数电第二章作业　1904102　方亮　自动化1班

2.2.(1) $AB'+B+A'B=AB'+(A'+A)B+A'B=A(B'+B)+A'B=A+A'B=A+B$

(2) 记E=左式，F=右式.

$E'=A'C+B'D'+B'D=A'C+B'$；$F'=(A'+B')(B'+C)=A'C+B'$

故$E'=F'$ 故$E=F$ 故成立

(4) 记E=左式，F=右式.

$E'=(A+B+C)\cdot(A'+B'C')(B+C')=(A+B+C)(A'B'+A'C+BC')$

$=AB'C'+A'BC'+A'B'C=[(AB'C'+A'B'C+A'BC')']'$ 故成立.

2.6.(a) $Y=[(AB')'(A'B)']'=A\oplus B$

(b) $Y=[(A\oplus B)+(B'C)']'=ABC'$

2.8

A	B	C	Y
0	0	0	0
0	0	1	0
0	1	0	0
0	1	1	1
1	0	0	0
1	0	1	1
1	1	0	1
1	1	1	0

$Y=A'BC+AB'C+ABC'$

2.10.(1) $Y=A'B(+AC(B+B')+(A+A')B'C=A'B'C+A'BC+AB'C+ABC$.

(2) $Y=AB'C'D+(A+A')BCD+A'(B+B')(C+C')D=A'B'C'D+A'B'CD+A'BC'D+A'BCD+AB'C'D+ABCD$.

(3) $Y=AB'C'D'+AB'C'D+AB'CD'+AB'CD+ABC'D'+ABC'D+ABCD'+ABCD+A'BC'D'+A'BC'D+A'BCD'+A'BCD+A'B'CD$

(4) $Y=ABC'D'+ABC'D+ABCD'+ABCD+A'BCD'+A'BCD+AB'CD+A'B'CD$

2-12 (1) $ACD+D'=D'$

(2) $AB'+AC+BC=AB'+BC$

(5) $E'F'+E'F+EF'+EF=1$

(7) $A'BC+(A+B')C=A'BC+A(B+B')C+B'C=(A'+A)BC+AB'C+B'C=C$

2-13 (2) $Y=AB'C+A'+B+C'=AB'C+A'(BC+B'C'+BC'+B'C)+B+C'$

$=B'C+B+C'=B'C+B(C+C')+C'=C'+C=1$

(4) $Y=AB'CD+ABD+AC'D=AB'CD+ABCD+ABC'D+AC'D$

$=ACD+AC'D=AD$

(6) $Y=AC(C'D+A'B)+BC((B'+AD)'+(E)'$

$=BC(B'+AD)\cdot(C'+E')=ABCDE'$

(8) $Y=A+(B+C)'(A+B'+C)(A+B+C)=A+B'C(B'+C)(B+C)$

$=A+B'C$

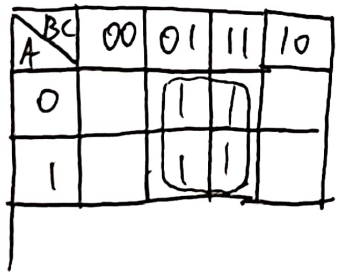
(9) $Y=AC+AC'D+AB'E'F+B(D\oplus E)+BC'DE'+BC'D'E+ABE'F$

$=AC+AC'D+A(B'+B)E'F+B(D\oplus E)+BC'(D\oplus E)$

$=AC+AC'D+AE'F+B(D\oplus E)=AC+ACD+AC'D+AE'F+B(D\oplus E)$

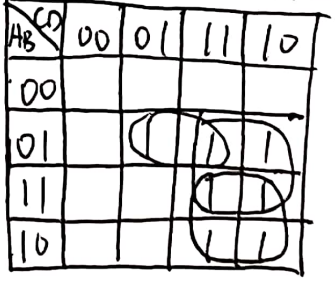
$=AC+AD+AE'F+B(D\oplus E)$

2-15 (1) $Y_1=C+ABC=C$.

