

$$(1) C_{1,1} \leftrightarrow B_{1,2} \vee B_{2,1}$$

$$(2) C_{2,1} \leftrightarrow B_{1,1} \vee B_{2,2} \vee B_{3,1}$$

$$(3) C_{3,1} \leftrightarrow B_{2,1} \vee B_{3,2}$$

$$(4) C_{1,2} \leftrightarrow B_{1,3} \vee B_{2,2} \vee B_{1,1}$$

$$(5) C_{2,2} \leftrightarrow B_{1,2} \vee B_{2,3} \vee B_{3,2} \vee B_{2,1}$$

$$(6) C_{3,2} \leftrightarrow B_{2,2} \vee B_{3,3} \vee B_{3,1}$$

$$(7) C_{1,3} \leftrightarrow B_{2,3} \vee B_{1,2}$$

$$(8) C_{2,3} \leftrightarrow B_{1,3} \vee B_{3,3} \vee B_{2,2}$$

$$(9) C_{3,3} \leftrightarrow B_{2,3} \vee B_{3,2}$$

$$(12) (C_{1,1} \rightarrow B_{1,2} \vee B_{2,1}) \wedge (B_{1,2} \vee B_{2,1} \rightarrow C_{1,1}) ; (1)$$

$$(13) B_{1,2} \vee B_{2,1} \rightarrow C_{1,1}$$

$$(14) \sim C_{1,1} \rightarrow \sim (B_{1,2} \vee B_{2,1}) ; T \rightarrow \square \approx \square$$

$$(15) \sim (B_{1,2} \vee B_{2,1})$$

$$(16) \sim B_{1,2} \wedge \sim B_{2,1}$$

$$(17) \sim B_{1,2} \quad \sim B_{2,1}$$

$$(18) \sim C_{2,1} \rightarrow \sim (B_{1,1} \vee B_{2,2} \vee B_{3,1}) ; (2)$$

$$(19) \sim B_{2,2} \quad \sim B_{3,1}$$

$$(21) \sim C_{3,1} \rightarrow \sim (B_{2,1} \vee B_{3,2})$$

$$(22) \sim B_{3,2}$$

$$(24) B_{2,2} \vee B_{3,3} \vee B_{3,1} ; (6)$$

$$(25) B_{3,3}$$

$$(10) \sim B_{1,1} \quad \text{ข้ออื่นใน A} \rightarrow (10)$$

$$(11) \sim C_{1,1}$$

$$\text{ข้อนี้ไปที่ (2,1) ได้ \sim C_{2,1}}$$

$$(18) \sim C_{2,1}$$

$$\text{ข้อนี้ไปที่ (3,1) ได้ \sim C_{3,1}}$$

$$(20) \sim C_{3,1}$$

$$\text{ข้อนี้ไปที่ (3,2) ได้ \sim C_{3,2} \text{ ษา}}$$

$$(23) C_{3,2}$$

$$(1,3) \quad (2,3) \quad (3,3)$$

$$(1,2) \quad (2,2) \quad (3,2)$$

$$(1,1) \quad (2,1) \quad (3,1)$$

$$(3,3)$$

(3,2)

$$(1) C_{1,1} \leftrightarrow B_{1,2} \vee B_{2,1}$$

$$(2) C_{2,1} \leftrightarrow B_{1,1} \vee B_{2,2} \vee B_{3,1}$$

$$(3) C_{3,1} \leftrightarrow B_{2,1} \vee B_{3,2}$$

$$(4) C_{1,2} \leftrightarrow B_{1,3} \vee B_{2,2} \vee B_{1,1}$$

$$(5) C_{2,2} \leftrightarrow B_{1,2} \vee B_{2,3} \vee B_{3,2} \vee B_{2,1}$$

$$(6) C_{3,2} \leftrightarrow B_{2,2} \vee B_{3,3} \vee B_{3,1}$$

$$(7) C_{1,3} \leftrightarrow B_{2,3} \vee B_{1,2}$$

$$(8) C_{2,3} \leftrightarrow B_{1,3} \vee B_{3,3} \vee B_{2,2}$$

$$(9) C_{3,3} \leftrightarrow B_{2,3} \vee B_{3,2}$$

$$(12) (C_{1,1} \rightarrow B_{1,2} \vee B_{2,1}) \wedge (B_{1,2} \vee B_{2,1} \rightarrow C_{1,1}) ; (1)$$

