①

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

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

② $\overline{(A\bar{B})(\bar{C}\bar{D})} + (\bar{D}+\bar{E})$

$(AB).(CD) + (\bar{D}+\bar{E})$

③

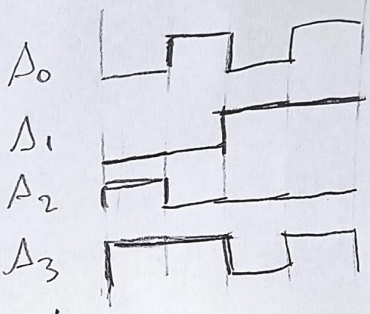
	00	01	11	10
00		1		
01				
11	1			
10			1	1

$A_3\bar{A}_2A_1\bar{A}_0$

$A_3A_2\bar{A}_1\bar{A}_0$

$\bar{A}_3\bar{A}_2\bar{A}_3A_0$

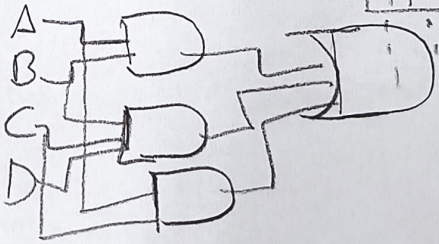
$A_3\bar{A}_2A_1A_0$



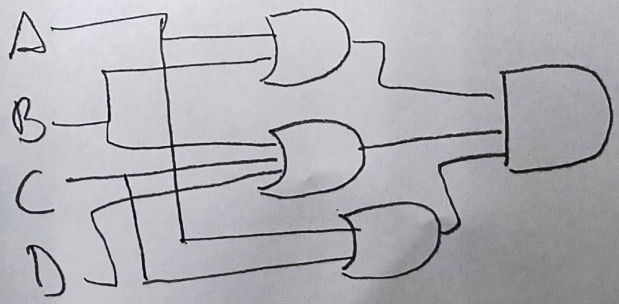
A	B	C	D	S
0	0	0	0	
0	0	0	1	1
0	0	1	0	
0	0	1	1	
0	1	0	0	
0	1	0	1	
0	1	1	0	
0	1	1	1	
1	0	0	0	
1	0	0	1	
1	0	1	0	1
1	0	1	1	1
1	1	0	0	1

④ a) $X = AB + BCD + AC = 1$

AB \ CD	00	01	11	10
00				
01				
11				
10				



b) $X = (A+B)(B+C+D)(A+C) = 0$



⑥ $S = (\bar{A}\bar{B}\bar{C}) + (A\bar{B}\bar{C}) + (AB\bar{C}) + (\bar{A}\bar{B}C) + (ABC)$

000 100 110 001 111

A \ BC	00	01	11	10
0	1	1		
1	1		1	1

$\rightarrow \bar{B}\bar{C} + \bar{A}\bar{B} + AB$

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⑦

```
  1 1
  1101
+ 1011
 11000
```