

### Homework 3

Ex ① a)

A	B	C	BC	A + BC
0	0	0	0	0
0	0	1	0	0
0	1	0	0	0
0	1	1	1	1
1	0	0	0	1
1	0	1	0	1
1	1	0	0	1
1	1	1	1	1

b)

A	B	C	AB	BC	AB + BC
0	0	0	0	0	0
0	0	1	0	0	0
0	1	0	0	0	0
0	1	1	0	1	1
1	0	0	0	0	0
1	0	1	0	0	0
1	1	0	1	0	1
1	1	1	1	1	1

c)

A	B	C	D	$\overline{AB}$	$\overline{A}$	$\overline{ABC}$	$\overline{D}$	$\overline{CD}$	$AB + \overline{A}BC + C\overline{D}$
0	0	0	0	1	1	1	1	1	0
0	0	0	1	1	1	1	0	0	0
0	0	1	0	1	1	0	1	1	1
0	0	1	1	1	1	0	0	0	0
0	1	0	0	1	0	1	0	1	0
0	1	0	1	0	1	0	0	0	0
0	1	1	0	1	1	1	1	1	1
0	1	1	1	0	1	1	0	0	1
1	0	0	0	0	0	0	1	0	0
1	0	0	1	0	0	0	0	0	0
1	0	1	0	0	0	1	1	1	1
1	0	1	1	0	0	0	0	0	0
1	1	0	0	1	0	0	1	0	1
1	1	0	1	1	0	0	0	0	1
1	1	1	0	1	0	0	1	1	1
1	1	1	1	1	0	0	0	0	1

d)

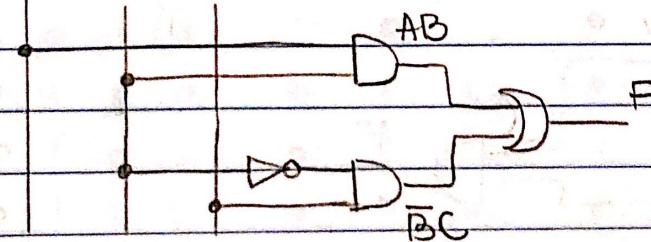
A	B	C	$\overline{A}$	$\overline{A}+B$	$\overline{A}+C$	$(\overline{A}+B)(\overline{A}+C)$
0	0	0	1	1	1	1
0	0	1	1	1	1	1
0	1	0	1	1	1	1
0	1	1	1	1	1	1
1	0	0	0	0	0	0
1	0	1	0	1	1	0
1	1	0	0	1	0	0
1	1	1	0	1	1	1

e)

A	B	C	$\bar{A}$	$\bar{B}$	$\bar{C}$	$\bar{AB}$	$\bar{AC}$	$\bar{BC}$	$\bar{ABC}$	F
0	0	0	1	1	1	1	1	1	1	1
0	0	1	1	1	0	1	0	0	0	1
0	1	0	1	0	1	0	0	0	0	1
0	1	1	1	0	0	0	0	1	0	1
1	0	0	0	1	1	0	0	0	1	0
1	0	1	0	1	0	0	0	0	0	0
1	1	0	0	0	1	0	1	0	0	1
1	1	1	0	0	0	1	1	0	0	1

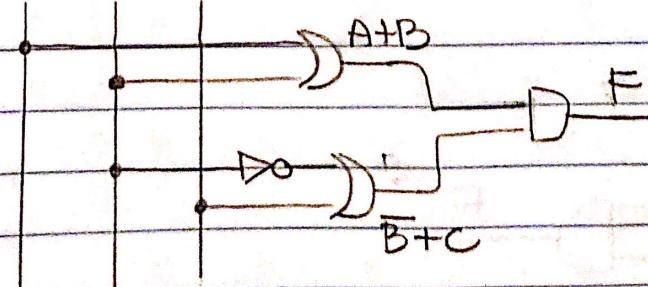
Ex(2) a) Circuits are also on Homework 3.Circ

A B C



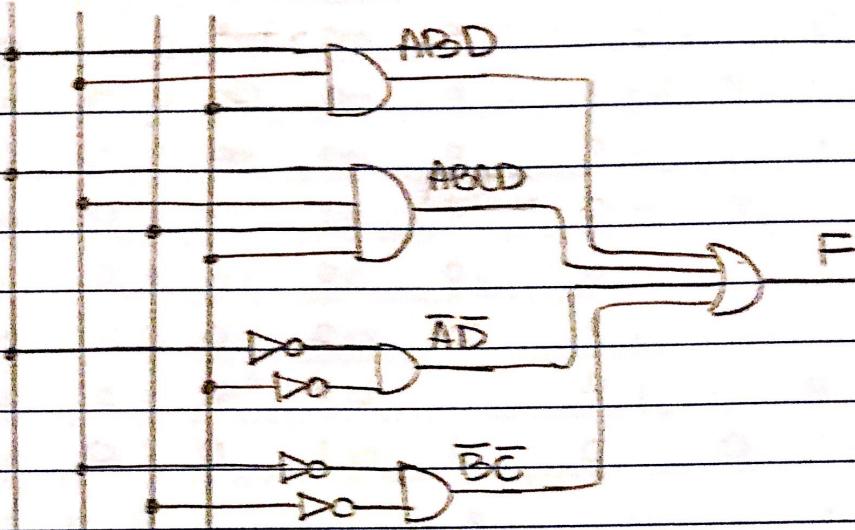
b)

