

Digitaltechnik - Übung 3

1.a

$$\begin{aligned} 1. \quad Z &= (A \wedge \overline{B \wedge C}) \vee A \vee (B \wedge C) \\ &= A \vee ((A \vee (B \wedge C)) \wedge (\overline{B \wedge C} \vee (B \wedge C))) \\ &= A \vee (A \vee (B \wedge C)) \\ &= A \vee (B \wedge C) \end{aligned}$$

$$\begin{aligned} 2. \quad Z &= (A \wedge \overline{B \wedge C}) \vee (A \wedge \overline{\overline{B} \vee \overline{C}}) \\ &= (A \wedge \overline{B \wedge C}) \vee (A \wedge B \wedge C) = A \end{aligned}$$

$$\begin{aligned} 3. \quad Z &= (A \wedge (B \vee C)) \vee (A \wedge \neg C) \\ &= A \wedge ((B \vee C) \vee \neg C) \\ &= A \end{aligned}$$

$$\begin{aligned} 4. \quad Z &= ((B \wedge \neg C) \wedge (A \vee \neg A)) \vee ((\neg B \wedge C) \wedge (A \vee \neg A)) \\ &= (B \wedge \neg C) \vee (\neg B \wedge C) \end{aligned}$$

$$\begin{aligned} 5. \quad &(A \wedge (D \vee (\neg D \wedge \neg C) \vee (C \wedge \neg D))) \vee ((B \wedge C) \wedge (D \vee \neg A)) \\ &A \vee ((B \wedge C) \wedge (D \vee \neg A)) \\ &(A \vee (B \wedge C)) \wedge ((A \vee D) \vee (A \vee \neg A)) \\ &A \vee (B \wedge C) \end{aligned}$$