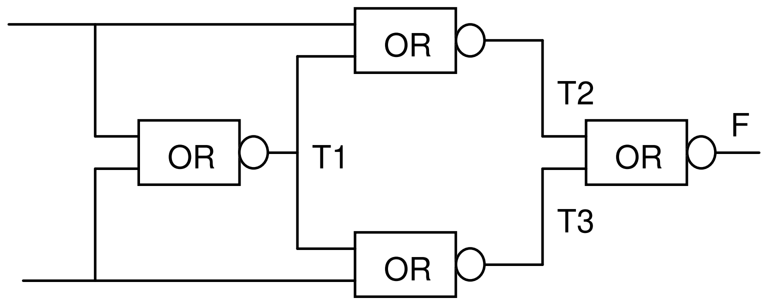
Solution III

3-1

$J = AD' + ABC + BCD$ $\quad\quad$ $K = A'D' + A'BC + BCD$

3-3



X	Y	$T1$	$T2$	$T3$	F
0	0	1	0	0	1
0	1	0	1	0	0
1	0	0	0	1	0
1	1	0	0	0	1

3-4

X	Y	Z	F	G
0	0	0	1	0
0	0	1	1	1
0	1	0	1	1
0	1	1	1	0
1	0	0	0	1
1	0	1	1	0
1	1	0	1	0
1	1	1	1	1

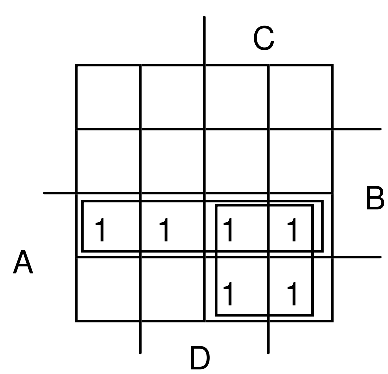
$F = (XY'Z')'$

$G = X \oplus Y \oplus Z$

3-6

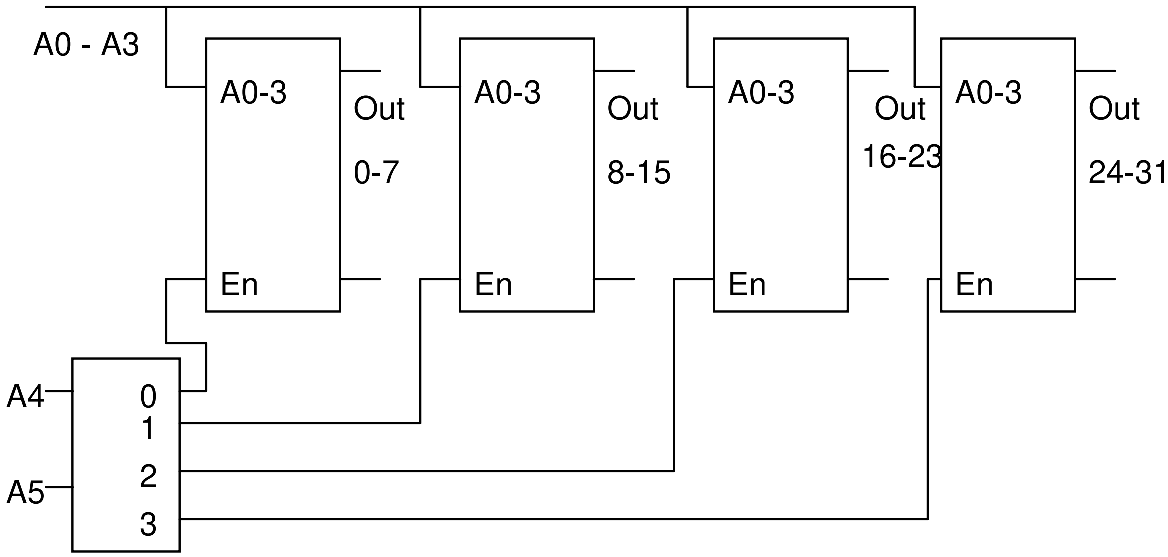
$$\begin{aligned}
M &= AS' + BS \\
F &= YX' + TX = YX' + X(ZY' + Z'Y) = X'Y + XY'Z + XYZ' \\
G &= T'X' + ZX = X'(ZY' + Z'Y)' + ZX = X'(Z' + Y)(Z + Y') + XZ = XZ + X'(YZ + Y'Z') \\
&= XZ + X'YZ + X'Y'Z'
\end{aligned}$$