$$(13) B_{1,2} \vee B_{2,1} \rightarrow C_{1,1}$$

$$(14) \sim C_{1,1} \rightarrow \sim (B_{1,2} \vee B_{2,1}) ; T \rightarrow \square \approx \square$$

$$(15) \sim (B_{1,2} \vee B_{2,1})$$

$$(16) \sim B_{1,2} \wedge \sim B_{2,1}$$

$$(17) \sim B_{1,2} \quad \sim B_{2,1}$$

$$(18) \sim C_{2,1} \rightarrow \sim (B_{1,1} \vee B_{2,2} \vee B_{3,1}) ; (2)$$

$$(19) \sim B_{2,2} \quad \sim B_{3,1}$$

$$(20) B_{2,1} \vee B_{3,2}$$

$$(21) B_{3,2}$$

$$(10) \sim B_{1,1} \quad \text{ใส่สมการ } \rightarrow (10)$$

$$(17) \sim C_{1,1}$$

เดินไปที่ (2,1) ได้  $\sim C_{2,1}$

$$(18) \sim C_{2,1}$$

เดินต่อไปที่ (3,1) ได้  $C_{3,1}$

$$(20) C_{3,1}$$

(1,3) (2,3) (3,3)

(1,2) (2,2) (3,2)

(1,1) (2,1) (3,1)

$$(1) C_{1,1} \leftrightarrow B_{1,2} \vee B_{2,1}$$

$$(2) C_{2,1} \leftrightarrow B_{1,1} \vee B_{2,2} \vee B_{3,1}$$

$$(3) C_{3,1} \leftrightarrow B_{2,1} \vee B_{3,2}$$

$$(4) C_{1,2} \leftrightarrow B_{1,3} \vee B_{2,2} \vee B_{1,1}$$

$$(5) C_{2,2} \leftrightarrow B_{1,2} \vee B_{2,3} \vee B_{3,2} \vee B_{2,1}$$

$$(6) C_{3,2} \leftrightarrow B_{2,2} \vee B_{3,3} \vee B_{3,1}$$

$$(7) C_{1,3} \leftrightarrow B_{2,3} \vee B_{1,2}$$

$$(8) C_{2,3} \leftrightarrow B_{1,3} \vee B_{3,3} \vee B_{2,2}$$

$$(9) C_{3,3} \leftrightarrow B_{2,3} \vee B_{3,2}$$

$$(12) \sim B_{1,2} \wedge \sim B_{2,1} ; (1)$$

$$(14) B_{1,1} \vee B_{2,2} \vee B_{3,1} ; (2)$$

$$(15) B_{2,2} \vee B_{3,1}$$

$$(17) \sim B_{1,3} \wedge \sim B_{2,2} \wedge \sim B_{1,1} ; (4)$$

$$(18) B_{3,1} ; (15)$$

$$(10) \sim B_{1,1} \text{ ବଞ୍ଚେନା } \rightarrow (10)$$

$$(11) \sim C_{1,1}$$

$$(13) C_{2,1}$$

$$\text{ନଷ୍ଟ } B_{1,1} \\ B_{1,2}$$

$$(16) \sim C_{1,2}$$

(3,1)

$$(1,3) (2,3) (3,3)$$

$$(1,2) (2,2) (3,2)$$

$$(1,1) (2,1) (3,1)$$

(2,3)

