

8. 下列各等式分別是依據哪一項布林法則推導出來的。

9. 在下列各表示式中應用狄摩根定理：

$$\begin{aligned} (h) \overline{(A+B)(\bar{C}+D)} \\ &= \overline{A+B} + \overline{\bar{C}+D} \\ &= \bar{A}\bar{B} + \bar{\bar{C}}\bar{D} \\ &= \bar{A}\bar{B} + CD \end{aligned}$$

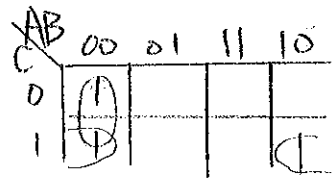
10. 在下列各表示式中應用狄摩根定理：

$$\begin{aligned} (a) \overline{A\bar{B}(C+\bar{D})} &= \bar{A} + \bar{\bar{B}} + \overline{(C+\bar{D})} \\ &= \bar{A} + B + \bar{C}D \\ (b) \overline{AB(CD+EF)} &= \bar{A}\bar{B} + \overline{CD+EF} \\ &= \bar{A}\bar{B} + \bar{C}\bar{D}\bar{E}\bar{F} \\ &= \bar{A}\bar{B} + (\bar{C}+\bar{D})(\bar{E}+\bar{F}) \end{aligned}$$

$$\begin{aligned} (c) \overline{(A+\bar{B}+C+\bar{D})} + \overline{ABC\bar{D}} \\ &= \bar{A}\bar{\bar{B}}\bar{C}\bar{\bar{D}} + \bar{A}\bar{B} + \bar{C} + \bar{\bar{D}} \\ &= \bar{A}B\bar{C}D + (\bar{A} + \bar{B} + \bar{C} + D) \end{aligned}$$

38. 利用卡諾圖找出各表示式的最小SOP形式

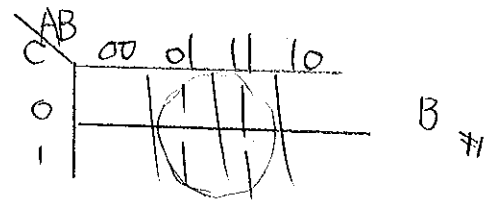
(a)  $\bar{A}\bar{B}\bar{C} + \bar{A}B\bar{C} + A\bar{B}C$



$\bar{A}\bar{B} + \bar{B}C$

(c)  $\bar{A}(BC + \bar{B}\bar{C}) + A(BC + \bar{B}\bar{C})$

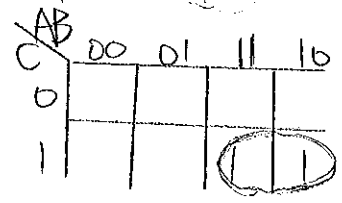
$= \bar{A}BC + \bar{A}\bar{B}\bar{C} + ABC + A\bar{B}\bar{C}$



$B$

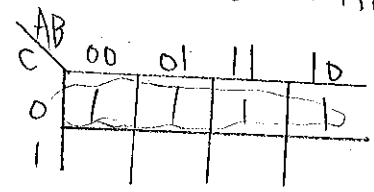
(b)  $AC(\bar{B}+C)$

$= A\bar{B}C + AC$



$AC$

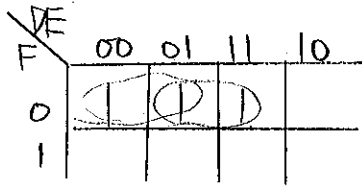
(d)  $\bar{A}\bar{B}\bar{C} + \bar{A}\bar{B}C + \bar{A}B\bar{C} + A\bar{B}\bar{C}$



