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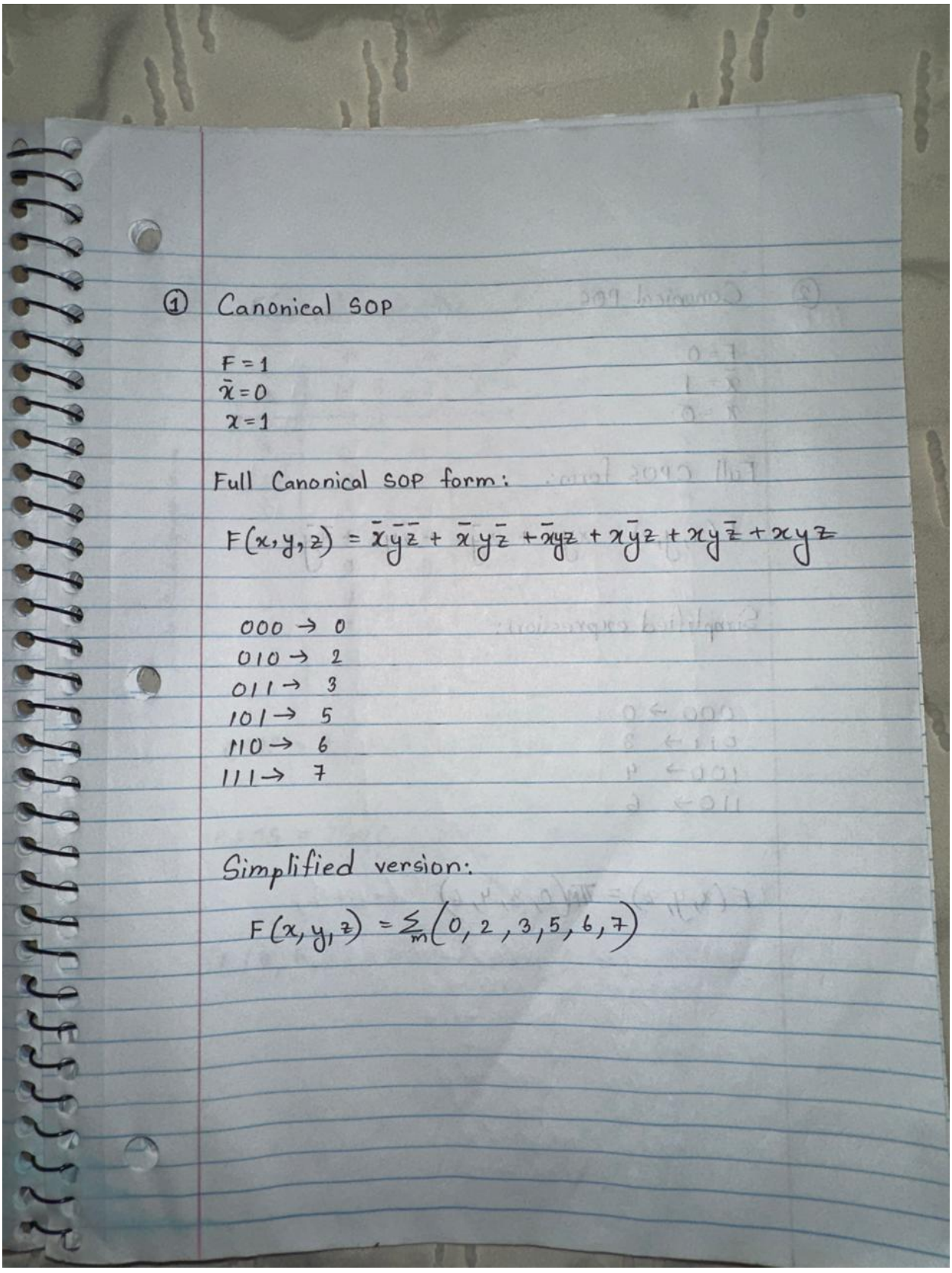


① Canonical SOP

$F = 1$
$\bar{x} = 0$
$x = 1$

Full Canonical SOP form:

$$F(x,y,z) = \bar{x}\bar{y}\bar{z} + \bar{x}y\bar{z} + \bar{x}yz + x\bar{y}z + xy\bar{z} + xyz$$

