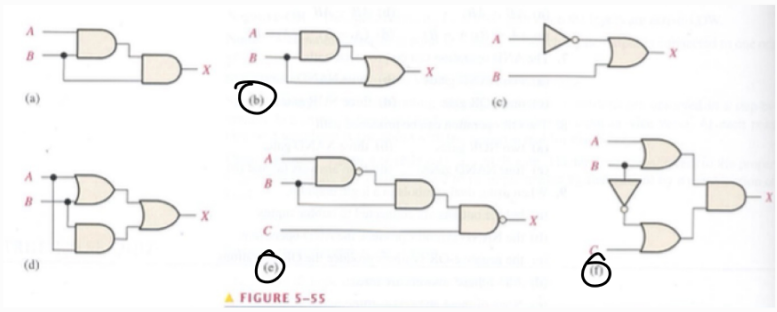
Section 5-1

5.



▲ FIGURE 5–55

b) $AB\bar{B}$

A	B	X
0	0	0
0	1	1
1	0	0
1	1	1

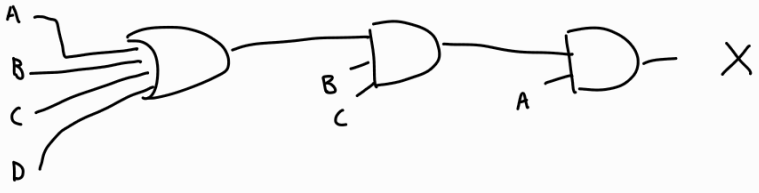
e) $X = \bar{A} + B$

A	B	X
0	0	1
0	1	1
1	0	0
1	1	1

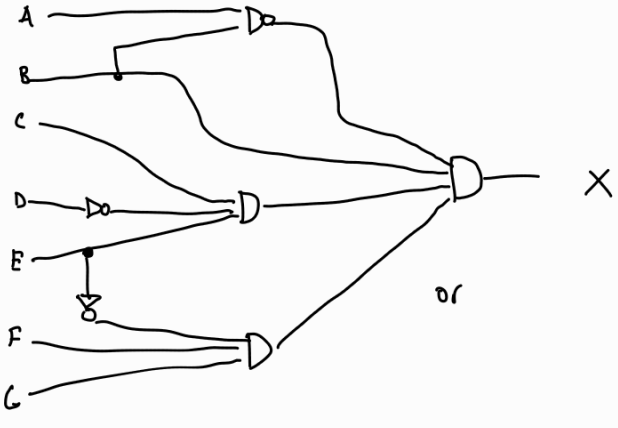
f)

A	B	C	K
0	0	0	0
0	0	1	0
0	1	0	0
0	1	1	1
1	0	0	1
1	0	1	1
1	1	0	0
1	1	1	1

11. e) $X = A[BC(A+B+C+D)]$



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

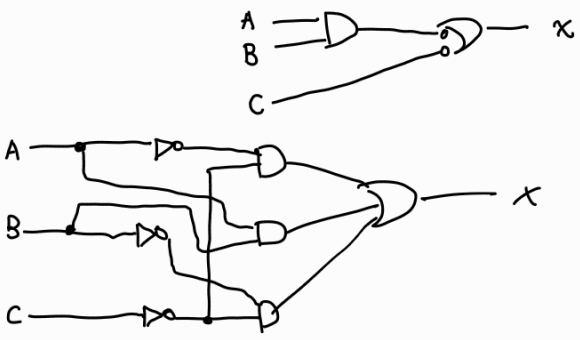


13. logic cor

INPUTS A	B	C		OUTPUT X
0	0	0	$\bar{A}\bar{B}\bar{C}$	1
0	0	1		0
0	1	0	$\bar{A}B\bar{C}$	1
0	1	1		0
1	0	0	$A\bar{B}\bar{C}$	1
1	0	1		0
1	1	0	$AB\bar{C}$	1
1	1	1	ABC	1

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

$= AB + \bar{C}$



15. $X = AB + ABC = AB(1 + C) = AB$

A	B	C	X
0	0	0	0
0	0	1	0
0	1	0	0
0	1	1	0
1	0	0	0
1	0	1	0
1	1	0	1
1	1	1	1

A	B	X
0	0	0
0	1	0
1	0	0
1	1	1

$\therefore X = 1 \quad AB = 1$

17.

a) $X = AB + \bar{B}C$

No simplification

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

No simplification

c) $X = AB + A\bar{B} = A$

Direct connection from input to output no gates.

d) $X = \overline{ABC} + B(EF + \bar{G}) = \bar{A} + \bar{B} + \bar{C} + BEF + B\bar{G}$