$$(1) C_{1,1} \leftrightarrow B_{1,2} \vee B_{2,1}$$

$$(2) C_{2,1} \leftrightarrow B_{1,1} \vee B_{2,2} \vee B_{3,1}$$

$$(3) C_{3,1} \leftrightarrow B_{2,1} \vee B_{3,2}$$

$$(4) C_{1,2} \leftrightarrow B_{1,3} \vee B_{2,2} \vee B_{1,1}$$

$$(5) C_{2,2} \leftrightarrow B_{1,2} \vee B_{2,3} \vee B_{3,2} \vee B_{2,1}$$

$$(6) C_{3,2} \leftrightarrow B_{2,2} \vee B_{3,3} \vee B_{3,1}$$

$$(7) C_{1,3} \leftrightarrow B_{2,3} \vee B_{1,2}$$

$$(8) C_{2,3} \leftrightarrow B_{1,3} \vee B_{3,3} \vee B_{2,2}$$

$$(9) C_{3,3} \leftrightarrow B_{2,3} \vee B_{3,2}$$

$$(12) \sim B_{1,2} \wedge \sim B_{2,1} ; (1)$$

$$(14) \sim B_{1,1} \wedge \sim B_{2,2} \wedge \sim B_{3,1} ; (2)$$

$$(16) \sim B_{2,1} \wedge \sim B_{3,2} ; (3)$$

$$(18) \sim B_{2,2} \wedge \sim B_{3,3} \wedge \sim B_{3,1} ; (6)$$

$$(20) B_{1,2} \vee B_{2,3} \vee B_{3,2} \vee B_{2,1} ; (5)$$

$$(21) B_{2,3}$$

$$(10) \sim B_{1,1} \text{ 68811811 } \rightarrow (10)$$

$$(11) \sim C_{1,1}$$

$$(13) \sim C_{2,1}$$

$$(15) \sim C_{3,1}$$

$$(17) \sim C_{3,2}$$

$$(19) C_{2,2}$$

(1,3)	(2,3)	(3,3)
(1,2)	(2,2)	(3,2)
(1,1)	(2,1)	(3,1)

$$(1) C_{1,1} \leftrightarrow B_{1,2} \vee B_{2,1}$$

$$(2) C_{2,1} \leftrightarrow B_{1,1} \vee B_{2,2} \vee B_{3,1}$$

$$(3) C_{3,1} \leftrightarrow B_{2,1} \vee B_{3,2}$$

$$(4) C_{1,2} \leftrightarrow B_{1,3} \vee B_{2,2} \vee B_{1,1}$$

$$(5) C_{2,2} \leftrightarrow B_{1,2} \vee B_{2,3} \vee B_{3,2} \vee B_{2,1}$$

$$(6) C_{3,2} \leftrightarrow B_{2,2} \vee B_{3,3} \vee B_{3,1}$$

$$(7) C_{1,3} \leftrightarrow B_{2,3} \vee B_{1,2}$$

$$(8) C_{2,3} \leftrightarrow B_{1,3} \vee B_{3,3} \vee B_{2,2}$$

$$(9) C_{3,3} \leftrightarrow B_{2,3} \vee B_{3,2}$$

$$(12) (C_{1,1} \rightarrow B_{1,2} \vee B_{2,1}) \wedge (B_{1,2} \vee B_{2,1} \rightarrow C_{1,1}) ; (1)$$

$$(13) B_{1,2} \vee B_{2,1} \rightarrow C_{1,1}$$

$$(14) \sim C_{1,1} \rightarrow \sim (B_{1,2} \vee B_{2,1}) ; T \rightarrow \square \approx \square$$

$$(15) \sim (B_{1,2} \vee B_{2,1})$$

$$(16) \sim B_{1,2} \wedge \sim B_{2,1}$$

$$(17) \sim B_{1,2} \quad \sim B_{2,1}$$

$$(14) (C_{2,1} \rightarrow B_{1,1} \vee B_{2,2} \vee B_{3,1}) \wedge (B_{1,1} \vee B_{2,2} \vee B_{3,1} \rightarrow C_{2,1})$$