000 → 0
010 → 2
011 → 3
101 → 5
110 → 6
111 → 7

Simplified version:

$$F(x,y,z) = \sum_m (0,2,3,5,6,7)$$

② Canonical POS

$F = 0$
$\bar{x} = 1$
$x = 0$

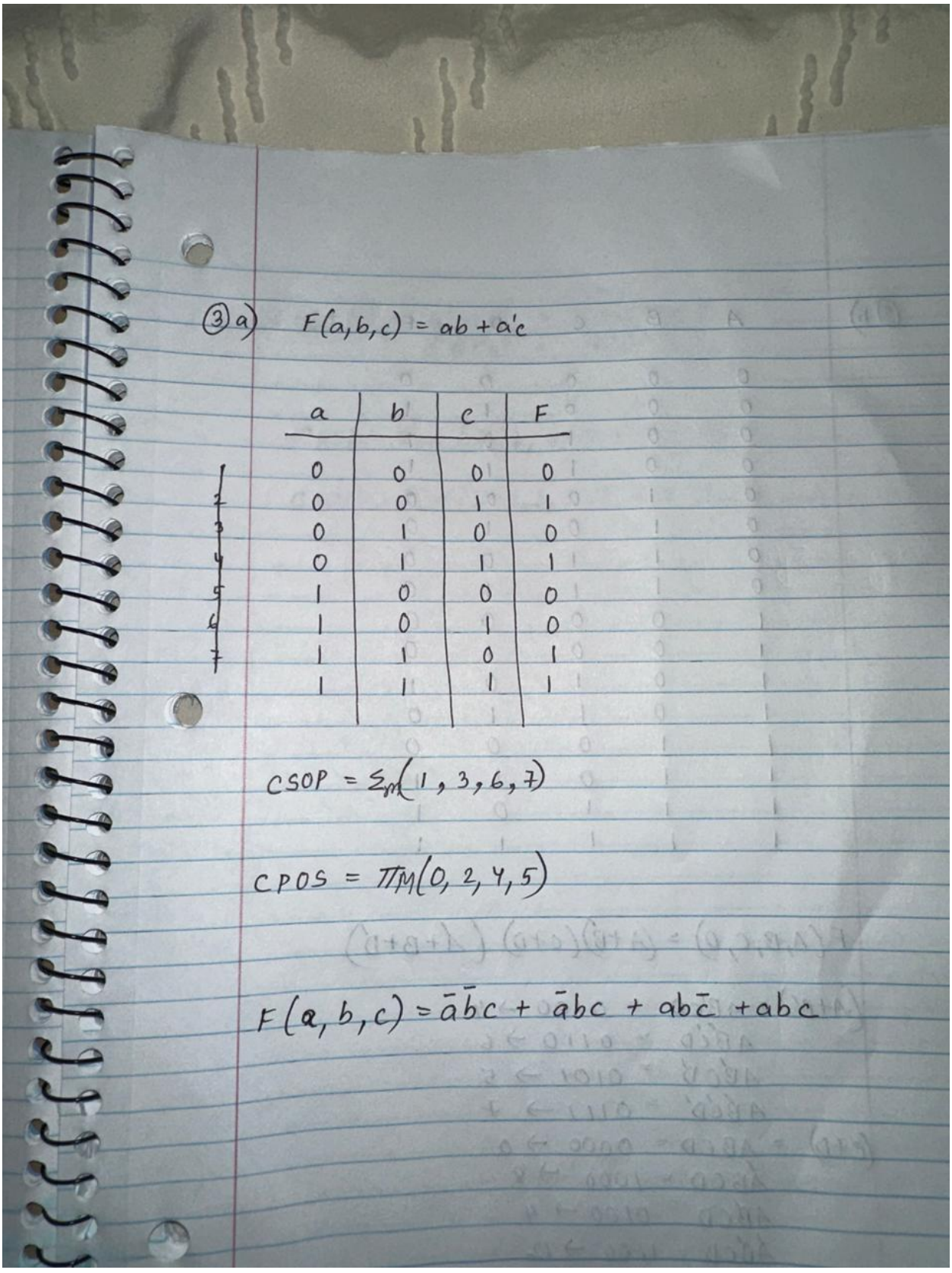
Full CPOS form:

$$F(x, y, z) = xyz + x\bar{y}\bar{z} + \bar{x}yz + \bar{x}\bar{y}z$$

Simplified expression:

000 → 0
011 → 3
100 → 4
110 → 6

$$F(x, y, z) = \Pi M(0, 3, 4, 6)$$



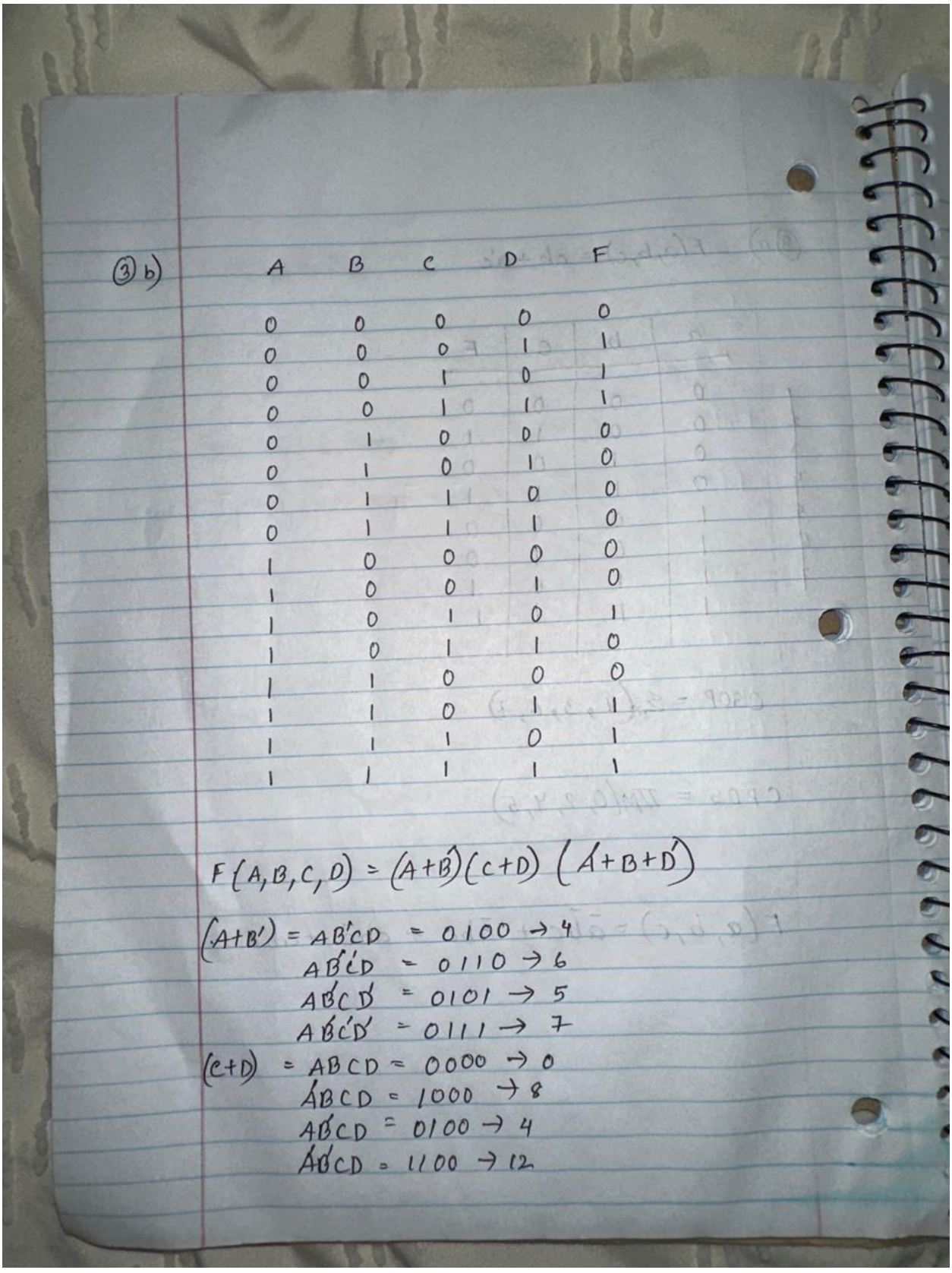
③ a) $F(a,b,c) = ab + a'c$

	a	b	c	F
1	0	0	0	0
2	0	0	1	1
3	0	1	0	0
4	0	1	1	1
5	1	0	0	0
6	1	0	1	0
7	1	1	0	1
	1	1	1	1