$= \bar{A} + \bar{C} + BEF + \bar{B} + \bar{G}$

$= \bar{A} + \bar{C} + \bar{B} + EF + G$

e) $X = A[BC(A + B + C + D)]$

$= ABCA + ABCB + ABCC + ABCD$

$= ABC + ABC + ABC + ABCD$

$= ABC$

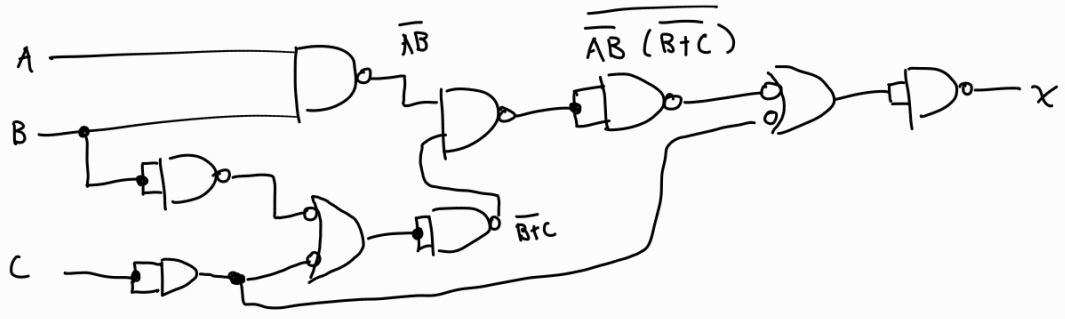
5) $X = B((\bar{D}E + \bar{E}FG)(\overline{\bar{A}B} + C)$

$= (BC\bar{D}E + B\bar{E}FG)(\bar{A} + \bar{B} + C)$

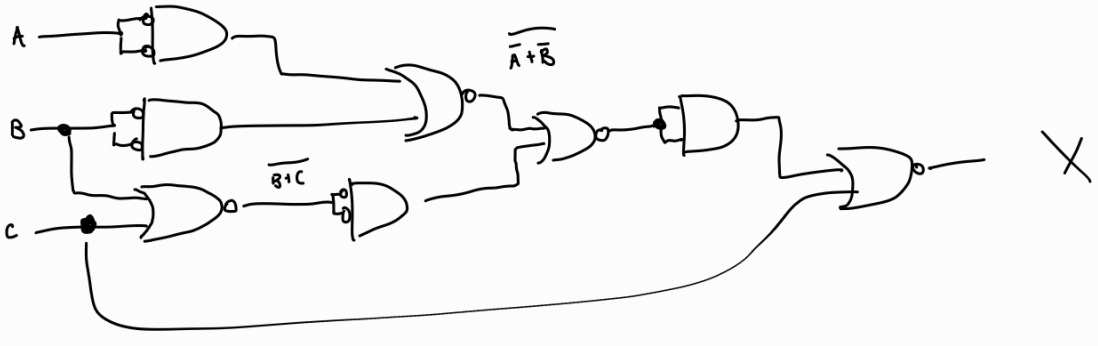
$= \bar{A}BC\bar{D}E + \bar{A}B\bar{E}FG + BC\bar{D}E + BC\bar{E}FG$

