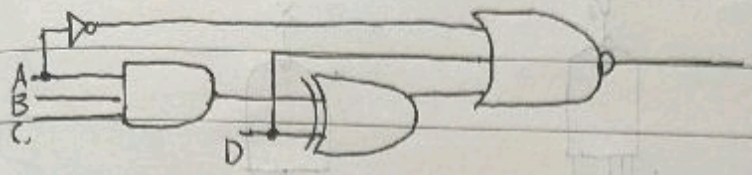
DATE 第三次.

3. $F_1 = AB + \bar{A}C + \bar{A}BD$

$F_2 = \bar{A}B\bar{D} + \bar{A}C + \bar{B}CD + A\bar{B}C\bar{D}$

4. 原式对应逻辑电路图



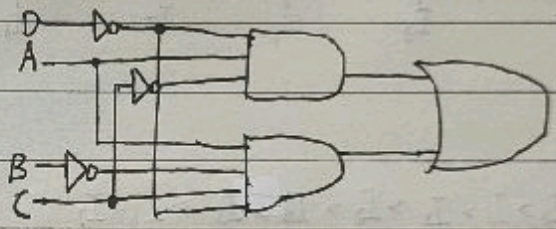
列真值表.

A	B	C	D	F
0	0	0	0	0
0	0	0	1	0
0	0	1	0	0
0	0	1	1	0
0	1	0	0	0
0	1	0	1	0
0	1	1	0	0
0	1	1	1	0
1	0	0	0	1
1	0	0	1	0
1	0	1	0	1
1	0	1	1	0
1	1	0	0	1
1	1	0	1	0
1	1	1	0	0
1	1	1	1	0

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

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

两级组合逻辑电路图.



6. 真值表.

I_0	I_1	I_2	I_3	I_4	I_5	I_6	I_7	O_0	O_1	O_2	Z
0	0	0	0	0	0	0	0	0	0	0	1
1	×	×	×	×	×	×	×	0	0	0	0
0	1	×	×	×	×	×	×	0	0	1	0
0	0	1	×	×	×	×	×	0	1	0	0
0	0	0	1	×	×	×	×	0	1	1	0
0	0	0	0	1	×	×	×	1	0	0	0
0	0	0	0	0	1	×	×	1	0	1	0
0	0	0	0	0	0	1	×	1	1	0	0
0	0	0	0	0	0	0	1	1	1	1	0

$O_0 = \bar{I}_0\bar{I}_1\bar{I}_2\bar{I}_3I_4 + \bar{I}_0\bar{I}_1\bar{I}_2\bar{I}_3\bar{I}_4I_5 + \bar{I}_0\bar{I}_1\bar{I}_2\bar{I}_3\bar{I}_4\bar{I}_5I_6 + \bar{I}_0\bar{I}_1\bar{I}_2\bar{I}_3\bar{I}_4\bar{I}_5\bar{I}_6I_7$

$O_1 = \bar{I}_0\bar{I}_1I_2 + \bar{I}_0\bar{I}_1\bar{I}_2\bar{I}_3 + \bar{I}_0\bar{I}_1\bar{I}_2\bar{I}_3\bar{I}_4\bar{I}_5I_6 + \bar{I}_0\bar{I}_1\bar{I}_2\bar{I}_3\bar{I}_4\bar{I}_5\bar{I}_6I_7$

$O_2 = \bar{I}_0I_1 + \bar{I}_0\bar{I}_1\bar{I}_2I_3 + \bar{I}_0\bar{I}_1\bar{I}_2\bar{I}_3\bar{I}_4I_5 + \bar{I}_0\bar{I}_1\bar{I}_2\bar{I}_3\bar{I}_4\bar{I}_5\bar{I}_6I_7$

