9.18 week 3

2.13. (a) $Y = AC + \bar{A}\bar{B}C = AC(B+\bar{B}) + \bar{A}\bar{B}C = ABC + \bar{B}C$ ×

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

A \ BC	00	01	11	10
0	0	1	0	0
1	0	1	1	0

为 $AC + \bar{B}C$. 证毕.

(b) $Y = \bar{A}\bar{B} + \bar{A}B\bar{C} + \overline{(A+\bar{C})} = \bar{A}\bar{B} + \bar{A}B\bar{C} + \bar{A}C = \bar{A}(\bar{B} + B\bar{C} + C)$

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

A \ BC	00	01	11	10
0	1	1	1	1
1	0	0	0	0

$\bar{A}\bar{B}$, $\bar{A}B\bar{C}$, $\bar{A}C = \overline{A+\bar{C}}$ $\Rightarrow \bar{A}$. 证毕.

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

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

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

$= \bar{A} + A\bar{B}\bar{C} + A\bar{B}\bar{D} + ABD + B\bar{C}D$ = 原式 $+ \bar{A}\bar{B}\bar{D} + \bar{A}BD + \bar{A}\bar{B}\bar{C}$

AB \ CD	00	01	11	10
00	1	1	1	1
01	1	1	1	1
11	0	1	1	1
10	1	1	1	1

$\bar{A}$, $\bar{B}\bar{D}$, $\bar{C}D$, BD

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

$= \bar{C}(\bar{B}+B)(\bar{B}+D)$

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

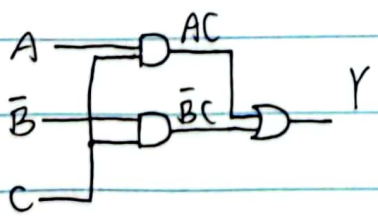
$(\bar{C}D + \bar{B})(\bar{C}D + \bar{C})$

$= (\bar{C}D + \bar{B})\bar{C}$ ×

$= (\bar{B}\bar{D} + \bar{B})(\bar{B}\bar{D} + \bar{C})$

$= \bar{B}\bar{D} + B\bar{C}$ ×

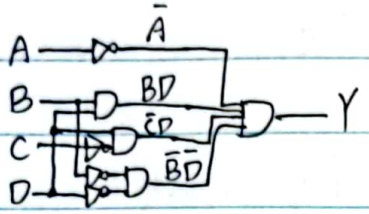
5. (a)



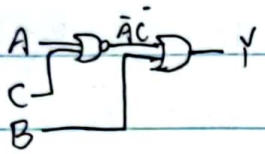
(b)

<? 还是要画未化简的？
没读太懂题目 >

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

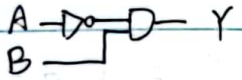


2.17. (a) $Y = BC + \bar{A}\bar{B}\bar{C} + B\bar{C} = B + \bar{A}\bar{B}\bar{C} = (B+\bar{B})(B+\bar{A}\bar{C}) = B + \bar{A}\bar{C}$



(b) $Y = \overline{A + \bar{A}B + \bar{A}\bar{B}} + \overline{A+\bar{B}} = \bar{A}(A+\bar{B})(A+B) + \bar{A}B$

$= \bar{A}(A) + \bar{A}B = \bar{A}B$



(c) $Y = ABC + ABD + ABE + ACD + ACE + \bar{A}\bar{D}\bar{E} + \bar{B}\bar{C}D + \bar{B}\bar{C}E + \bar{B}\bar{D}\bar{E} + \bar{C}\bar{D}\bar{E}$

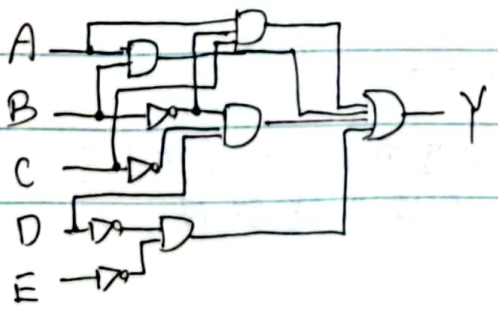
AB \ CDE	000	001	011	010	110	100	101	111
00								
01	1	1	1		1			
11			1	1	1	1	1	
10				1	1		1	1

画乱了

AB \ CDE	000	001	011	010	110	100	101	111
00	1		1	1		1		
01	1					1		
11	1	1	1	1	1	1	1	1
10	1		1	1	1	1	1	1

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

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

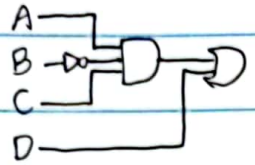


2.25. 2.24 中: $Y = \bar{A}D + A\bar{C}D + A\bar{B}C + ABCD$

$Z = BD + A\bar{C}D$

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

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



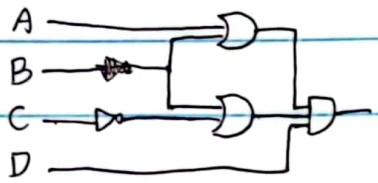
(三层门) $Z = BD + A\bar{C}D$

无法化简了

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

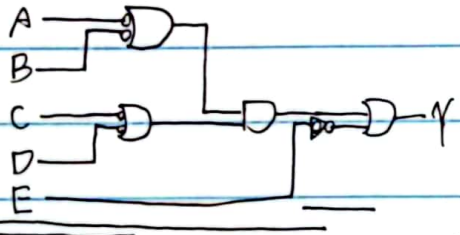
$= D(A+B)(B+\bar{C})$

AB \ CD	00	01	11	10
00	0	0	0	0
01	0	1	1	0
11	0	1	1	0
10	0	1	0	0



也是三层，但门数量比 2.24 中少了许多.

2.26. $Y = (\overline{A\bar{B}\cdot\bar{C}D})E = \overline{A\bar{B}\cdot\bar{C}D} + \bar{E} = (\bar{A}+\bar{B})(\bar{C}+\bar{D}) + \bar{E}$



2.27. $\left(\overline{(\overline{ABC})D + \overline{FG+E}}\right)(\sim) = Y$

记为 T.

$Y = \bar{T}\bar{T} = \bar{T} = \overline{(\overline{ABC})D} + \overline{FG+E}$

$Y = ABC + \bar{D} + \overline{FG}\cdot\bar{E} = ABC + \bar{D} + (\bar{F}+\bar{G})\bar{E} = ABC + \bar{D} + \bar{E}\bar{F} + \bar{E}\bar{G}$