$= BC\bar{D}F + \bar{A}B\bar{E}FG + BC\bar{E}FG$

21. $x = \overline{\overline{\overline{AB}\,(\overline{B+C})} + C}$

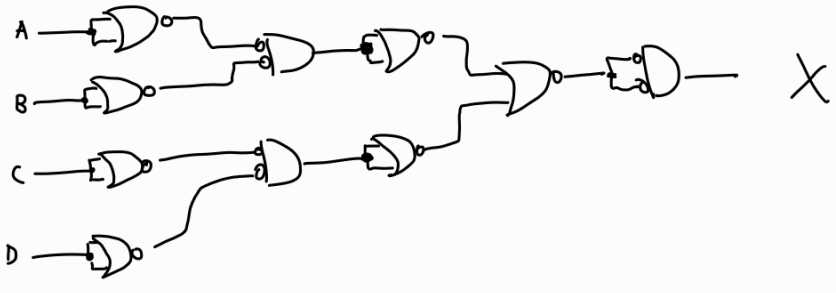


23. $X = \overline{\overline{\overline{AB}\,(\overline{B+C})}\,C}$

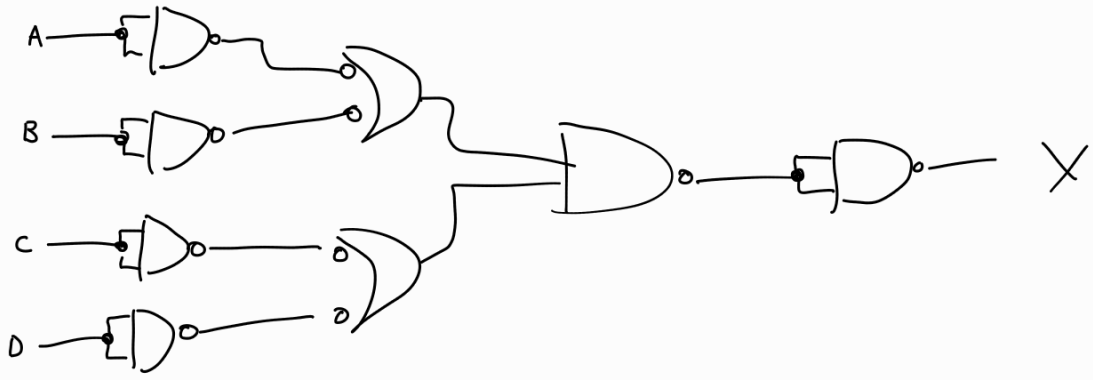


24. e)

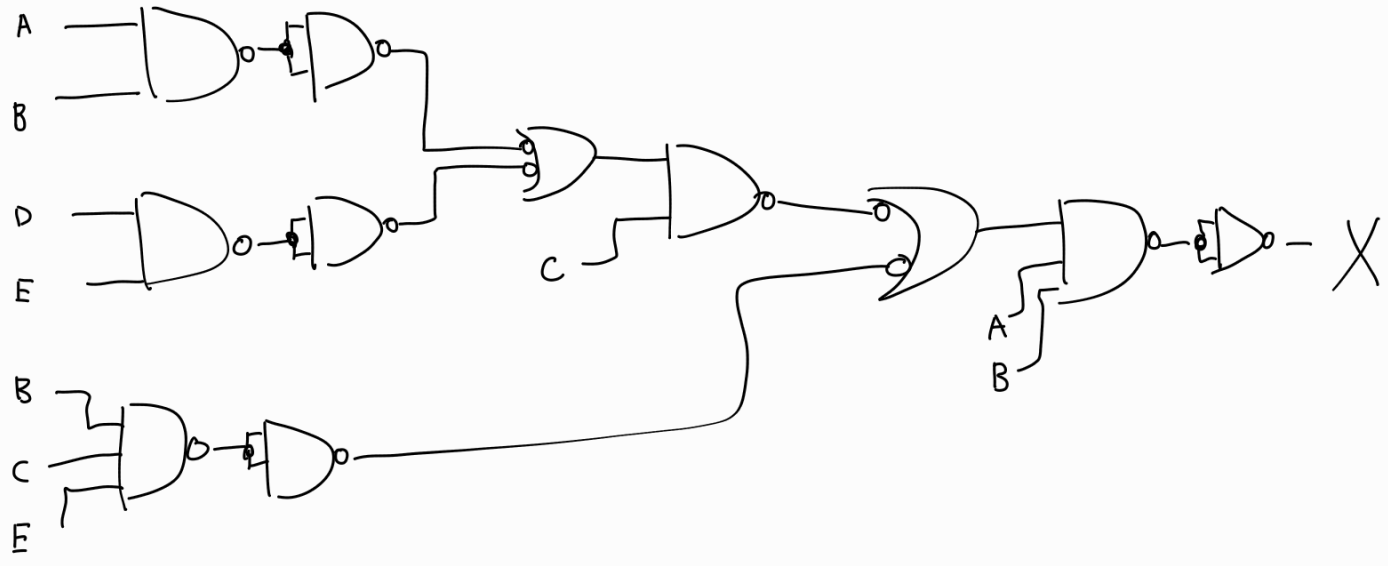
$X = \overline{AB} + \overline{CD}$



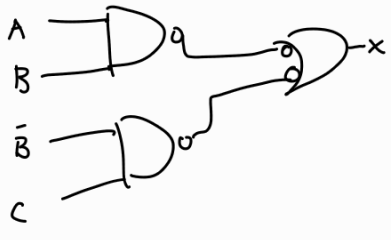
25. f) $X = (A+B)(C+D)$



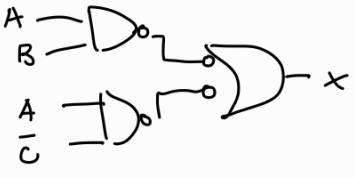
g)