3-11

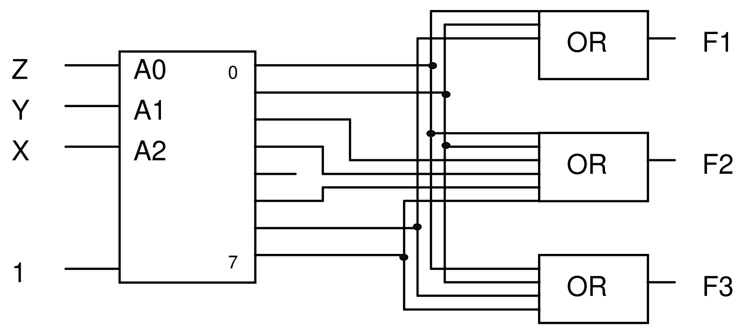


$F = AB + AC$

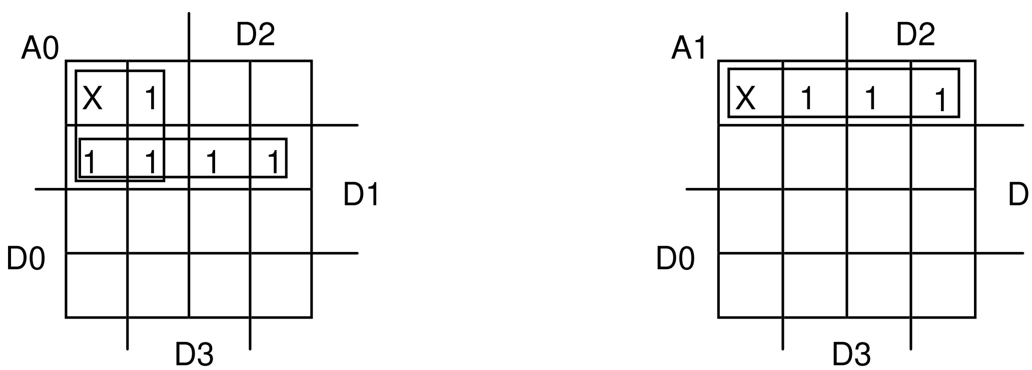
3-14



3-16



3-19



D3	*D2*	*D1*	*D0*	*A1*	*A2*	*V*
0	0	0	0	X	X	0
X	X	X	1	0	0	1
X	X	1	0	0	1	1
X	1	0	0	1	0	1
1	0	0	0	1	1	1

$V = D0 + D1 + D2 + D3$

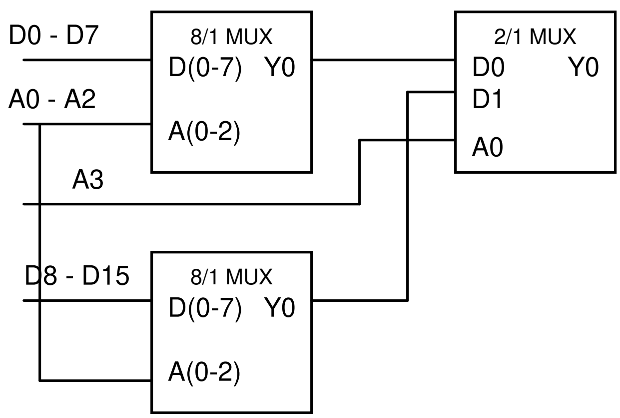
$A0 = D1 + D0'\, D2'$

$A1 = D0'\, D1'$

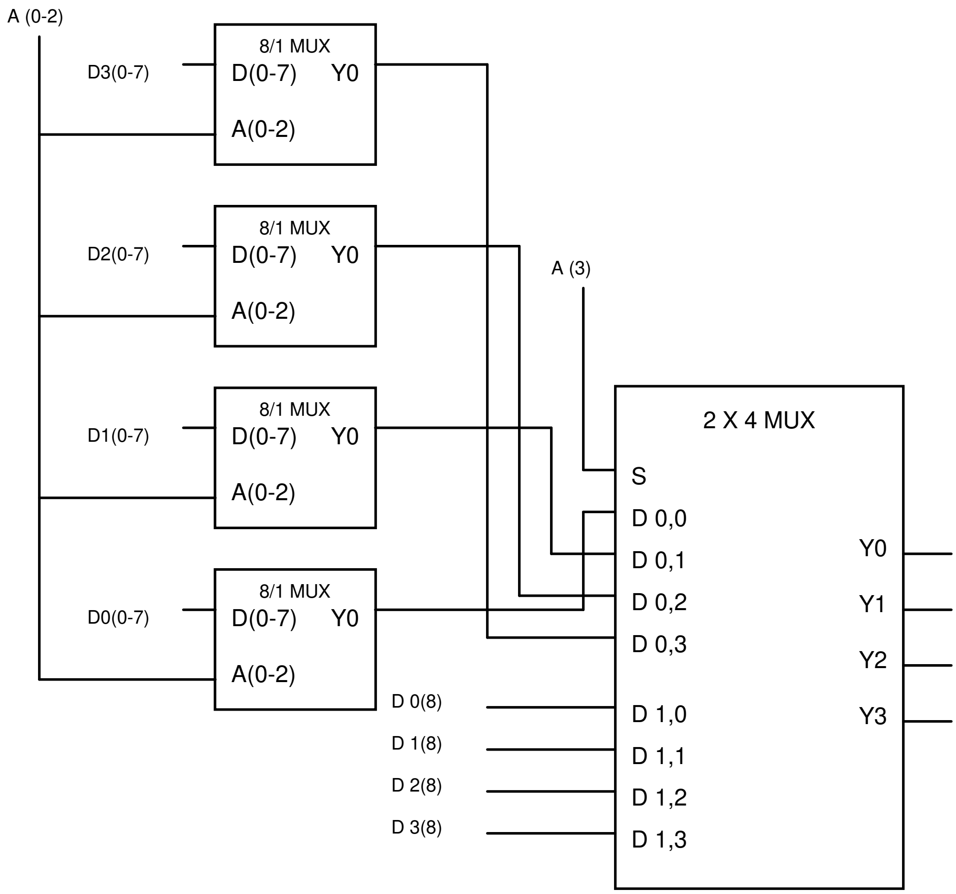
3-20

Octal								Binary			
7	6	5	4	3	2	1	0	A2	A1	A0	V
1	X	X	X	X	X	X	X	1	1	1	1
0	1	X	X	X	X	X	X	1	1	0	1
0	0	1	X	X	X	X	X	1	0	1	1
0	0	0	1	X	X	X	X	1	0	0	1
0	0	0	0	1	X	X	X	0	1	1	1
0	0	0	0	0	1	X	X	0	1	0	1
0	0	0	0	0	0	1	X	0	0	1	1
0	0	0	0	0	0	0	1	0	0	0	1
0	0	0	0	0	0	0	0	X	X	X	0

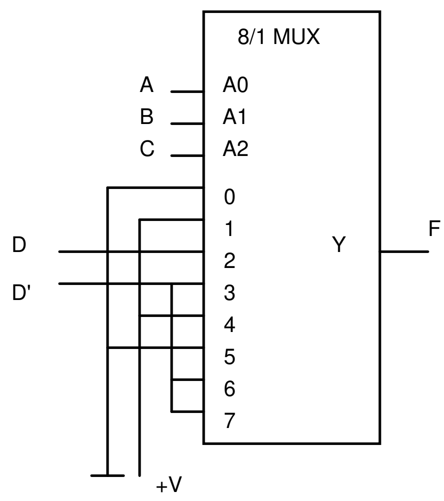
3-22



3-23


A (0-2)
8/1 MUX
D3(0-7)
D(0-7)
Y0
A(0-2)
8/1 MUX
D2(0-7)
D(0-7)
Y0
A(0-2)
8/1 MUX
D1(0-7)
D(0-7)
Y0
A(0-2)
8/1 MUX
D0(0-7)
D(0-7)
Y0
A(0-2)
A (3)
2 X 4 MUX
S
D 0,0
D 0,1
D 0,2
