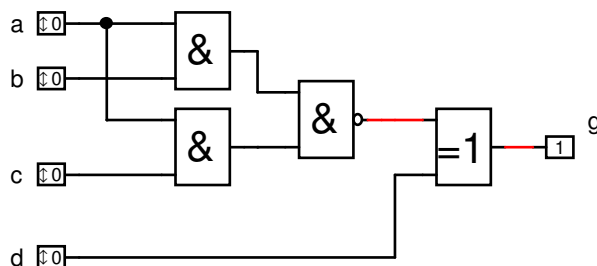
2. CMOS-Transistorschaltung ist nicht geeignet, weil die Belegung $b a = 11$ zu einem Kurzschluß führt.

Lösung 2

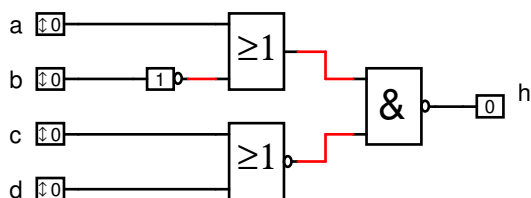
1.



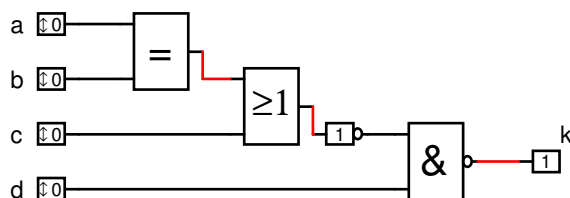
2.



3.

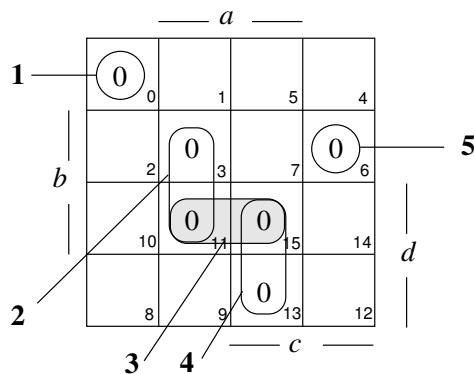


4.



Lösung 3

1. KV-Diagramm:



Die Primimplikate sind:

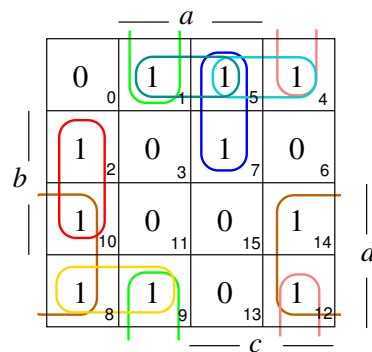
1. $(d \vee c \vee b \vee a)$ 2. $(c \vee \bar{b} \vee \bar{a})$ 3. $(\bar{d} \vee \bar{b} \vee \bar{a})$ 4. $(\bar{d} \vee \bar{c} \vee \bar{a})$
 5. $(d \vee \bar{c} \vee \bar{b} \vee a)$

2. Konjunktive Minimalformen: es existiert nur eine KMF und sie lautet:

$$y_{KMF} = 1 \wedge 2 \wedge 4 \wedge 5$$

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

3. KV-Diagramm:



Die Primimplikanten sind:

$$\begin{array}{l} \overline{d} \overline{b} a \\ \overline{c} b \overline{a} \end{array}$$

$$\begin{array}{l} \overline{c} \overline{b} a \\ d \overline{c} \overline{b} \end{array}$$

$$\begin{array}{l} \overline{d} c \overline{b} \\ \overline{d} c a \end{array}$$

$$\begin{array}{l} c \overline{b} \overline{a} \\ d \overline{a} \end{array}$$

4. Disjunktive Minimalformen:

$$f_{DMF_1} = \overline{c} \overline{b} a \vee \overline{d} c \overline{b} \vee \overline{c} b \overline{a} \vee \overline{d} c a \vee d \overline{a}$$

$$f_{DMF_2} = \overline{c} \overline{b} a \vee c \overline{b} \overline{a} \vee \overline{c} b \overline{a} \vee \overline{d} c a \vee d \overline{a}$$