A B C



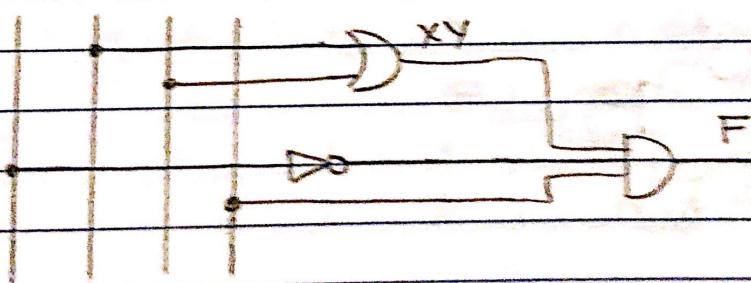
c)

A B C D



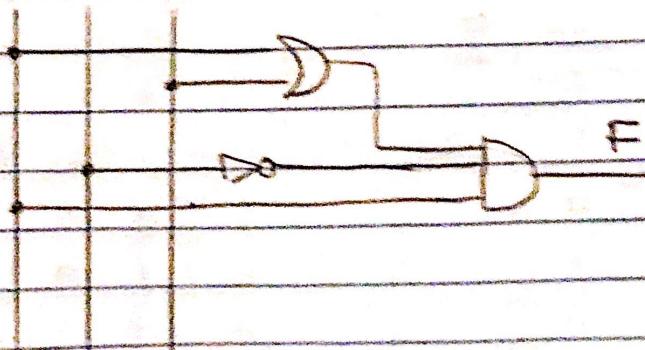
d)

W X Y Z



e)

A B C



Ex(3)  $F = \bar{A}B + A\bar{B}$

A	B	$\bar{A}$	$\bar{B}$	$\bar{A}\bar{B}$	$A\bar{B}$	$\bar{A}B + A\bar{B}$
0	0	1	1	0	0	0
0	1	1	0	1	0	1
1	0	0	1	0	1	1
1	1	0	0	0	0	0

Ex(4)  $F = (A+B+\bar{C})(A+D)(A+\bar{B}+\bar{C})$

A	B	C	D	$\bar{B}$	$\bar{C}$	$\overbrace{A+\bar{B}+\bar{C}}$	$\overbrace{A+D}$	F
0	0	0	0	1	1	0	0	0
0	0	0	1	1	1	0	0	0
0	0	1	0	1	0	0	0	0
0	0	1	1	1	0	0	0	0
0	1	0	0	0	1	0	0	0
0	1	0	1	0	1	0	0	0
0	1	1	0	0	0	0	0	0
0	1	1	1	0	0	0	0	0
1	0	0	0	1	1	1	0	1
1	0	0	1	1	1	1	1	1
1	0	1	0	1	0	0	0	0
1	0	1	1	1	0	0	1	1
1	1	0	0	0	1	0	0	0
1	1	0	1	0	1	0	1	1
1	1	1	0	0	0	0	0	0
1	1	1	1	0	0	0	1	1

Ex(5)

$$F = B + (C(A+B) + AC)$$

A	B	C	$A+B$	$C(A+B)$	$A+C$	$C(A+B)+AC$	$B+(C(A+B)+AC)$
0	0	0	0	0	0	0	0
0	0	1	0	0	1	1	1
0	1	0	1	0	0	0	1
0	1	1	1	1	1	1	1
1	0	0	1	0	1	1	1
1	0	1	1	1	1	1	1
1	1	0	1	0	1	1	1
1	1	1	1	1	1	1	1

Ex(6)

$$F = (D(\overline{AB+C}))(D(\overline{AB+C}))$$

A	B	C	D	$AB$	$\overline{AB+C}$	$\overline{AB+C}$	$D(\overline{AB+C})$	$D(\overline{AB+C})$
0	0	0	0	0	1	1	0	0
0	0	0	1	0	0	1	1	0
0	0	1	0	0	1	0	0	0
0	0	1	1	0	0	0	0	0
0	1	0	0	0	1	0	0	0
0	1	0	1	0	1	1	1	0
0	1	1	0	0	1	0	0	0
0	1	1	1	0	0	0	1	0
1	0	0	0	0	1	0	0	0
1	0	0	1	0	1	1	0	0
1	0	1	0	0	1	1	0	0
1	0	1	1	0	0	0	0	0
1	1	0	0	1	0	0	0	0
1	1	0	1	1	0	0	0	0
1	1	1	0	1	1	0	0	0
1	1	1	1	1	0	0	0	0