$\bar{C}$

39. 利用卡諾圖將下列各表示式簡化成最小 SOP 形式：

(c)  $DEF + \bar{D}E\bar{F} + \bar{D}EF$

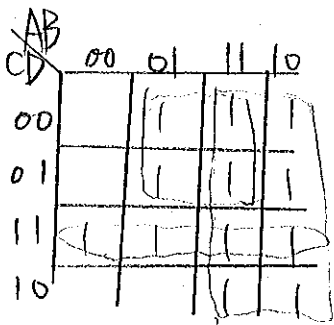


$\bar{D}\bar{F} + EF\bar{F}$

42. 利用卡諾圖將下列各表示式簡化成最小 SOP 形式：

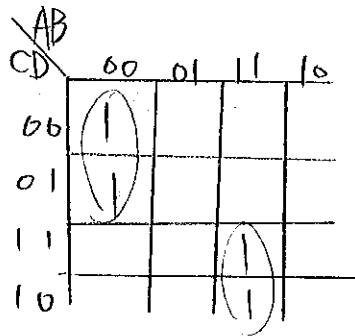
(a)  $A + \bar{B}\bar{C} + CD$

1xxx x10x xx11



$\bar{B}\bar{C} + A + CD$

(b)  $\bar{A}\bar{B}\bar{C}\bar{D} + \bar{A}\bar{B}\bar{C}D + ABCD + ABC\bar{D}$



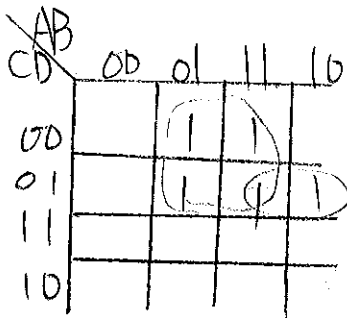
$\bar{A}\bar{B}\bar{C} + ABC$

(c)  $\bar{A}\bar{B}(\bar{C}\bar{D} + \bar{C}D) + AB(\bar{C}\bar{D} + \bar{C}D) + A\bar{B}\bar{C}\bar{D}$

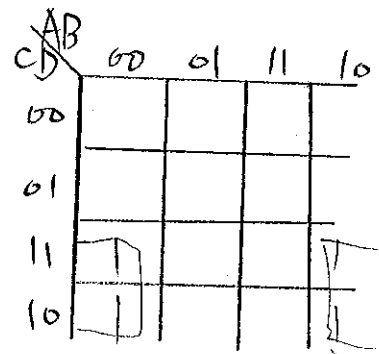
$= \bar{A}\bar{B}\bar{C}\bar{D} + \bar{A}\bar{B}\bar{C}D + A\bar{B}\bar{C}\bar{D} + A\bar{B}\bar{C}D + A\bar{B}\bar{C}\bar{D}$

