

一、

$$\begin{aligned}(1052.334)_8 &= (001\ 000\ 101\ 010.011\ 011\ 100)_2 \\ &= (1000101010.011011100)_2 \\ &= (0010\ 0010\ 1010.0110\ 1110)_2 \\ &= (22A.6E)_{16}\end{aligned}$$

将 $(1231.32)_4$ 转换为十进制数

$$\begin{aligned}(1231.32)_4 &= (1 \times 10^3 + 2 \times 10^2 + 3 \times 10^1 + 1 \times 10^0 + 3 \times 10^{-1} + 2 \times 10^{-2})_4 \\ &= (1 \times 4^3 + 2 \times 4^2 + 3 \times 4^1 + 1 \times 4^0 + 3 \times 4^{-1} + 2 \times 4^{-2})_{10} \\ &= (109.875)_{10}\end{aligned}$$

将 $(109.875)_{10}$ 转换为七进制数

	余数
$109 \div 7 = 15$	$a_0 = 4$
$15 \div 7 = 2$	$a_1 = 1$
$2 \div 7 = 0$	$a_2 = 2$
	整数部分
$0.875 \times 7 = 6.125$	$c_{-1} = 6$
$0.125 \times 7 = 0.875$	$c_{-2} = 0$
$0.875 \times 7 = 6.125$	$c_{-3} = 6$

即 $(1231.32)_4 = (214.6060\cdots)_7 = (214.\dot{6}\dot{0})_7$ ，结果为循环小数。

二、

$$\begin{aligned}(41)_{10} &= (101001)_2 \\ (85)_{10} &= (1010101)_2 \\ (-85)_{\text{补}} &= (10101011)_{\text{补}} \\ (41-85)_{\text{补}} &= (41)_{\text{补}} + (-85)_{\text{补}} \\ &= (101001)_{\text{补}} + (10101011)_{\text{补}} \\ &= (1101\ 0100)_{\text{补}} \\ &= (-010\ 1100)_2 \\ &= (-44)_{10}\end{aligned}$$

三、

$F = A \cdot B \cdot (B + \overline{C}) + \overline{A} \cdot C + \overline{B} \cdot C$	$F = A \cdot (A + B + C + D) \cdot (\overline{A} + D) \cdot (\overline{B} + D)$
$= AB + A\overline{B}\overline{C} + \overline{A}BC$	$= A \cdot (\overline{A} + D) \cdot (\overline{B} + D)$
$= AB + \overline{A}BC$	$= AD \cdot (\overline{B} + D)$
$= AB + C$	$= AD$

四、

$$F = \overline{\overline{AB} \cdot \overline{BC} \cdot \overline{CA}}, \text{ 真值表 (略)}$$

三变量非一致电路

五、

$B_8B_4B_2B_1$	F	$B_8B_4B_2B_1$	F
0000	0	1000	1
0001	0	1001	1
0010	0	1010	d
0011	1	1011	d
0100	1	1100	d
0101	1	1101	d
0110	1	1110	d
0111	1	1111	d

0	1	d	1
0	1	d	1
1	1	d	d
0	1	d	d

$$F = B_4 + B_8 + B_2B_1$$

电路图 (略)

$$= \overline{B_4} \cdot \overline{B_8} \cdot \overline{B_2B_1}$$

六、

$$ACD=011, F = B \cdot \overline{B}$$

$$ABD=000, F = C \cdot \overline{C}$$

$$ABC=d10, F = D \cdot \overline{D}$$

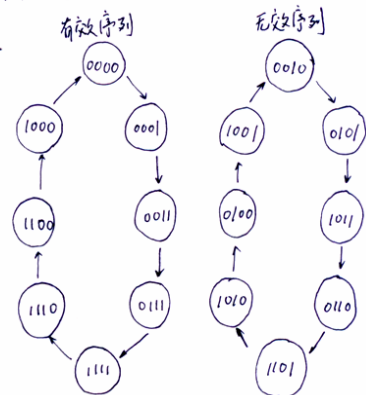
$$F = (A + B + \overline{C})(C + D)(\overline{B} + \overline{D})(A + B + D)(A + \overline{C} + \overline{D})(\overline{B} + C)$$

七、

$$D_4 = Y_3, D_3 = Y_2, D_2 = Y_1, D_1 = \overline{Y_4}$$

$$Y_4^{n+1} = D_4 = Y_3, Y_3^{n+1} = D_3 = Y_2, Y_2^{n+1} = D_2 = Y_1, Y_1^{n+1} = D_1 = \overline{Y_4}$$

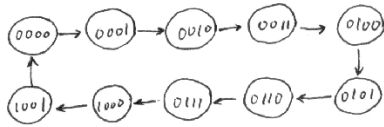
$Y_4 Y_3 Y_2 Y_1$	$Y_4^{n+1} Y_3^{n+1} Y_2^{n+1} Y_1^{n+1}$
0 0 0 0	0 0 0 1
0 0 0 1	0 0 1 1
0 0 1 0	0 1 0 1
0 0 1 1	0 1 1 1
0 1 0 0	1 0 0 1
0 1 0 1	1 0 1 1
0 1 1 0	1 1 0 1
0 1 1 1	1 1 1 1
1 0 0 0	0 0 0 0
1 0 0 1	0 0 1 0
1 0 1 0	0 1 0 0
1 0 1 1	0 1 1 0
1 1 0 0	1 0 0 0
1 1 0 1	1 0 1 0
1 1 1 0	1 1 0 0
1 1 1 1	1 1 1 0



功能为模8步进制计数器
由于无效序列构成循环,无法指向有效序列,所以出现挂起

八、

4.10 根据题意, 设状态变量用 y_3, y_2, y_1, y_0 表示, 可直接作出二进制状态图



相应的状态表为

$y_3 y_2 y_1 y_0$	$y_3^{(n+1)}$	$y_2^{(n+1)}$	$y_1^{(n+1)}$	$y_0^{(n+1)}$
0 0 0 0	0	0	0	1
0 0 0 1	0	0	1	0
0 0 1 0	0	0	1	1
0 0 1 1	0	1	0	0
0 1 0 0	0	1	0	1
0 1 0 1	0	1	1	0
0 1 1 0	0	1	1	1
0 1 1 1	1	0	0	0
1 0 0 0	1	0	0	1
1 0 0 1	0	0	0	0
1 0 1 0	d	d	d	d
⋮	⋮	⋮	⋮	⋮
1 1 1 1	d	d	d	d

根据二进制状态表和T触发器激励表,

可求出激励函数最简表达式为

$$T_3 = y_3 y_0 + y_2 y_1 y_0 \quad T_2 = y_1 y_0$$

$$T_1 = \bar{y}_3 y_0 \quad T_0 = 1$$

根据激励函数最简表达式, 可画出逻辑电路图 (同略)