CSOP = $\Sigma_m(1, 3, 6, 7)$

CPOS = $\Pi M(0, 2, 4, 5)$

$F(a,b,c) = \bar{a}\bar{b}c + \bar{a}bc + ab\bar{c} + abc$



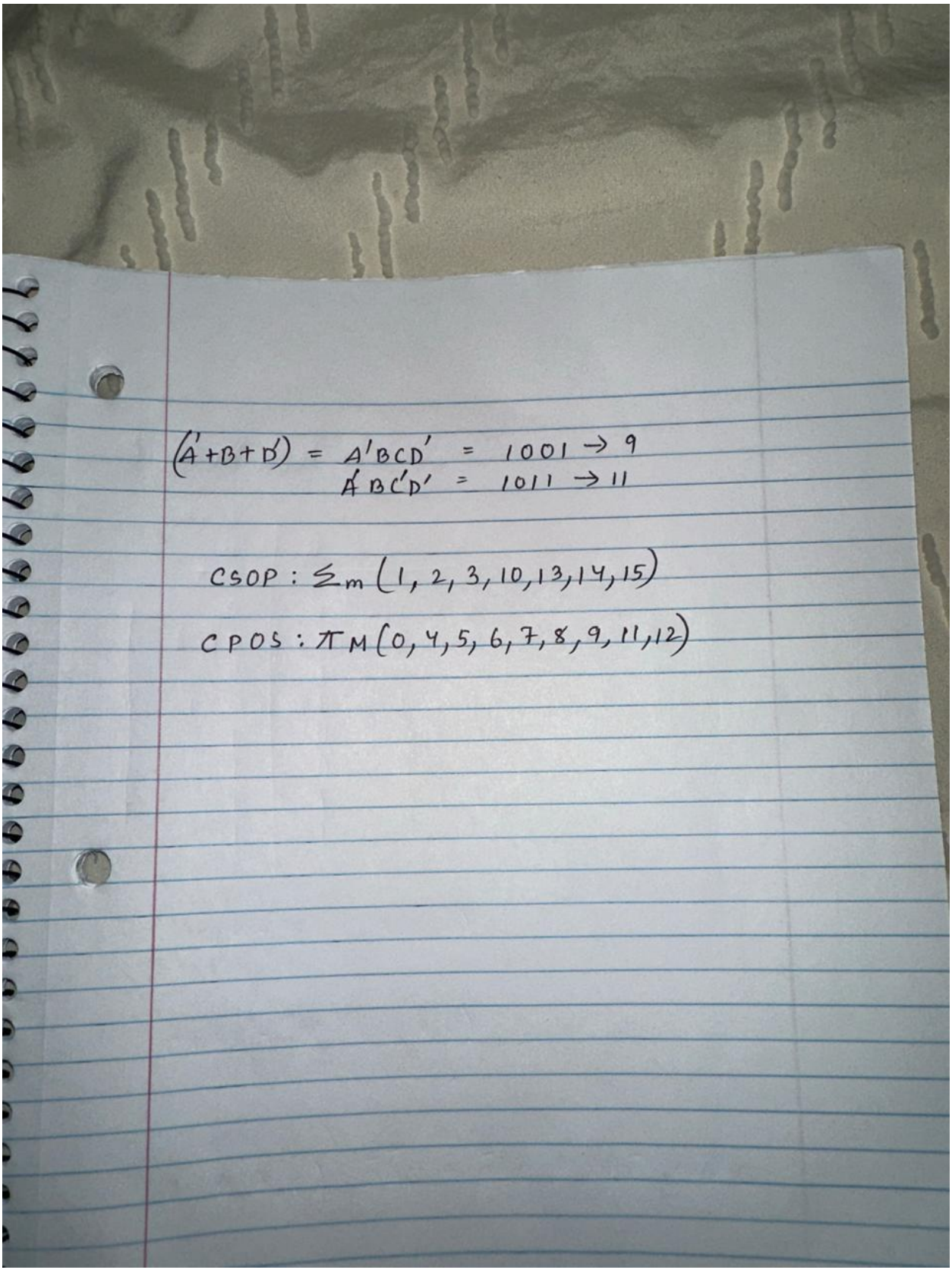
③ b)

A	B	C	D	F
0	0	0	0	0
0	0	0	1	1
0	0	1	0	1
0	0	1	1	1
0	1	0	0	0
0	1	0	1	0
0	1	1	0	0
0	1	1	1	0
1	0	0	0	0
1	0	0	1	0
1	0	1	0	1
1	0	1	1	0
1	1	0	0	0
1	1	0	1	1
1	1	1	0	1
1	1	1	1	1

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

$(A+\bar{B}) = A\bar{B}CD = 0100 \rightarrow 4$
$A\bar{B}\bar{C}D = 0110 \rightarrow 6$
$A\bar{B}C\bar{D} = 0101 \rightarrow 5$
$A\bar{B}\bar{C}\bar{D} = 0111 \rightarrow 7$

$(C+D) = ABCD = 0000 \rightarrow 0$
$\bar{A}BCD = 1000 \rightarrow 8$
$AB\bar{C}D = 0100 \rightarrow 4$
$\bar{A}B\bar{C}D = 1100 \rightarrow 12$



$(A'+B+D') = A'BCD' = 1001 \rightarrow 9$

$A'BC'D' = 1011 \rightarrow 11$

CSOP : $\Sigma m(1, 2, 3, 10, 13, 14, 15)$

CPOS : $\pi M(0, 4, 5, 6, 7, 8, 9, 11, 12)$