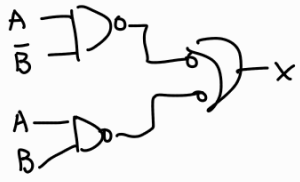
27. a) $x = AB + \bar{B}C$



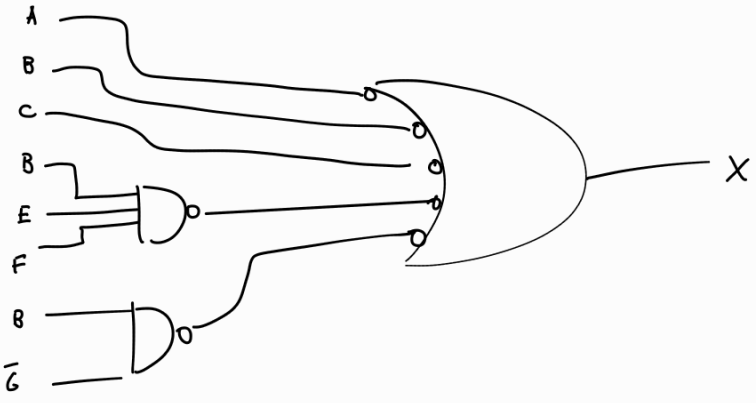
b) $x = A(B+\bar{C}) = AB + A\bar{C}$



c) $X = A\bar{B} + AB$

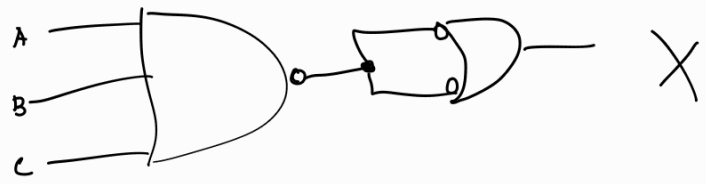


d) $x = \overline{ABC} + B(EF+\bar{G}) = \bar{A}+\bar{B}+\bar{C} + BEF+B\bar{G}$



25. e) $x = A[BC(A+B+C+D)] = ABCA + ABCB + ABCC + ABCD$

$= ABC$

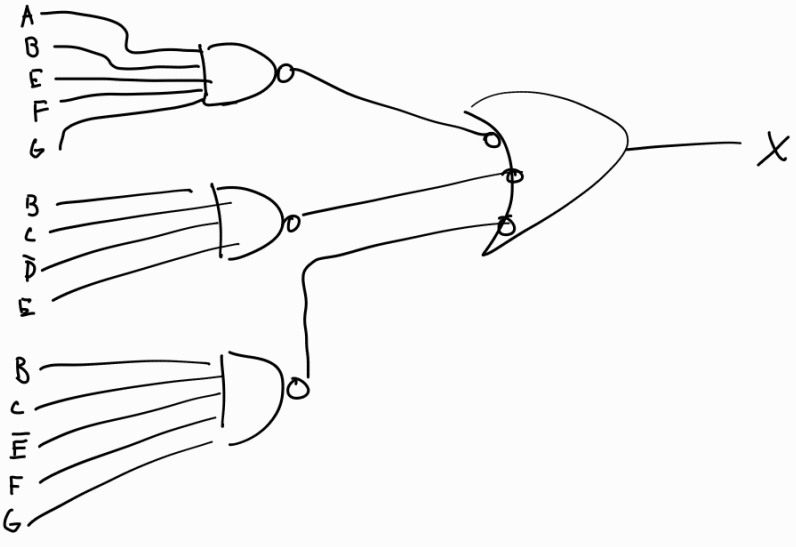


f) $x = B(C\bar{D}E + \bar{E}FG)(\bar{A}\bar{B} + C) = B(C\bar{D}E + \bar{E}FG)(\bar{A} + \bar{B} + C)$

$= B(\bar{A}C\bar{D}E + \bar{A}\bar{E}FG + \bar{B}C\bar{D}E + \bar{B}\bar{E}FG + C\bar{D}E + C\bar{E}FG$

$= \bar{A}B\bar{E}FG + B\bar{B}\bar{E}FG + BC\bar{D}E + BC\bar{E}FG$

$= \bar{A}B\bar{E}FG + BC\bar{D}E + BC\bar{E}FG$



29. $x = (\overline{\bar{A}B})B$

$= A + \bar{B} + \bar{B}$

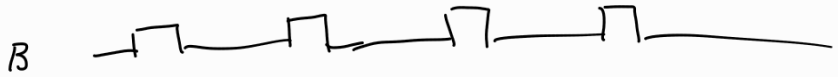
$= A + \bar{B}$

31. $x = 1$ when $A = 1$

$B = 0$ when $C = 0$

don't know if

$x = 1$ when $A, B = 1$



$X = A\overline{BC}$