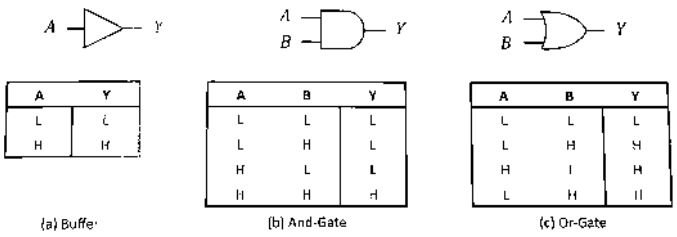
1a) Write a combination truth and function table for the devices in Figure 5-1 assuming inputs and outputs are active low.



A	Y
L	L
H	H

(a) Buffer

A	B	Y
L	L	L
L	H	L
H	L	L
H	H	H

(b) And-Gate

A	B	Y
L	L	L
L	H	H
H	I	H
L	H	H

(c) Or-Gate

Figure 5-1 Symbols and Function Tables for the Three Basic Logic Devices.

OR

A	B	A.L	B.L	(A+B).L	A+B
L	L	H	H	H	L
L	H	H	L	L	H
H	L	L	H	L	H
H	H	L	L	L	H

Buffer

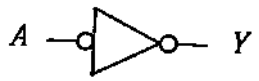
A	A.L	Y.L	Y
L	H	H	L
H	L	L	H

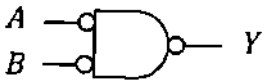
And

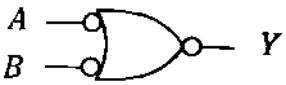
A	B	A.L	B.L	AB.L	AB
L	L	H	H	H	L
L	H	H	L	H	L
H	L	L	H	H	L
H	H	L	L	L	H

2a) Consider the devices below and write a function table for each of them.

CHAPTER 5







A	$\bar{A}$
L	L
H	H

A	B	$\bar{A}$	$\bar{B}$	$\bar{A}\bar{B}$	$\overline{\bar{A}\bar{B}}$
L	L	H	H	H	L
L	H	H	L	L	H
H	L	L	H	L	H
H	H	L	L	L	H

A	B	$\bar{A}$	$\bar{B}$	$\bar{A}+\bar{B}$	$\overline{\bar{A}+\bar{B}}$
L	L	H	H	H	L
L	H	H	L	H	L
H	L	L	H	H	L
H	H	L	L	L	H

b) For each device, tell whether the function table defines a new device or one that has already been presented in this chapter.

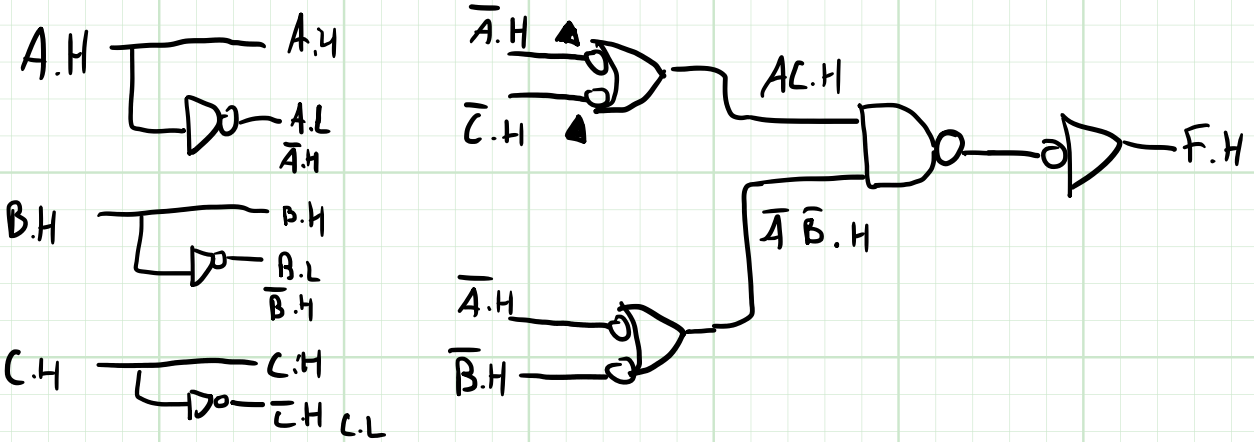
Buffer OR Gate AND Gate

3) Complete table 5-1

Table 5-1 Combination Truth and Function Table for Figure 5-7.

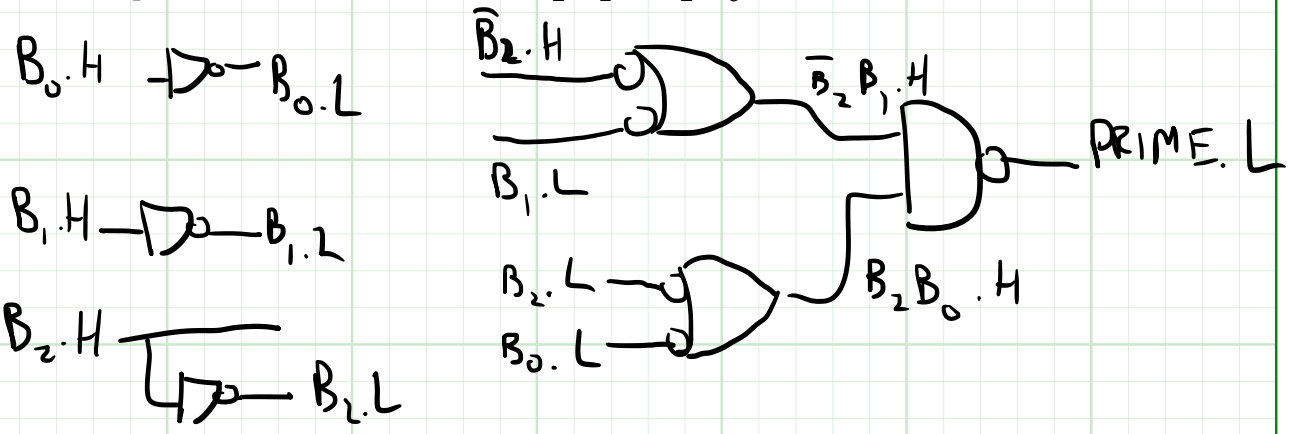
A	B	C	A.L	B.H	C.H	A.H	B.L	$\overline{AB}$.H	AB$\overline{C}$.H	F.L	F
0	0	0	H	L	L	L	H	L	L	H	0
0	0	1	H	L	H	L	H	L	L	H	0
0	1	0	H	H	L	L	L	H	L	L	1
0	1	1	H	H	H	L	L	H	L	L	1
1	0	0	L	L	L	H	H	L	L	H	1
1	0	1	L	L	H	H	H	L	L	H	1
1	1	0	L	H	L	H	L	L	H	L	0
1	1	1	L	H	H	H	L	L	L	H	1

4) Design a logic circuit for $F = AC + \overline{A}\,\overline{B}$ assuming A, B, C and F are active high. Use only NAND and NOR and/or inverters.



8) Design a logic circuit for the logic equation in Eq 3.25 using only nand- or nor-gates. Assume all inputs are active high and the output, PRIME, is active low.

Eq. 4.25 $PRIME = \overline{B_2}\, B_1 + B_2\, B_0$



10) Show how to implement a 3-input NAND gate using MOSFETs.