(d)  $(\bar{A}\bar{B} + A\bar{B})(CD + C\bar{D})$

$= \bar{A}\bar{B}CD + \bar{A}\bar{B}C\bar{D} + A\bar{B}CD + A\bar{B}C\bar{D}$



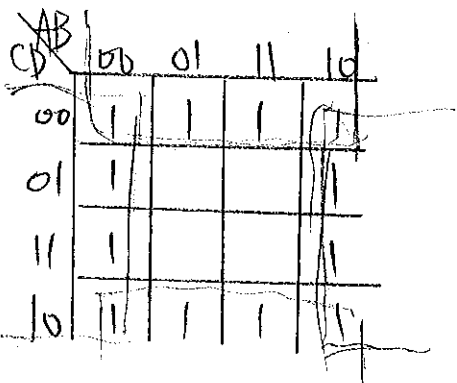
$\bar{B}\bar{C} + A\bar{C}\bar{D}$



$\bar{B}\bar{C}$

(e)  $\bar{A}\bar{B} + A\bar{B} + \bar{C}\bar{D} + C\bar{D}$

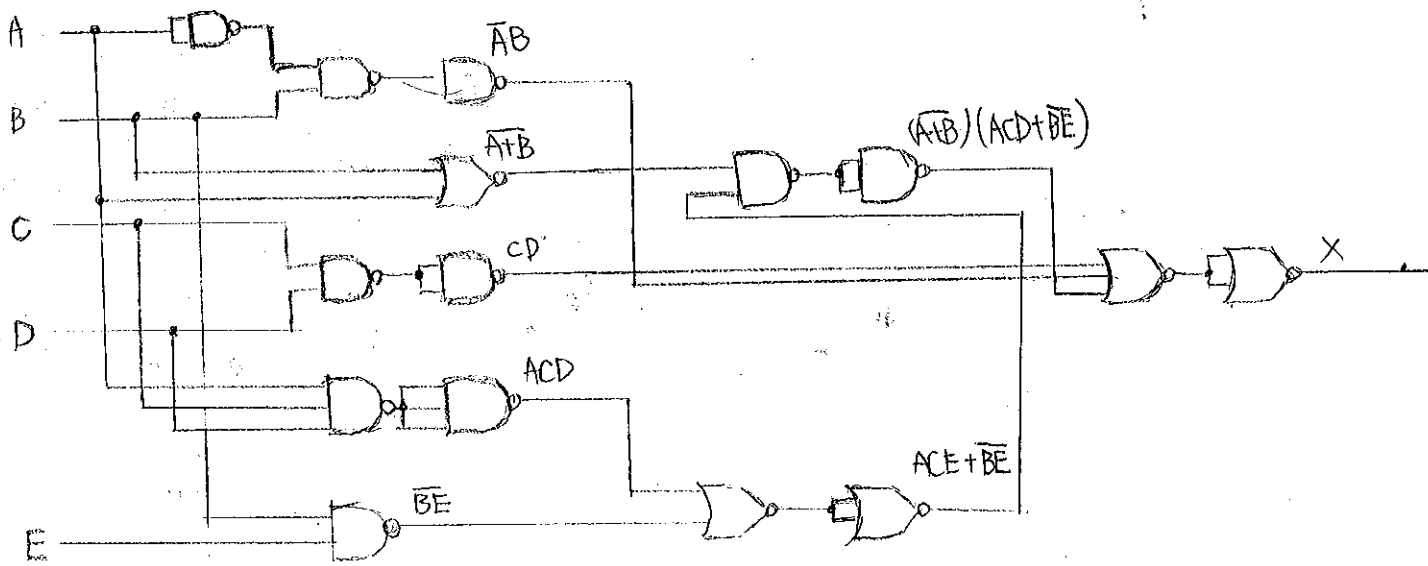
00xx 10xx xx00 xx10



$B + D$

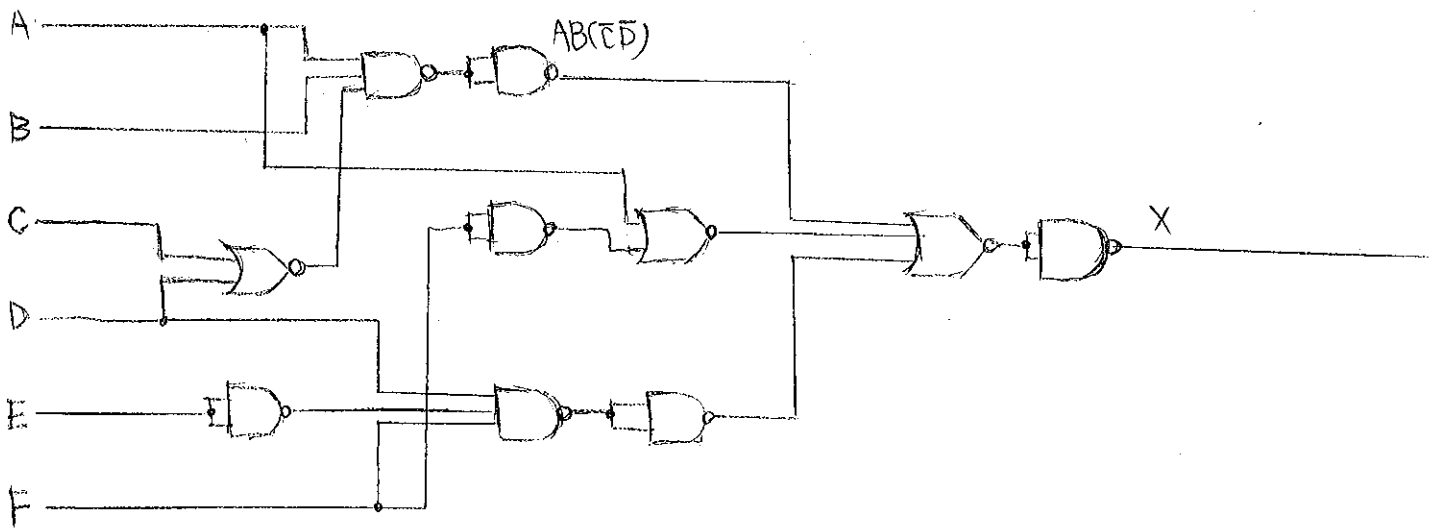
10. 使用 NAND 閘, NOR 閘, 或兩者的組合來實現下列邏輯表示式:

(a)  $X = \bar{A}B + CD + (\bar{A}+B)(ACD + \bar{B}E)$

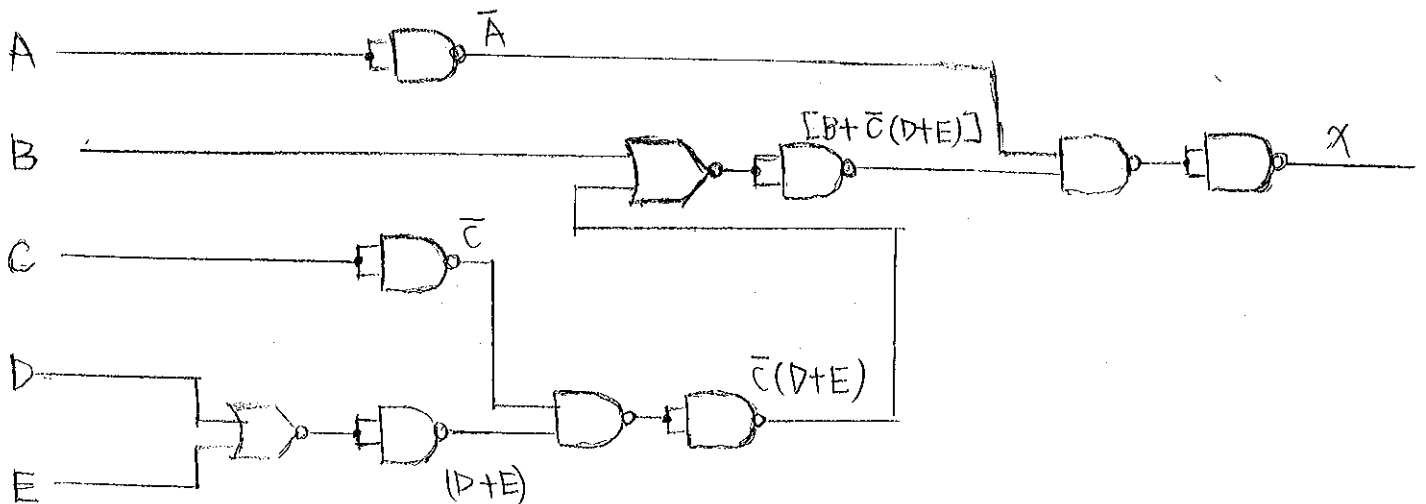


(CFD)

(b)  $X = ABC\bar{D} + DEF + \bar{A}F$

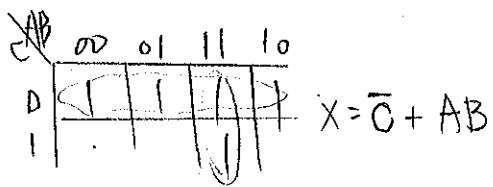


(c)  $X = \bar{A}[B + \bar{C}(D + E)]$

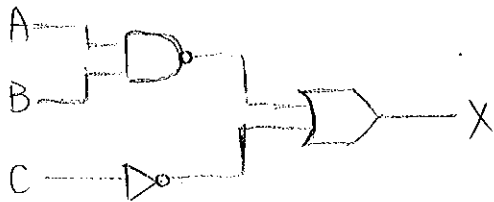


11. 根據表 5-6 的真值表來實現其邏輯電路。

輸入端			輸出端
A	B	C	X
0	0	0	1
0	0	1	0
0	1	0	1
0	1	1	0
1	0	0	1
1	0	1	0
1	1	0	1
1	1	1	1

