

$$\begin{aligned} V_{1,1} &= \bigwedge_{i=1}^3 V_{1i,1} \\ V_{1,2} &= \bigwedge_{i=1}^3 (V_{1i,2} \vee (V_{1i,1} \oplus V_{1,1})) \\ V_{1,3} &= \bigwedge_{i=1}^3 (V_{1i,3} \vee (V_{1i,2} \oplus V_{1,2}) \vee (V_{1i,1} \oplus V_{1,1})) \end{aligned}$$

$$\begin{aligned} V_{1i,1} &= \bigvee_{j=1}^3 V_{1ij,1} \\ V_{1i,2} &= \bigvee_{j=1}^3 (V_{1ij,2} \wedge \neg(V_{1ij,1} \oplus V_{1i,1})) \\ V_{1i,3} &= \bigvee_{j=1}^3 (V_{1ij,3} \wedge \neg(V_{1ij,2} \oplus V_{1i,2}) \wedge \neg(V_{1ij,1} \oplus V_{1i,1})) \end{aligned}$$

$$\begin{aligned} V_{1ij,1} &= \bigwedge_{k=1}^3 V_{1ijk,1} \\ V_{1ij,2} &= \bigwedge_{k=1}^3 (V_{1ijk,2} \vee (V_{1ijk,1} \oplus V_{1ij,1})) \\ V_{1ij,3} &= \bigwedge_{k=1}^3 (V_{1ijk,3} \vee (V_{1ijk,2} \oplus V_{1ij,2}) \vee (V_{1ijk,1} \oplus V_{1ij,1})) \end{aligned}$$

$$\begin{aligned} V_{1,1} &\leftrightarrow \bigwedge_{i=1}^3 V_{1i,1} \wedge \\ V_{1,2} &\leftrightarrow \bigwedge_{i=1}^3 (V_{1i,2} \vee (V_{1i,1} \oplus V_{1,1})) \wedge \\ V_{1,3} &\leftrightarrow \bigwedge_{i=1}^3 (V_{1i,3} \vee (V_{1i,2} \oplus V_{1,2}) \vee (V_{1i,1} \oplus V_{1,1})) \wedge \\ V_{1i,1} &\leftrightarrow \bigvee_{j=1}^3 V_{1ij,1} \wedge \\ V_{1i,2} &\leftrightarrow \bigvee_{j=1}^3 (V_{1ij,2} \wedge \neg(V_{1ij,1} \oplus V_{1i,1})) \wedge \\ V_{1i,3} &\leftrightarrow \bigvee_{j=1}^3 (V_{1ij,3} \wedge \neg(V_{1ij,2} \oplus V_{1i,2}) \wedge \neg(V_{1ij,1} \oplus V_{1i,1})) \wedge \\ V_{1ij,1} &\leftrightarrow \bigwedge_{k=1}^3 V_{1ijk,1} \wedge \\ V_{1ij,2} &\leftrightarrow \bigwedge_{k=1}^3 (V_{1ijk,2} \vee (V_{1ijk,1} \oplus V_{1ij,1})) \wedge \\ V_{1ij,3} &\leftrightarrow \bigwedge_{k=1}^3 (V_{1ijk,3} \vee (V_{1ijk,2} \oplus V_{1ij,2}) \vee (V_{1ijk,1} \oplus V_{1ij,1})) \end{aligned}$$

$$\left(\bigwedge_{i=1}^3 (V_{1i,1} \vee \neg V_{1i,1}) \right) \wedge \left(V_{1,1} \vee \bigvee_{i=1}^3 \neg V_{1i,1} \right) \wedge \\ \bigwedge_{i=1}^3 ((\neg V_{1,2} \vee V_{1i,2} \vee V_{1,1} \vee V_{1i,1}, 1) \wedge (\neg V_{1,2} \vee V_{1i,2} \vee \neg V_{1,1} \vee \neg V_{1i,1}, 1)) \wedge \\ \bigwedge_{s \in \{1,2,3,4\}^3} \bigvee_{i=1}^3 t_{s_i}$$

(where $t_1 := V_{1,2} \vee \neg V_{1i,2}$, $t_2 := V_{1,2}$, $t_3 := V_{1,2} \vee V_{1i,1} \vee \neg V_{1,1}$ and $t_4 := V_{1,2} \vee V_{1,1} \vee \neg V_{1i,1}$)

$$\left(\bigwedge_{i=1}^3 (\neg V_{1,2} \vee V_{1i,2} \vee ((V_{1i,1} \vee V_{1,1}) \wedge (\neg V_{1i,1} \vee \neg V_{1,1}))) \right) \wedge \\ \left(\bigwedge_{i=1}^3 (\neg V_{1,2} \vee V_{1i,2} \vee ((V_{1i,1} \vee V_{1,1}) \wedge (\neg V_{1i,1} \vee \neg V_{1,1}))) \right) \wedge \left(\neg \bigwedge_{i=1}^3 (V_{1i,2} \vee (V_{1i,1} \oplus V_{1,1})) \vee V_{1,2} \right) \wedge \\ V_{1,3} \leftrightarrow \bigwedge_{i=1}^3 (V_{1i,3} \vee (V_{1i,2} \oplus V_{1,2}) \vee (V_{1i,1} \oplus V_{1,1})) \wedge \\ V_{1i,1} \leftrightarrow \bigvee_{j=1}^3 V_{1ij,1} \wedge \\ V_{1i,2} \leftrightarrow \bigvee_{j=1}^3 (V_{1ij,2} \wedge \neg (V_{1ij,1} \oplus V_{1i,1})) \wedge \\ V_{1i,3} \leftrightarrow \bigvee_{j=1}^3 (V_{1ij,3} \wedge \neg (V_{1ij,2} \oplus V_{1i,2}) \wedge \neg (V_{1ij,1} \oplus V_{1i,1})) \wedge \\ V_{1ij,1} \leftrightarrow \bigwedge_{k=1}^3 V_{1ijk,1} \wedge \\ V_{1ij,2} \leftrightarrow \bigwedge_{k=1}^3 (V_{1ijk,2} \vee (V_{1ijk,1} \oplus V_{1ij,1})) \wedge \\ V_{1ij,3} \leftrightarrow \bigwedge_{k=1}^3 (V_{1ijk,3} \vee (V_{1ijk,2} \oplus V_{1ij,2}) \vee (V_{1ijk,1} \oplus V_{1ij,1})) \wedge$$