$$(20) C_{2,1} \rightarrow B_{1,1} \vee B_{2,2} \vee B_{3,1} ; T \rightarrow \square \approx \square$$

$$(21) B_{1,1} \vee B_{2,2} \vee B_{3,1}$$

$$(22) B_{2,2} \vee B_{3,1}$$

$$(24) (C_{1,2} \rightarrow B_{1,3} \vee B_{2,2} \vee B_{1,1}) \wedge (B_{1,3} \vee B_{2,2} \vee B_{1,1} \rightarrow C_{1,2})$$

$$(25) C_{1,2} \rightarrow B_{1,3} \vee B_{2,2} \vee B_{1,1} ; T \rightarrow \square \approx \square$$

$$(26) B_{1,3} \vee B_{2,2} \vee B_{1,1}$$

$$(27) B_{1,3} \vee B_{2,2}$$

$$(28) (B_{2,2} \vee B_{3,1}) \wedge (B_{1,3} \vee B_{2,2})$$

$$(29) B_{2,2} \vee (B_{3,1} \wedge B_{1,3})$$

$$(30) B_{2,2}$$

$$(10) \sim B_{1,1} \quad \text{ข้อนี้ผิด} \rightarrow (10)$$

$$(17) \sim C_{1,1}$$

เดินไปตรงกลางที่ (2,1) ให้ดู percept  $C_{2,1}$

$$(18) C_{2,1}$$

เดินกลับกลางที่ (1,1) ให้ดู percept

เดินไปที่ (1,2) ให้ดู percept  $C_{1,2}$

$$(23) C_{1,2}$$

$$(1,3) \quad (2,3) \quad (3,3)$$

$$(1,2) \quad (2,2) \quad (3,2)$$

$$(1,1) \quad (2,1) \quad (3,1)$$

(2,2)

(2,1)

①  $C_{1,1} \leftrightarrow B_{1,2} \vee B_{2,1}$

②  $C_{2,1} \leftrightarrow B_{1,1} \vee B_{2,2} \vee B_{3,1}$

③  $C_{3,1} \leftrightarrow B_{2,1} \vee B_{3,2}$

④  $C_{1,2} \leftrightarrow B_{1,3} \vee B_{2,2} \vee B_{1,1}$

⑤  $C_{2,2} \leftrightarrow B_{1,2} \vee B_{2,3} \vee B_{3,2} \vee B_{2,1}$

⑥  $C_{3,2} \leftrightarrow B_{2,2} \vee B_{3,3} \vee B_{3,1}$

⑦  $C_{1,3} \leftrightarrow B_{2,3} \vee B_{1,2}$

⑧  $C_{2,3} \leftrightarrow B_{1,3} \vee B_{3,3} \vee B_{2,2}$

⑨  $C_{3,3} \leftrightarrow B_{2,3} \vee B_{3,2}$

⑩  $B_{1,2} \vee B_{2,1}$

⑪  $B_{2,1}$

✖

⑩  $\sim B_{1,1}$  68511511  $\rightarrow$  ⑩

⑪  $C_{1,1}$

ถ้าเป็นจริง

ถ้าเป็นไปจริงหมด?

⑫  $\sim C_{1,2}$

⑬  $\sim B_{1,2}$

~~(1,3)~~ (2,3) (3,3)

~~(1,2)~~ ~~(2,2)~~ (3,2)

~~(1,1)~~ ~~(2,1)~~ (3,1)

$$\textcircled{10} C_{1,1} \leftrightarrow B_{1,2} \vee B_{2,1}$$

$$(2) C_{2,1} \leftrightarrow B_{1,1} \vee B_{2,2} \vee B_{3,1}$$

$$\textcircled{3} \quad C_{3,1} \longleftrightarrow B_{2,1} \vee B_{3,2}$$

$$(4) C_{1,2} \hookrightarrow B_{1,3} \vee B_{2,2} \vee B_{1,1}$$

$$\textcircled{5} C_{2,2} \Leftrightarrow B_{1,2} \vee B_{2,3} \vee B_{3,2} \vee B_{2,1}$$