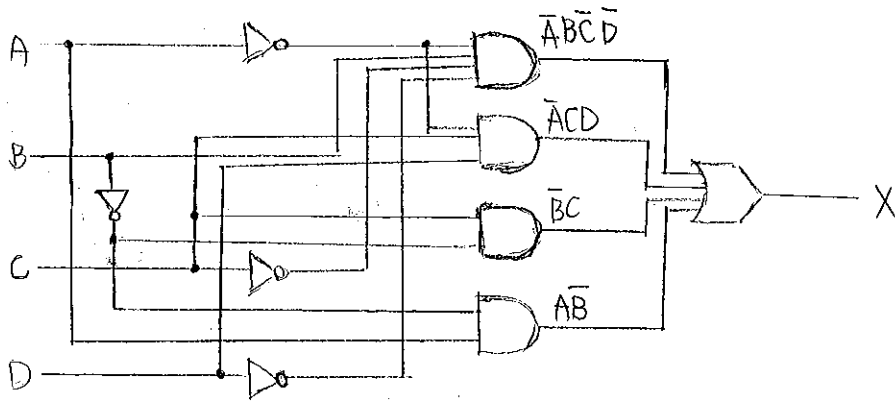
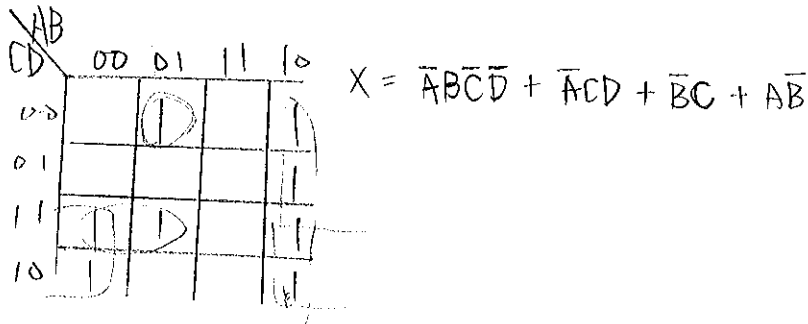


2

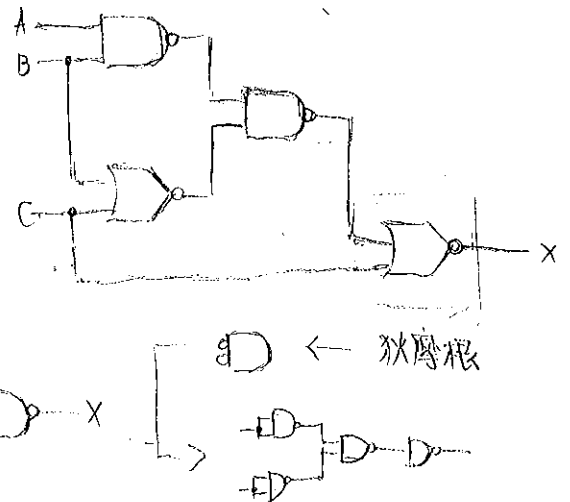
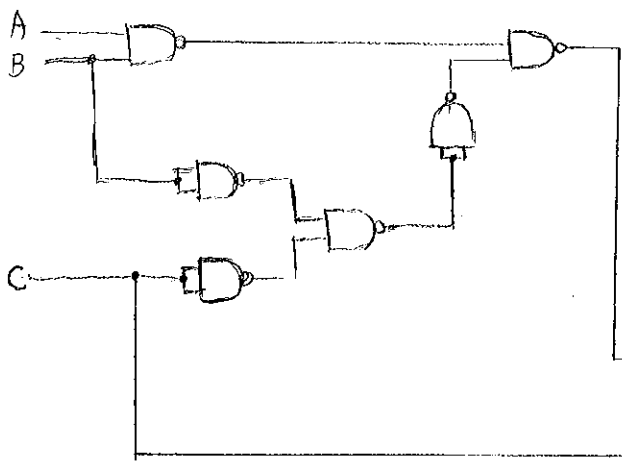