$Z = \bar{I}_0\bar{I}_1\bar{I}_2\bar{I}_3\bar{I}_4\bar{I}_5\bar{I}_6\bar{I}_7$

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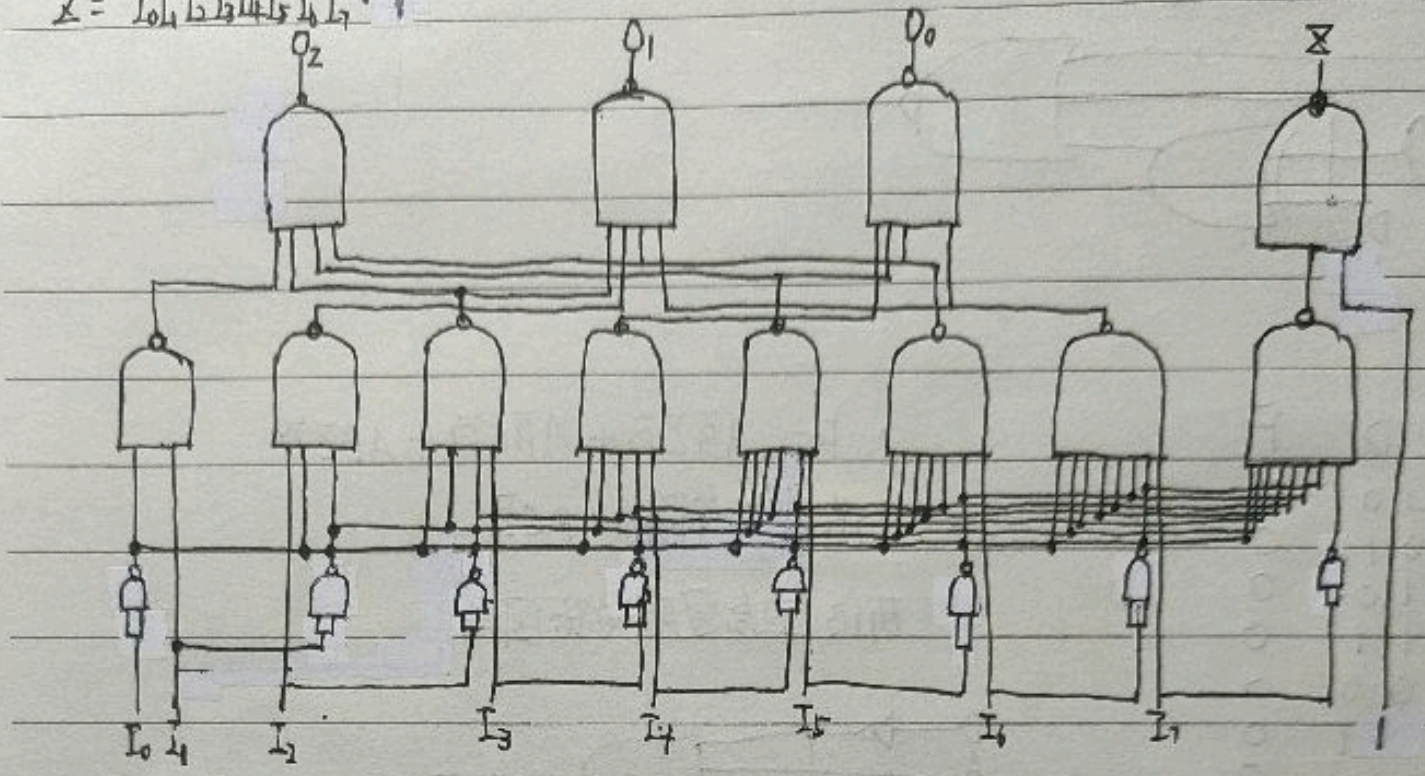
$$O_0 = \overline{\bar{I}_0 I_1 I_2 I_3 I_4} \cdot \overline{I_0 \bar{I}_1 I_2 I_3 I_4 I_5} \cdot \overline{I_0 I_1 \bar{I}_2 \bar{I}_3 I_4 I_5 I_6} \cdot \overline{\bar{I}_0 \bar{I}_1 \bar{I}_2 \bar{I}_3 \bar{I}_4 \bar{I}_5 \bar{I}_6 I_7}$$

$$O_1 = \overline{\bar{I}_0 \bar{I}_1 I_2} \cdot \overline{I_0 \bar{I}_1 \bar{I}_2 I_3} \cdot \overline{\bar{I}_0 I_1 \bar{I}_2 \bar{I}_3 I_4 I_5 \bar{I}_6} \cdot \overline{\bar{I}_0 \bar{I}_1 I_2 \bar{I}_3 I_4 \bar{I}_5 \bar{I}_6 I_7}$$

