Nome: Helder Henrique da Silva   RA: 20250326

① 1. 326_8 para base 6

$326_8 = 3.8^2 + 2.8^1 + 6.8^0 = 214_{10}$

$$\begin{array}{c|c}
214 & 6 \\
4 & 35 \;|\;6 \\
& 5 \quad 5
\end{array}$$

$\therefore \boxed{326_8 = 554_6}$

2- $4132,21_6$ para base 10

$4132,21_6 = 4.6^3 + 1.6^2 + 3.6^1 + 2.6^0 + 2.6^{-1} + 1.6^{-2} =$

$\therefore \boxed{4132,21_6 = 920,36\overline{11}}$

3- 3412_{10} para base 2

$$\begin{array}{c|c}
3412 & 2 \\
0 \quad 1706 & 2 \\
0 \quad 853 & 2 \\
1 \quad 426 & 2 \\
0 \quad 213 & 2 \\
1 \quad 106 & 2 \\
0 \quad 53 & 2 \\
1 \quad 26 & 2 \\
0 \quad 13 & 2 \\
1 \quad 6 & 2 \\
0 \quad 3 & 2 \\
& 1 \quad 1
\end{array}$$

$\therefore \boxed{3412_{10} = 110101010100_2}$

4. $7ACD_{16}$ para a base 2

7	A	C	D_{16}
↓	↓	↓	↓
0111	1010	1100	1101_2

② 1. -12 em complemento de 2, utilizando 8 bits

$12 =$ 0 0001100

$-12 =$ 1 1 1 1 0 0 1 1
          $+$ 1
          ─────────────────
          1 1 1 1 0 1 0 0

$\therefore$ $\boxed{-12 = 11110100}$

2. -145 em complemento de 1, utilizando 12 bits

```
145 |2
 1   72 |2
      0  36 |2
          0  18 |2
              0  9 |2
                  1  4 |2
                      0  2 |2
                          0  1
```

$145 = 000100010001$

$\boxed{-145 = 111101101110}$

③ $f(A,B,C,D) = (A+\bar{B}+C) \cdot (\bar{B}+\bar{D})(\bar{A}+\bar{C})(B+C)$

$(A+\bar{B}+C) \cdot (\bar{B}+\bar{D}) \cdot (\bar{A}B + \bar{A}C + \bar{C}B + \bar{C}C)^0$

$(A+\bar{B}+C) \cdot (\cancel{\bar{B}\bar{A}B}^0 + \bar{B}\bar{A}C + \cancel{\bar{B}\bar{C}B}^0 + \bar{D}\bar{A}B + \bar{D}\bar{A}C + \bar{D}\bar{C}B) \Rightarrow$

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

$\cancel{A\bar{B}\bar{A}C}^0 + \cancel{A\bar{D}\bar{A}B}^0 + \cancel{A\bar{D}\bar{A}C}^0 + A\bar{D}\bar{C}B +$

$+ \bar{B}\bar{B}\bar{A}C + \cancel{\bar{B}\bar{D}\bar{A}B}^0 + \bar{B}\bar{D}\bar{A}C + \cancel{\bar{B}\bar{D}\bar{C}B}^0 +$
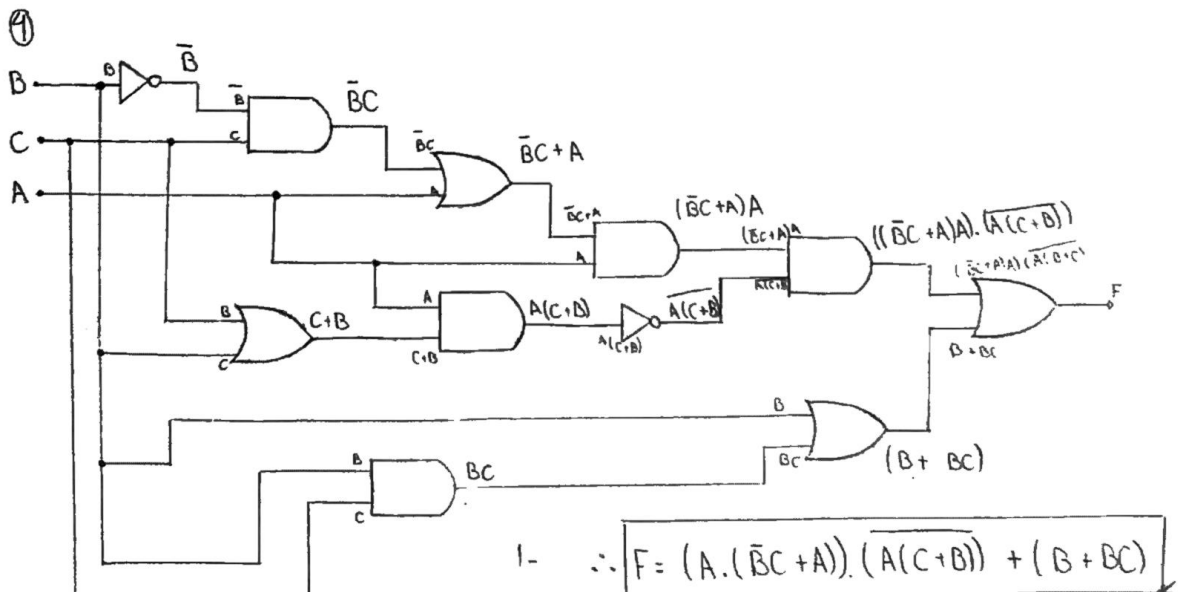
$+ C\bar{B}\bar{A}C + C\bar{D}\bar{A}B + C\bar{D}\bar{A}C + \cancel{C\bar{D}\bar{C}B}^0 \Rightarrow$