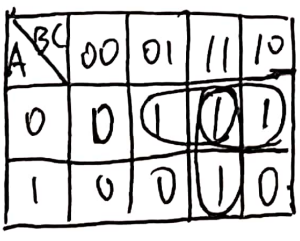


(2) $Y_2=AB'C+BC+A'BC'D$

$=A'BD+BC+AC$

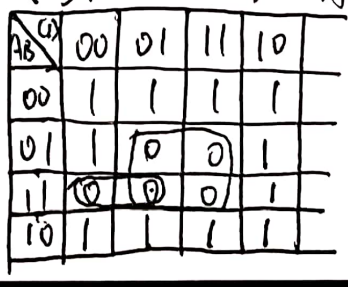


(3) $Y_3=\sum m(1,2,3,7)=A'C+A'B+BC$



(4) $Y_4=\sum m(0,1,2,3,4,6,8,9,10,11,14)$

$=(BD+ABC')'=A'D'+CD'+B'$



2-16 (3) $Y=A'B'+BC'+A'+B'+ABC=1$

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

(5) $Y=AB'C'+A'B'+A'D+C+BD = (BC'D')' = B'+C+D$

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

2-18 (a) $Y=((AB'C)'\cdot(BC')')' = AB'C+BC'$

(b) $Y=((A'+C)'+(A+B')'+(B+C')')' = A'B'C'+ABC$

(c) $Y_1=((AB')'(A\cdot D'\cdot C)')' = AB'+AD'C$

$Y_2=((AB')'\cdot(AC'D')'\cdot(A'C'D)'(ACD)')' = AB'+AC'D'+A'C'D+ACD$

(d) $Y_1=((AB+(A\oplus B)C)')' = AB+AB'C+A'BC = AB+AC+BC$

$Y_2=(A\oplus B)\oplus C = (A'B+AB')\oplus C = (A'B+AB')C'+(AB+AB')C$
$= A'BC'+AB'C'+ABC+A'B'C$

2-20 $Y_1=AB'C'+ABC+A'B'C+A'BC' = A'+B'C'+BC$
$(A'B'C'+A'BC=0)$

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

2-21

(1) $Y_1 = \sum m(0,1,2,4) + d(5,6)$

$= B' + C'$

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

(3) $Y_3 = \sum m(3,5,6,7,10) + d(0,1,2,4,8)$

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

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

2-24 Y_1

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

Y_2

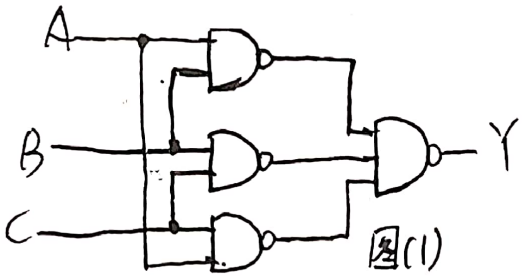
AB \ CD	00	01	11	10
00	1	1	1	1
01	0	0	1	1
11	0	0	0	1
10	0	0	0	1

最简化简 $Y_1 = AC' + AD' + B'C'$ $Y_2 = A'B' + CD' + A'C$

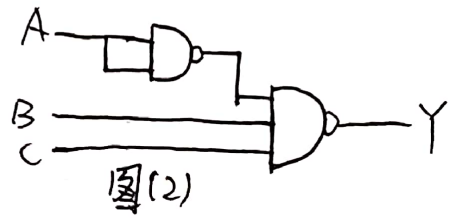
利用公用项化简 $Y_1 = A'B'C' + AC' + ACD'$ $Y_2 = A'B'C' + A'C + ACD'$

2-26 (1) $Y = ((AB)'(BC)'(AC)')'$ (2) $Y = (AB + A'B')C + B'C' = A + B'C'$

$= (A'BC)'$



图(1)



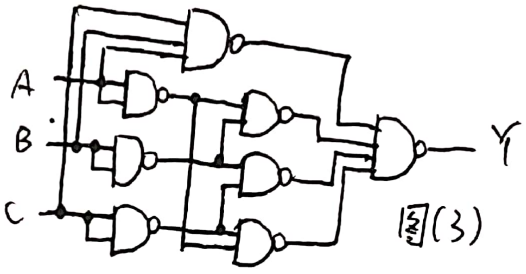
图(2)

(3) $Y = (A' + B' + C)(A' + BC')(A + B' + C')$

$= (A' + B'C' + BC)(A + B'C')$

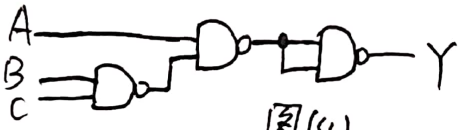
$= ABC + A'B' + A'C' + B'C'$

$= ((ABC)'(A'B')'(A'C')'(B'C')')'$



图(3)

(4) $Y = AB' + AC' = ((A(BC)')')'$



图(4)