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Đề 02

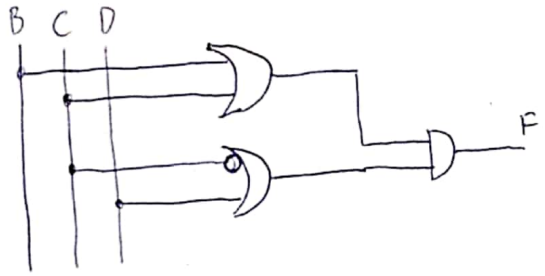
①

$F(A,B,C,D) = M(0,1,2,6,14,10) \cdot D(8,9)$

a)

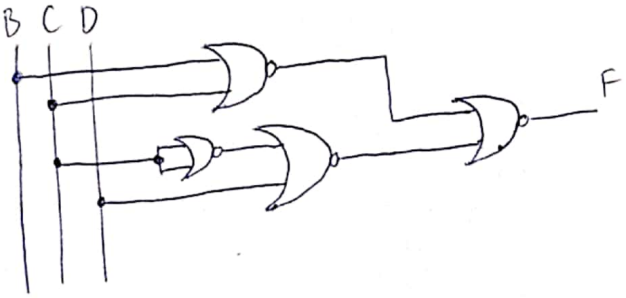
F	CD 00	01	11	10
AB 00	0	0	1	0
01	1	1	1	0
11	1	1	1	0
10	d	d	1	0

$F = (B+C)(C'+D)$



b)

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



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②

Bảng chân lý:

A	B	C	D	X	Y	Z
0	0	0	0	0	0	0
0	0	0	1	0	0	0
0	0	1	0	0	0	0
0	0	1	1	0	0	0
0	1	0	0	1	0	0
0	1	0	1	0	0	1
0	1	1	0	0	0	1
0	1	1	1	1	0	0
1	0	0	0	0	0	1
1	0	0	1	0	0	1
1	0	1	0	0	1	0
1	0	1	1	0	1	0
1	1	0	0	0	0	1
1	1	0	1	0	0	1
1	1	1	0	0	0	1
1	1	1	1	0	0	1

X

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

$X = A'BC'D' + A'BCD$

$= A'B(C'D + CD)$

Y

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

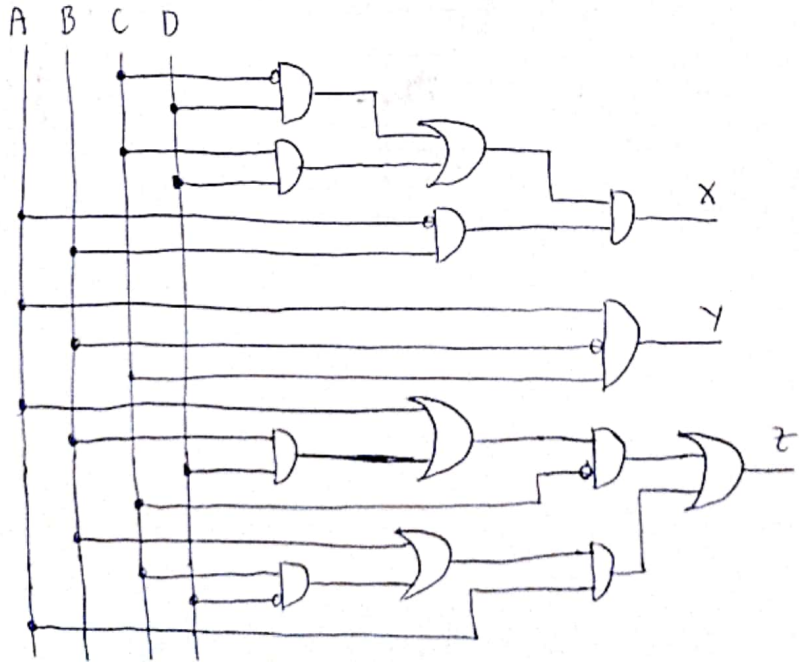
$Y = AB'C$

Z

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

$Z = AC' + AB + BC'D + ACD'$

$= C'(A + BD) + A(B + CD')$



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③

a) $AC' + A'B' = ABC' + B'C' + A'B'C$

Xét VP $= ABC' + B'C' + A'B'C$

$= ABC'D + ABC'D' + AB'C'D + A'B'C'D + AB'C'D' + A'B'C'D' + A'B'CD + A'B'CD'$ (Bù)

