# 数字电子技术第十一次作业

7.4 解：

易得 $F_1=\overline{A}\overline{B}+\overline{A}B+AB$　　$F_2=\overline{A}\overline{B}+A\overline{B}+AB$

7.5 解

将表达式分解为最小项之和

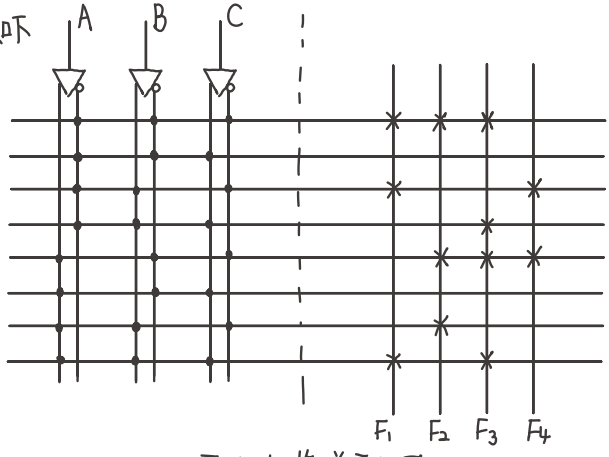
$F_1=\overline{A}\overline{C}+ABC=\overline{A}B\overline{C}+\overline{A}\overline{B}\overline{C}+ABC$

$F_2=\overline{B}\overline{C}+A\overline{C}=AB\overline{C}+\overline{A}\overline{B}\overline{C}+A\overline{B}\overline{C}$

$F_3=\overline{B}\overline{C}+BC=A\overline{B}\overline{C}+\overline{A}\overline{B}\overline{C}+ABC+\overline{A}BC$

$F_4=\overline{A}BC+A\overline{B}\overline{C}$

电路如下




7.8 解 二进制码和格雷码转换关系如下

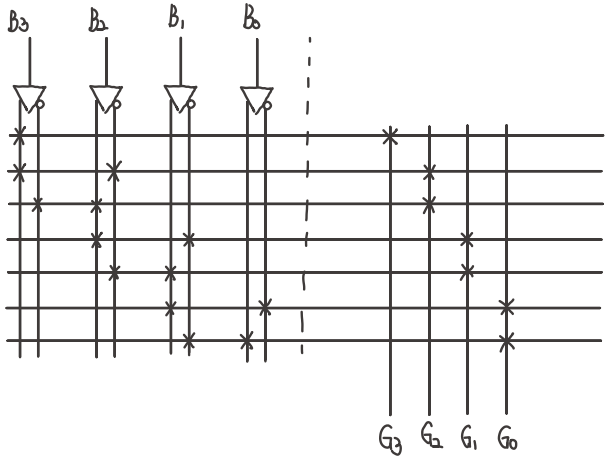
| 二进制码 $B_3B_2B_1B_0$ | 格雷码 $G_3G_2G_1G_0$ |
|---|---|
| 0000 | 0000 |
| 0001 | 0001 |
| 0010 | 0011 |
| 0011 | 0010 |
| 0100 | 0110 |
| 0101 | 0111 |
| 0110 | 0101 |
| 0111 | 0100 |
| 1000 | 1100 |
| 1001 | 1101 |
| 1010 | 1111 |
| 1011 | 1110 |
| 1100 | 1010 |
| 1101 | 1011 |
| 1110 | 1001 |
| 1111 | 1000 |

卡诺图化简后可得

$G_0 = B_1\overline{B_0} + \overline{B_1}B_0$　　$G_1 = B_2\overline{B_1} + \overline{B_2}B_1$

$G_2 = B_3\overline{B_2} + \overline{B_3}B_2$　　$G_3 = B_3$

PLA电路如下

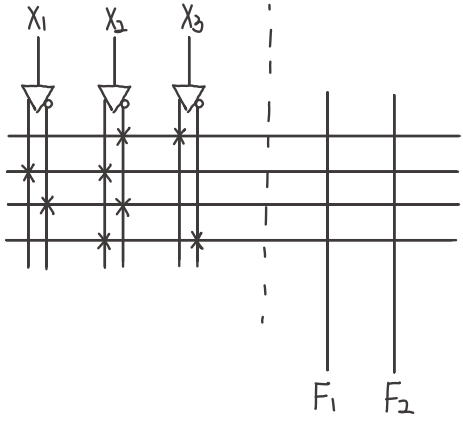



710解

卡诺图化简后得

$F_1 = X_3\overline{X_2} + X_2X_1$　　$F_2 = \overline{X_1}\overline{X_3} + X_1X_2 + \overline{X_3}X_2$

PLA电路图如下



79解 列出状态表

| 输入 | 现态 | | 次态 | | 输出 |
|---|---|---|---|---|---|
| $X$ | $Q_2^n$ | $Q_1^n$ | $Q_2^{n+1}$ | $Q_1^{n+1}$ | $Z$ |
| 0 | 0 | 0 | 0 | 1 | 0 |
| 0 | 0 | 1 | 1 | 0 | 0 |
| 0 | 1 | 0 | 1 | 1 | 0 |
| 0 | 1 | 1 | 0 | 0 | 1 |
| 1 | 1 | 1 | 1 | 0 | 0 |
| 1 | 1 | 0 | 0 | 1 | 0 |
| 1 | 0 | 1 | 0 | 0 | 0 |
| 1 | 0 | 0 | 1 | 1 | 1 |

$\therefore Q_2^{n+1} = X \oplus Q_1^n \oplus Q_2^n \quad Q_1^{n+1} = \overline{Q_1^n} \quad Z = \overline{X} Q_2^n Q_1^n + X \overline{Q_2^n}\,\overline{Q_1^n}$

$\therefore J_1 = K_1 = 1 \quad J_2 = K_2 = X\overline{Q_1^n} + \overline{X} Q_1^n$

PLA电路图如下