$$V_{1,1} = \bigwedge_{i=1}^{3} V_{1i,1}$$
$$V_{1,2} = \left(V_{1,1} \wedge \left(\bigwedge_{i=1}^{3} V_{1i,1}\right)\right) \vee \left(\neg V_{1,1} \wedge \left(\bigwedge_{i=1}^{3} (V_{1i,1} \vee V_{1i,2})\right)\right)$$
$$V_{1,3} = \left(V_{1,1} \wedge V_{1,2} \wedge \left(\bigwedge_{i=1}^{3} V_{1i,3}\right)\right) \vee \left(V_{1,1} \wedge \neg V_{1,2} \wedge \left(\bigwedge_{i=1}^{3} (V_{1i,2} \vee V_{1i,3})\right)\right) \vee$$
$$\left(\neg V_{1,1} \wedge V_{1,2} \wedge \left(\bigwedge_{i=1}^{3} (V_{1i,1} \vee \neg V_{1i,2} \vee V_{1i,3})\right)\right) \vee \left(\neg V_{1,1} \wedge \neg V_{1,2} \wedge \left(\bigwedge_{i=1}^{3} (V_{1i,1} \vee V_{1i,2} \vee V_{1i,3})\right)\right)$$

Simplifies to:

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