$= AC'(BD + BD' + B'D + B'D') + A'B'(C'D + C'D' + CD + CD')$ (Phân phối)

$= AC' + A'B'$ (Bù)

$=$ VT (đt pcm)

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b) $AC + A'B'C + BC = C$

Xét VT $= AC + A'B'C + BC$

$= C(A + A'B' + B)$ (phân phối)

$= C \cdot 1 = C$

$=$ VP (ctpcm)

c) $(A' + B + C')(A + B' + C)(A + C' + D) = B'C' + AB + A'CD$

Xét VT $= (A' + B + C')(A + B' + C)(A + C' + D)$

$= (A'B' + A'C + AB + BC + AC' + B'C')(A + C' + D)$ (phân phối)

$= A'B'C' + A'B'D + A'CD + AB + ABC' + ABD + ABC + BCD + AC' + AC'D + AB'C' + B'C' + B'C'D$ (phân phối)

$= A'B'C' + A'B'D + A'CD + ABC' + ABD + ABC + BCD + AC'D + AB'C' + B'C'D + AB + AC' + B'C'$ (luỹ đẳng)

$= \cancel{B'C'(A' + A + D + 1)} + \cancel{AB(C' + D + C + 1)} + \cancel{AC'} + \cancel{A'CD} + \cancel{BCD} + \cancel{AC'D}$

$= B'C'(A' + A + D + 1) + AB(C' + D + C + 1) + AC'(B + D + B' + 1) + A'B'D + A'CD + CBD$ (phân phối)

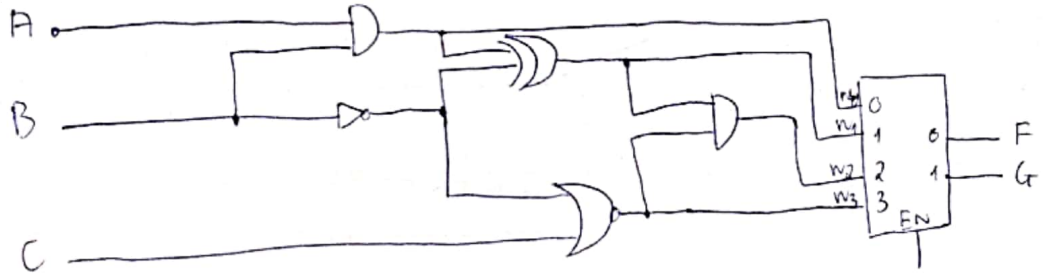
$= B'C' + AB + AC' + A'B'D + A'CD + BCD$ (bù)

$= B'C' + AB + AC' + A'B'CD + A'B'C'D + ABCD + A'BCD + A'CD$ (bù)

$= B'C'(1 + A'D) + AB(1 + CD) + A'CD(B' + B + 1)$ (phân phối)

$= B'C' + AB + A'CD =$ VP (ctpcm)

④



$w_0 = AB$ $w_1 = A'B' + AB + B'$ $w_2 = ABC'$ $w_3 = BC'$

Do EN = 1, ta có bảng chân lý:

w_3	w_2	w_1	w_0	F	G
0	0	0	1	0	0
0	0	1	0	0	1
0	1	0	0	1	0
1	0	0	0	1	1

F	w_1w_0 00	01	11	10
w_3w_2 00	d	0	d	0
01	1	d	d	d
11	d	d	d	d
10	1	d	d	d

$F = w_2 + w_3$

$= ABC' + BC'$

$\Rightarrow F(A,B,C) = \sum m(2,6)$

G	w_1w_0 00	01	11	10
w_3w_2 00	d	0	d	1
01	0	d	d	d
11	d	d	d	d
10	1	d	d	d

$G = w_3 + w_1$

$= BC' + A'B' + AB + B'$

$\Rightarrow G(A,B,C) = \sum m(0,1,2,4,5,6,7)$

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