

A=1  
A'=0

4.13

f(z)

(A+B)(C+D) prod. of sum

AB + CD sum of prod.

A	B	C	D	Z
0	0	0	0	0
0	0	0	1	0
0	0	1	0	0
0	0	1	1	0
0	1	0	0	0
0	1	0	1	0
0	1	1	0	0
0	1	1	1	1
1	0	0	0	1
1	0	0	1	0
1	0	1	0	0
1	0	1	1	0
1	1	0	0	0
1	1	0	1	0
1	1	1	0	1
1	1	1	1	1

→ A'B'C'D' → (A+B+C+D)  
A'B'C'D

A'B'C'(B+D)

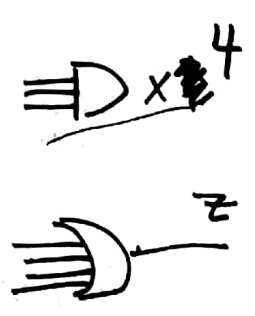
$$Z = A'B'C'D + A'B'C'D + A'B'CD + AB'C'D + ABCD' + ABCD$$

A'BCD  
AB'C'D'

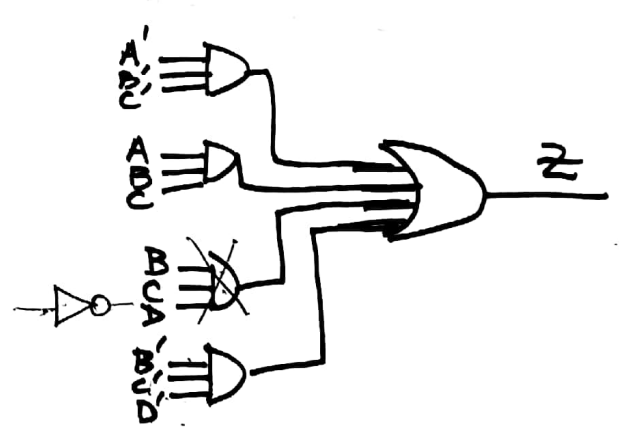
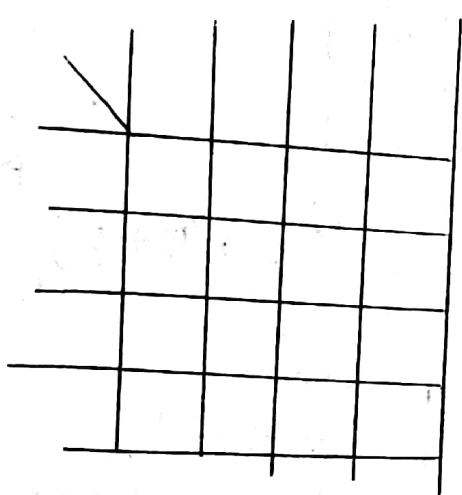
$$Z = A'B'C' + ABC + A'(BCD) + A'B'C'D' + BCD + B'C'D'$$

$$Z = A'B'C' + ABC + BCD + B'C'D'$$

ABCD'  
ABCD



5.6a



$$2^0 = 1 \quad 2^1 = 2 \quad 2^2 = 4 \quad 2^3 = 8$$

5.6 ~~Min~~ c

$$f(a,b,c,d) = \prod M(5,7,13,14,15) \cdot \prod D(1,2,3,9)$$

ab \ cd	00	01	11	10
00	1	1	1	1
01	X	0	0	X
11	X	0	0	1
10	X	1	0	1

Annotations:  $c'd'$ ,  $ab'$ ,  $a'd'$

5.14 e  $f_5(n,p,q) = \sum_{m(1,3,4,5)} 1$

pq \ n	0	1
00	0	1
01	1	1
11	1	0
10	0	0

Annotations:  $n'q$ ,  $f(n,p,q) = n'p' + n'q$

5.15 f

prod. of sum

$$f(a,b,c,d) = c'd' + ab' + a'd'$$

$n=0, n'=1$


5.14 f  $f(x,y,z) = \prod M(1,7)$


pq \ n	0	1
00	0	1
01	1	1
11	1	0
10	0	0

Annotations:  $(n'+p')$ ,  $(n+q)$

$$f(n,p,q) = (n'+p')(n+q)'$$

sum of prod.  $m=1$   
 $\rightarrow M=0$

prod of sum  $m=0$   
 $M=1$