12. 根據表 5-7 的真值表，將邏輯電路實現出來

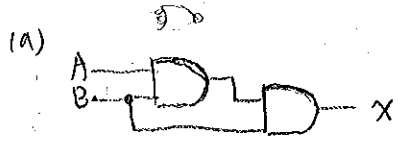
輸入端				輸出端
A	B	C	D	X
0	0	0	0	0
0	0	0	1	0
0	0	1	0	1
0	0	1	1	1
0	1	0	0	1
0	1	0	1	0
0	1	1	0	0
0	1	1	1	0
1	0	0	0	1
1	0	0	1	1
1	0	1	0	1
1	0	1	1	1
1	1	0	0	0
1	1	0	1	0
1	1	1	0	0
1	1	1	1	1



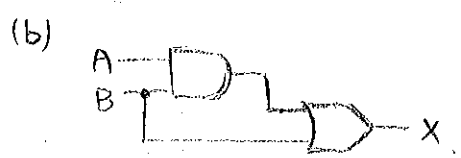
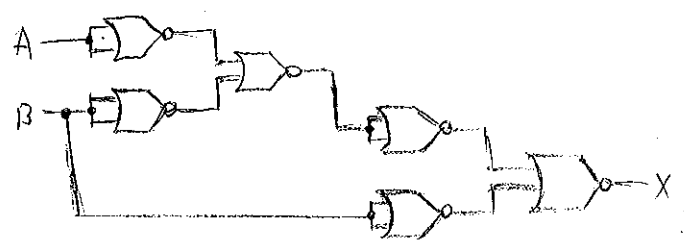
19. 只用 NAND 閘，實現出圖 5-42 的邏輯電路。



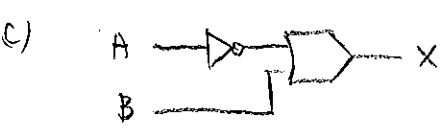
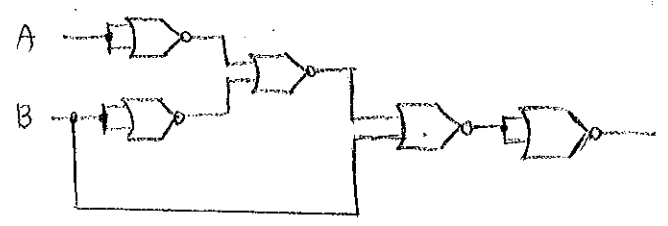
20. 只用 NOR 閘重做 18。



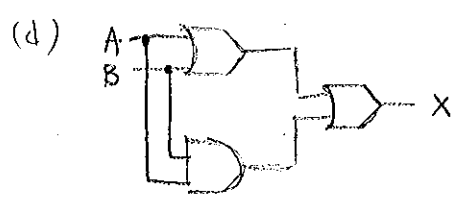
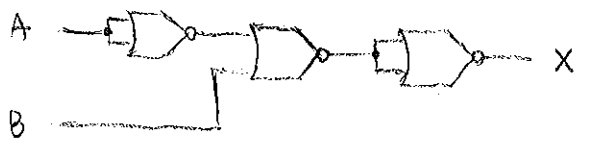
⇓



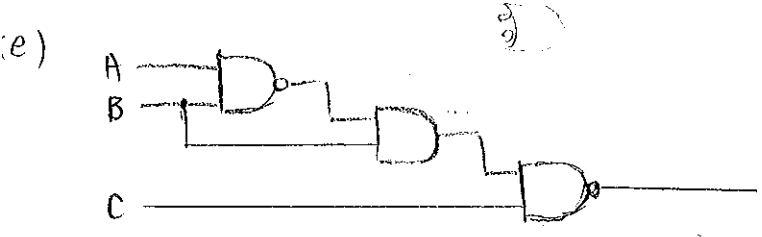
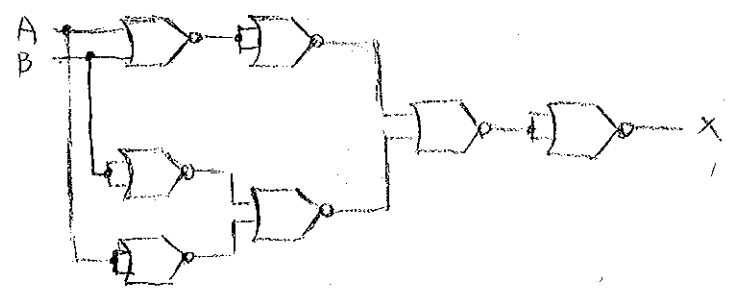
⇓



