① $\overline{\overline{A} \cdot B\overline{C} \cdot \overline{C\overline{D}} + BC}$

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

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

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

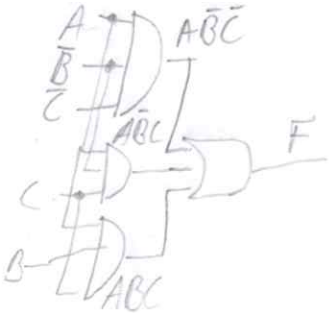
$\overline{\overline{A} \cdot B(\overline{C} + C) + \overline{D}}$

$\boxed{\overline{\overline{A} \cdot B + \overline{D}}}$

②

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

$F = A\bar{B}\bar{C} + A\bar{B}C + ABC$



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③ $(A+\bar{B})(B+C)$

Domain = ABC

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

$POS = (A+\bar{B}+C\bar{C})(B+C+A\bar{A})$

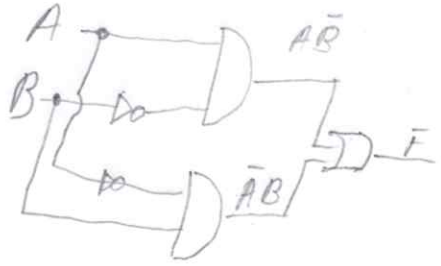
$= (A+\bar{B}+C)(A+\bar{B}+\bar{C})(A+B+C)(\bar{A}+B+C)$

---

④ XOR

A	B	F
0	0	0
0	1	1
1	0	1
1	1	0

$\bar{A}B$
$A\bar{B}$

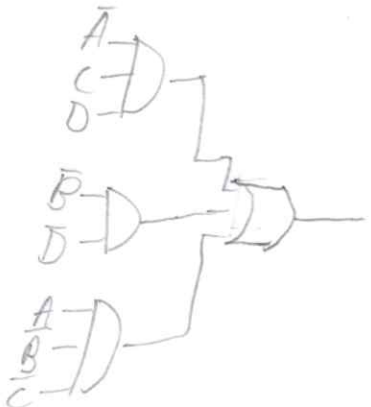


① $F(A,B,C,D) = \Sigma(m_0, m_1, m_2, m_3, m_8, m_9, m_{10})$

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

SOP

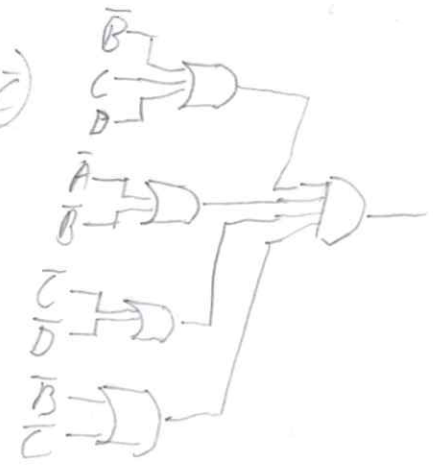
$\bar{A}CD + \bar{B}\bar{D} + A\bar{B}\bar{C}$



POS

$B\bar{C}\bar{D} + AB + CD + BC$

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



②

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

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