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

$A\bar{D}\bar{C}B + \bar{B}\bar{A}C \underbrace{(1+1+\bar{D})}_{1} + C\bar{D}\bar{A} \underbrace{(1+B)}_{1}$

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

$\therefore \boxed{f(A,B,C,D) = AB\bar{C}\bar{D} + \bar{A}\bar{B}C + \bar{A}C\bar{D}}$

④

$1 - \quad \therefore \boxed{F = (A \cdot (\bar{B}C+A)) \cdot (\overline{A(C+B)}) + (B + BC)}$

2. $F = (A(\bar{B}C + A)) \cdot \overline{(\bar{A}(C+\bar{B})} + (B + BC)$

$(A\bar{B}C + A\!\!\!/\!A) \cdot (\bar{A} + \overline{(C+\bar{B})}) + B(\not{1}+C)$

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

$(A(\not{1}+\bar{B}C)) \cdot (\bar{A} + \bar{C}B) + B$ $\overset{\to X}{\quad} \Rightarrow B + \bar{B}X = B + X$

$A\!\!\!/\!A + A\bar{C}\bar{B} + B \qquad \Rightarrow B + \bar{B}(A\bar{C}) \Rightarrow B + A\bar{C}$

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

⑤ $f(A,B,C,D,E) = \sum_m (1,4,6,10,20,22,24,26) + d(0,11,16,17)$

↗ABC̄Ē $\bar{B}\bar{C}D$

↳ B̄C̄DĒ)
↳ B̄CĒ

$$\therefore \boxed{f(A,B,C,D) = AB\bar{C}\bar{E} + \bar{B}\bar{C}D\bar{E} + \bar{B}C\bar{E} + \bar{B}\bar{C}D}$$

⑥ 1- $f(A,B,C,D) = \overline{\bar{A}\bar{B}C} + AB\bar{D} + BCD$ em produto de maxitermos

$\overline{(\bar{A}\bar{B}C)} \cdot \overline{(AB\bar{D})} \cdot \overline{(BCD)} \Rightarrow \overline{(\bar{A}\bar{B}C)}(D+\bar{D}) \cdot \overline{(AB\bar{D})}(C+\bar{C}) \cdot \overline{(BCD)}(A+\bar{A})$

$\Rightarrow \overline{(\bar{A}\bar{B}CD)} + \overline{(\bar{A}\bar{B}C\bar{D})} \cdot \overline{(AB\bar{D}C)} + \overline{(AB\bar{D}\bar{C})} \cdot \overline{(BCDA)} + \overline{(BCD\bar{A})}$

$\Rightarrow$

$\Rightarrow \overline{(\overline{A}\overline{B}CD) \cdot (\overline{A}\overline{B}C\overline{D}) \cdot (AB\overline{D}C) \cdot (AB\overline{D}\overline{C}) \cdot (ABCD) \cdot (\overline{A}BCD)}$

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

$\therefore \boxed{f(A,B,C,D) = \Pi M (2,3,7,12,14,15)}$

2- $f(A,B,C,D) = \overline{A(\overline{B}+C\overline{D})} + \overline{A}BC$ em   soma   de   mintermos

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

$\overline{A} + (\overline{\overline{B}} \cdot \overline{C\overline{D}}) + \overline{A}BC$

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

$\overline{A} + B\overline{C} + BD + \overline{A}BC$

$\overline{A}(1+BC) + B\overline{C} + BD$

$\therefore \overline{A} + B\overline{C} + BD$

$\boxed{f(A,B,C,D) = \Sigma m (0,1,2,3,4,5,6,7,12,13,15)}$