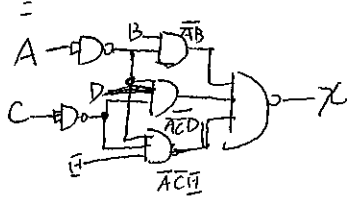


(4) 00101001 + 01001001 (兩數皆為BCD碼)的運算結果(以十六進位表示)

$$\begin{array}{r}
 0010 \quad 1001 \quad (BCD) \quad 29 \\
 0100 \quad 1001 \quad (BCD) \quad 49 \\
 \hline
 0111 \quad 0010 \quad 78 \\
 + \quad \quad 0110 \\
 \hline
 0111 \quad 1000 \quad 4EH
 \end{array}$$

(5) 請以NAND閘來實現 $X = \overline{A[B + \overline{C(D+E)}]}$

$$\begin{aligned}
 X &= \overline{A[B + \overline{C(D+E)}]} \\
 &= \overline{AB + \overline{ACD} + \overline{ACE}} \\
 &= \overline{AB + \overline{ACD} + \overline{ACE}} \\
 &= \overline{AB} \cdot \overline{\overline{ACD}} \cdot \overline{\overline{ACE}} \\
 &= \overline{AB} \cdot AC D \cdot ACE
 \end{aligned}$$



(7) 七的ASCII碼(以十六進位表示)

G = 61H
 七 = 74H

(8) 五的ASCII碼加入同位元使成為奇同位(以8位元表示)

5 = 35H
 0011 0101

(10) 30-13的2's補數減法結果(運算以二進位表示)

$$\begin{array}{r}
 30 \quad 0011110 \quad 17+18 \\
 13 \quad 0001101 \quad 010001 \\
 -13 \quad 1110011 \quad 010010 \\
 \hline
 \quad \quad 0010001 \quad 100011
 \end{array}$$

(6) 請以布林代數法則和狄摩根定理化減

(1) $\overline{AB} + A\overline{B}C + B\overline{B}C$
 $= \overline{AB} + A\overline{B}C + B\overline{B}C$
 $= \overline{AB}$

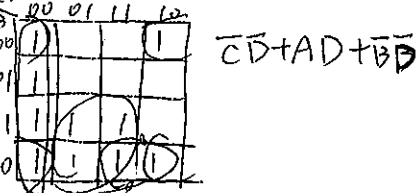
(2) $\overline{AB+AC} + \overline{A}BC$
 $= \overline{AB} \overline{AC} + \overline{A}BC$
 $= (\overline{A}+B)(\overline{A}+C) + \overline{A}BC$
 $= \overline{A}\overline{A} + \overline{A}B + \overline{A}C + B\overline{C} + \overline{A}BC$
 $= \overline{A} + B\overline{C}$

(1) 在下列各表示中應用狄摩根定理

$$\begin{aligned}
 &\overline{(\overline{A+B+C+D})(\overline{AB} \overline{C} \overline{D})} \\
 &= \overline{(\overline{A+B+C+D}) + (\overline{AB} \overline{C} \overline{D})} \\
 &= \overline{A+B+C+D} + \overline{AB} \overline{C} \overline{D} \\
 &= \overline{A} + \overline{B} + \overline{C} + \overline{D}
 \end{aligned}$$

$$\begin{aligned}
 &\overline{\overline{AB} \overline{C} \overline{D} \overline{E} \overline{F}} \overline{(\overline{AB} + \overline{CD})} \\
 &= \overline{\overline{AB} + \overline{C} \overline{D} \overline{E} \overline{F}} + \overline{(\overline{AB} + \overline{CD})} \\
 &= \overline{AB} + \overline{C} \overline{D} \overline{E} \overline{F} + \overline{AB} \overline{CD} \\
 &= \overline{AB} + (\overline{C} + \overline{D})(\overline{E} + \overline{F}) \overline{AB} \overline{CD} \\
 &= \overline{AB} + (\overline{C} + \overline{D})(\overline{E} + \overline{F})
 \end{aligned}$$

(2) 利用卡諾圖求出 $F(A,B,C,D) = \sum(0, 2, 4, 8, 9, 10, 11, 12, 13, 15)$ 最簡化的SOP形式



(4) 利用卡諾圖求出 $G(A,B,C,D) = \sum(1, 3, 4, 6, 7, 9, 11, 12)$ 最簡化的POS形式