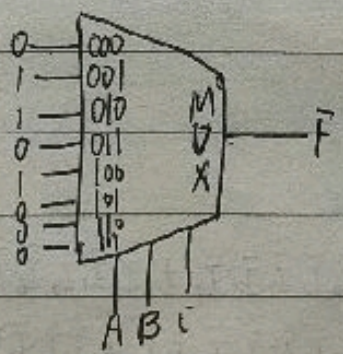
$$O_2 = \overline{\bar{I}_0 I_1} \cdot \overline{I_0 \bar{I}_1 \bar{I}_2 \bar{I}_3} \cdot \overline{\bar{I}_0 \bar{I}_1 I_2 I_3 \bar{I}_4 I_5} \cdot \overline{I_0 \bar{I}_1 \bar{I}_2 \bar{I}_3 I_4 \bar{I}_5 \bar{I}_6 I_7}$$

$$Z = \overline{\bar{I}_0 \bar{I}_1 \bar{I}_2 \bar{I}_3 \bar{I}_4 \bar{I}_5 \bar{I}_6 \bar{I}_7} \cdot 1$$

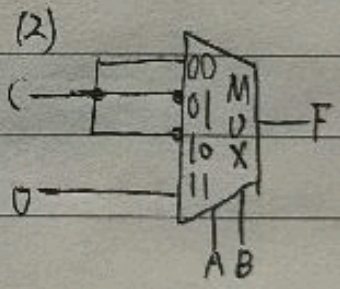


优先级顺序: $I_0 > I_1 > I_2 > I_3 > I_4 > I_5 > I_6 > I_7$

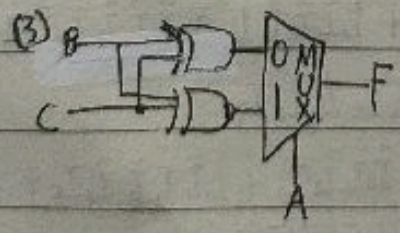
7. (1)



(2)



(3)



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9) (1)

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

→ $\bar{B}\bar{C}\bar{D}$

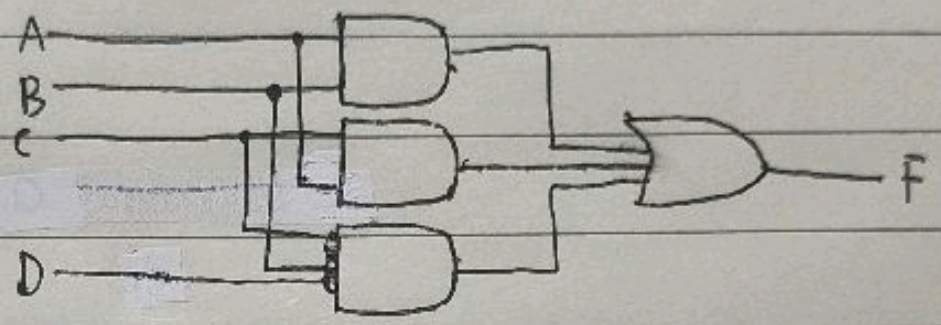
→ AC

↓

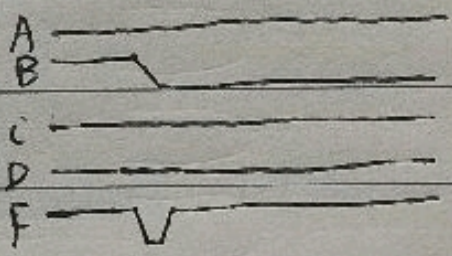
AB

∴ $F = AB + AC + \bar{B}\bar{C}\bar{D}$

(2)



(3) 有存在竞争冒险，当输入信号从 1100 变为 1000 时会出现毛刺



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11. 2.30 a) T_{pd}=95 ps T_{cd}=25 ps

b) T_{pd}=125ps T_{cd}=45ps

c) T_{pd}=100ps T_{cd}=35ps

∴ b的T_{pd}最长，a的T_{pd}最短