D 0,3
D 1,0
D 1,1
D 1,2
D 1,3
Y0
Y1
Y2
Y3
D 0(8)
D 1(8)
D 2(8)
D 3(8)

3-27


8/1 MUX
A
B
C
A0
A1
A2
0
1
2
3
4
5
6
7
D
D'
Y
F
+V

3-32

A	B	C	$S5$	$S4$	$S3$	$S2$	$S1$	$S0$
0	0	0	0	0	0	0	0	0
0	0	1	0	0	0	0	0	1
0	1	0	0	0	0	1	0	0
0	1	1	0	0	1	0	0	1
1	0	0	0	1	0	0	0	0
1	0	1	0	1	1	0	0	1
1	1	0	1	0	0	1	0	0
1	1	1	1	1	0	0	0	1

$S0 = C$
$S1 = 0$
$S2 = BC'$
$S3 = A'BC + AB'C$
$S4 = AB' + AC$
$S5 = AB$

3-34

a) 11011 + 10000 = 01011
b) 10110 + 10101 = 1011
c) 100 + 11000 = (–) 011100
d) 1011100 + 0100100 = 0000000

3-35

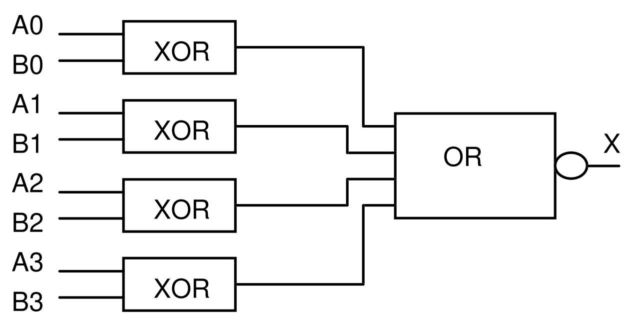
52 = 0110100 –17 = 1101111
52 – 17 = 0110100 + 1101111 = 0100011 = $(35)_{10}$

–52 = 1001100 17 = 0010001
–52 + 17 = 1001100 + 0010001 = 1011101 = $(–35)_{10}$

3-36

101111 + 111010 = 101001	–17 – 6 = –23
001010 + 100010 = 101100	10 – 30 = –20
110001 + 110110 = 100111	–15 – 10 = –25
101010 + 011001 = 000011	–22 + 25 = 3

3-41



3-42