

8. 下列各等式分別是以依據哪一項布林法則推導出來的

- (a) $AB + CD + EF = ABCD + EF$ $\bar{A} = A$ #
- (b) $A\bar{A}B + AB\bar{C} + ABB = AB\bar{C}$ $AB(\bar{A} + B) + AB\bar{C} = AB(\bar{A}B) + AB\bar{C} = AB\bar{C}$ #
- (c) $A(B\bar{C} + BC) + AC = A(BC) + AC$ $A + A = A$ #
- (d) $A\bar{B}(\bar{C} + C) + AC = AB + AC$ $C + \bar{C} = 1$ #
- (e) $\bar{A}\bar{B} + A\bar{B}C = \bar{A}\bar{B}$ $A + \bar{A}B = A$ #
- (f) $AB\bar{C} + \bar{A}B + ABCD = AB\bar{C} + \bar{A}B + D$ $A + \bar{A}B = A + B$ #

10. 在下列各表示式中應用吸收律

- (a) $\overline{A\bar{B}C + D} = \bar{A}\bar{B} + \bar{C}\bar{D} = \bar{A} + \bar{B} + \bar{C}\bar{D}$ #
- (b) $\overline{AB(CD + EF)} = \bar{A} + \bar{B} + \overline{CD + EF} = \bar{A} + \bar{B} + (\bar{C}\bar{D})(\bar{E}\bar{F})$ #
- (c) $\overline{A + B + C + D + AB\bar{C}D} = \bar{A}\bar{B}\bar{C}\bar{D} + \bar{A}\bar{B}\bar{C} + \bar{D}$ #

9. 在下列各表示式中應用吸收律

(h) $(A + B)(\bar{C} + D) = \bar{A}\bar{B} + CD$ #

38. 利用卡諾圖找出各表示式的最小 SOP 形式

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

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

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

 AC #

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

 B #

(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. (c) $DE\bar{F} + D\bar{E}\bar{F} + \bar{D}\bar{E}\bar{F}$

 $\bar{E} + \bar{D}\bar{F}$ #

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

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

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

 $\bar{B}C$ #

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

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

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

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

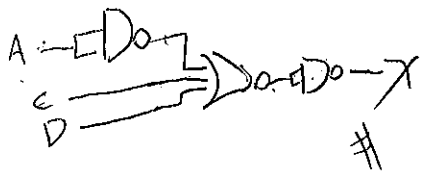
 $\bar{B}\bar{C} + \bar{A}\bar{C}D$ #

(f) $\bar{B} + \bar{B}$

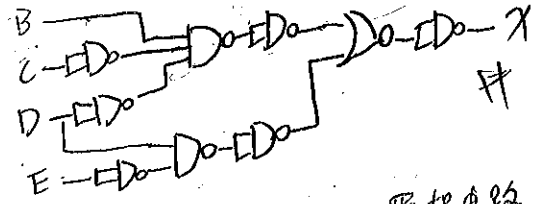
 \bar{B} #

10. 使用 NAND 閘 (NOR 閘) 或兩者組合來實現下列邏輯標式

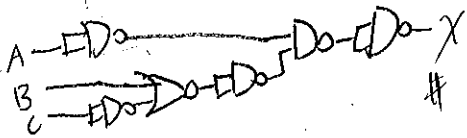
$$\begin{aligned} (a) X &= \bar{A}B + C + (\bar{A}\bar{B})(ACD + \bar{B}E) \\ &= \bar{A}B + C + (\bar{A}\bar{B})(ACD + \bar{B}E) \\ &= \bar{A}B + C + \bar{A}\bar{B} + \bar{A}\bar{B}E \\ &= \bar{A} + C \end{aligned}$$



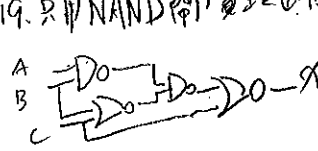
$$\begin{aligned} (b) X &= AB\bar{C}\bar{D} + D\bar{E}F + \bar{A}F \\ &= AB\bar{C}\bar{D} + D\bar{E}F + \bar{A}F \\ &= B\bar{C}\bar{D} + D\bar{E} \end{aligned}$$



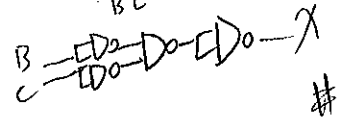
$$\begin{aligned} (c) X &= \bar{A}[B + C(CD + E)] \\ &= \bar{A}B + \bar{A}C(CD + E) \\ &= \bar{A}B + \bar{A}C \\ &= \bar{A}(B + C) \end{aligned}$$



19. 只用 NAND 閘實現出題 5-42 的邏輯電路

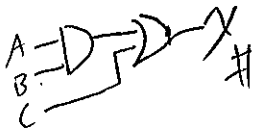
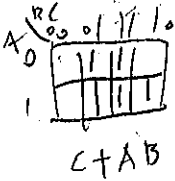


$$\begin{aligned} & \overline{ABC(B+C)} + C \\ & (\bar{A}\bar{B}(\bar{B}+C))\bar{C} \\ & ((\bar{A}+B)(\bar{B}+C))\bar{C} \\ & \bar{A}\bar{B}\bar{C} + \bar{B}\bar{C} \end{aligned}$$



11. 根據表 5-6 的真值表來實現其邏輯電路

A	B	C	X
0	0	0	0
0	0	1	1
0	1	0	1
0	1	1	1
1	0	0	1
1	0	1	1
1	1	0	1
1	1	1	1

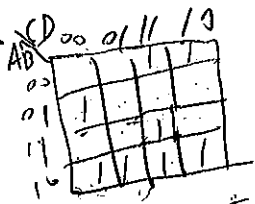


21. 只用 NOR 閘, 重做問題 19



12.

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	0
0	1	0	1	0
0	1	1	0	0
0	1	1	1	1
1	0	0	0	1
1	0	0	1	1
1	0	1	0	0
1	0	1	1	0
1	1	0	0	0
1	1	0	1	0
1	1	1	0	1
1	1	1	1	1



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