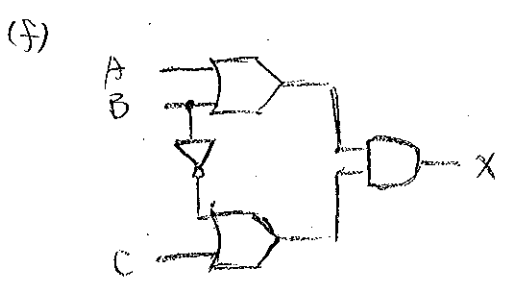
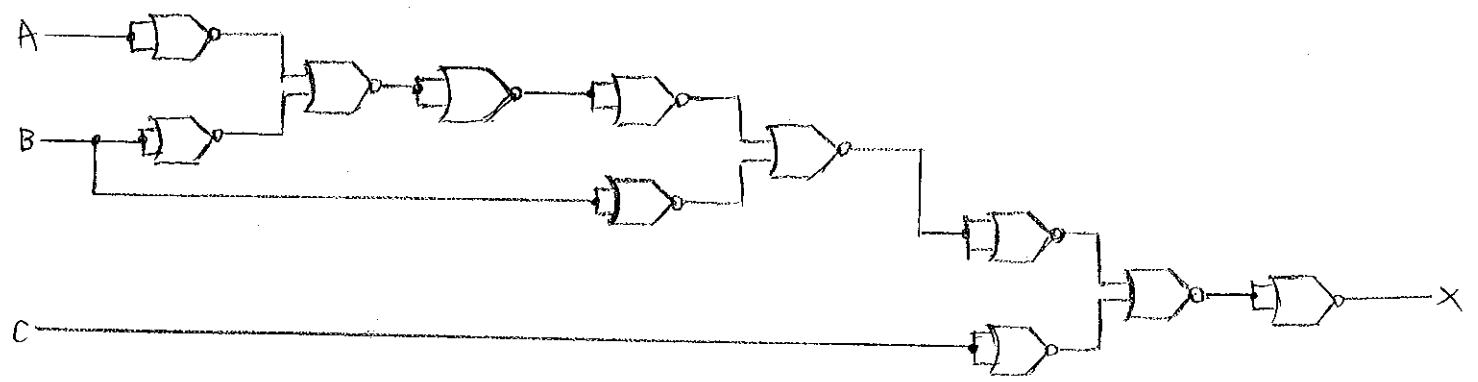
⇓



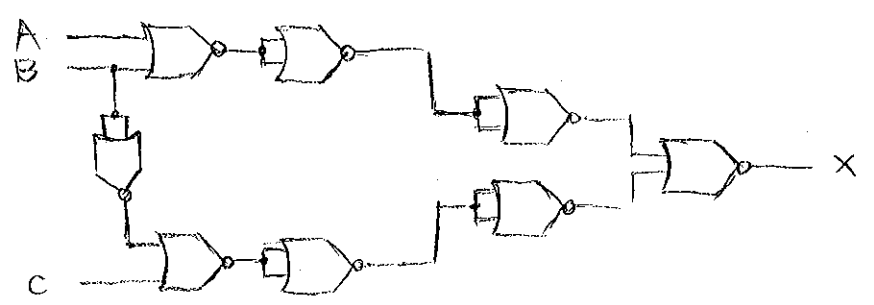
⇓



⇓



⇓



21. 只用 NOR 閘，重做問題 19.