⑥.  $C_{3,2} \leftrightarrow B_{2,2} \vee B_{3,3} \vee B_{3,7}$

(7)  $C_{1,3} \leftrightarrow B_{2,3} \vee B_{1,2}$

⑧.  $C_{2,3} \leftrightarrow B_{1,3} \vee B_{3,3} \vee B_{2,2}$

⑨.  $C_{3,3} \leftrightarrow B_{2,3} \vee B_{3,2}$

$$(12) \sim \beta_{1,2,2} \wedge \sim \beta_{2,7}; (7)$$

$$(14) \sim \beta_{1,1} \wedge \sim \beta_{2,2} \wedge \sim \beta_{3,1} ; (2)$$

$$(16) \sim B_{2,1} \wedge \sim B_{3,2} ; (3)$$

$$(18) \sim \beta_{2,2} \wedge \sim \beta_{3,3} \wedge \sim \beta_{3,1}; (6)$$

$$(14) \sim \beta_{1,2} \wedge \sim \beta_{2,3} \wedge \sim \beta_{3,2} \wedge \sim \beta_{2,1} \quad (15)$$

②  $B_{1,3} \vee B_{2,2} \vee B_{1,1}$

② 13, 3

10.  $\sim B_{1,1}$   $68\% \rightarrow 10$

$$(17) \sim C_{1,1}$$

$$(13) \sim C_{2,1}$$

$$(15) \sim C_{3,1}$$

(17)  $\sim C_{3,2}$

$$\mathbb{P}G \sim C_{2,2}$$

20  $C_{1,2}$

$(1, 3)$	$(2, 3)$	$(3, 3)$
$(1, 2)$	$(2, 2)$	$(3, 2)$
$(1, 1)$	$(2, 1)$	$(3, 1)$

$(1, 2) \quad (2, 2) \quad (3, 2)$

~~(1,1)~~ ~~(2,1)~~ ~~(3,1)~~

$$\textcircled{1} C_{1,1} \leftrightarrow B_{1,2} \vee B_{2,1}$$

$$\textcircled{2} C_{2,1} \leftrightarrow B_{1,1} \vee B_{2,2} \vee B_{3,1}$$

$$\textcircled{3} C_{3,1} \leftrightarrow B_{2,1} \vee B_{3,2}$$

$$\textcircled{4} C_{1,2} \leftrightarrow B_{1,3} \vee B_{2,2} \vee B_{1,1}$$

$$\textcircled{5} C_{2,2} \leftrightarrow B_{1,2} \vee B_{2,3} \vee B_{3,2} \vee B_{2,1}$$

$$\textcircled{6} C_{3,2} \leftrightarrow B_{2,2} \vee B_{3,3} \vee B_{3,1}$$

$$\textcircled{7} C_{1,3} \leftrightarrow B_{2,3} \vee B_{1,2}$$

$$\textcircled{8} C_{2,3} \leftrightarrow B_{1,3} \vee B_{3,3} \vee B_{2,2}$$

$$\textcircled{9} C_{3,3} \leftrightarrow B_{2,3} \vee B_{3,2}$$

$$\textcircled{12} B_{1,2} \vee B_{2,1}$$

$$\textcircled{13} B_{1,2}$$

$$\textcircled{10} \sim B_{1,1} \text{ តំណាង } \rightarrow \textcircled{16}$$

$$\textcircled{17} C_{1,1}$$

ក៏បានដំណើរការសរសេរ ——— តាមលំដាប់លំដោយ

$$\textcircled{13} C_{2,1}$$

$$\textcircled{14} \sim B_{2,1}$$

$$(1,3) \quad (2,3) \quad (3,3)$$

$$(1,2) \quad (2,2) \quad (3,2)$$

$$(1,1) \quad (2,1) \quad (3,1)$$

(1,2)



