Department of Computer Engineering

BLG 242E
Digital Circuits Laboratory
Experiment Report

Experiment : 1 Boolean Algebra

Experiment Date : 01.03.2016

Group Number : 12

Group Members :

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1 INTRODUCTION

We made 5 different function on experiment. First we tried to understand the device and other equipment's like gates and gate numbers. Then we attached necessary gates on the device and connected gates to the power with cables. Finally, we connect gates to inputs with correct order. After that our circuit run correctly.

2 REQUIREMENTS

2.1 TRUTH TABLES

Part 1.a) F1 (a,b) = a + a.b

A	B	A.B	A + A.B
0	0	0	0
0	1	0	0
1	0	0	1
1	1	1	1

Part 2.b) F2 (a,b) = (a+b) . (a+b')

A	B	A+B	A+B'	(A+B).(A+B')
0	0	0	1	0
0	1	1	0	0
1	0	1	1	1
1	1	1	1	1

Part 2) Dual of F(a,b) = a+a.b → a.(a+b)

A	B	A+B	A.(A+B)	A+A.B
0	0	0	0	0
0	1	1	0	0
1	0	1	1	1
1	1	1	1	1

Part 3) F3(x,y,z) = x+y.z complement → x'.(y'+z')

X	Y	Z	Y'+Z'	X'.(Y'+Z')
0	0	0	1	1
0	0	1	1	1
0	1	0	1	1
0	1	1	0	1
1	0	0	1	0
1	0	1	1	0
1	1	0	1	0
1	1	1	0	0

Part 4) F4(a,b,c,d) = b.d + b'.d'

B	D	B.D	B'.D'	B.D + B'.D'
0	0	0	1	1
0	1	0	0	0
1	0	0	0	0
1	1	1	0	1

F = A'B'C'D'+A'B'CD'+A'BC'D+A'BCD+AB'C'D'+AB'CD'+ABC'D+ABCD

F = A'B'D'(C+C') + A'BD(C+C') + AB'D'(C+C') + ABD(C+C')

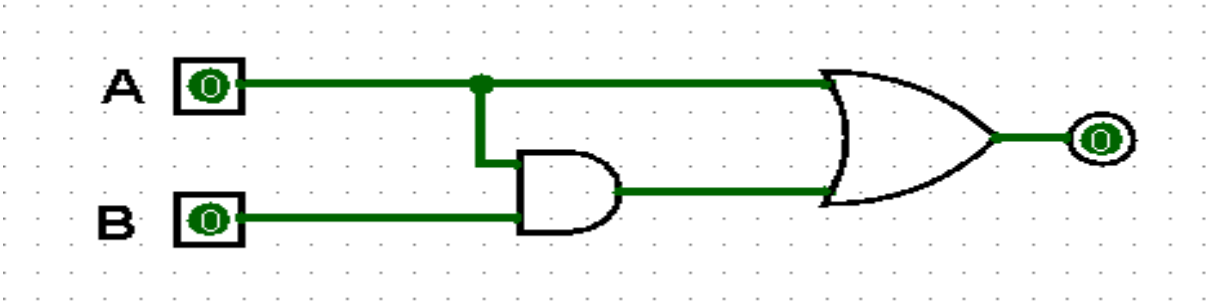
F = A'B'D' + A'BD + AB'D' + ABD

F = BD(A+A') + B'D'(A+A')

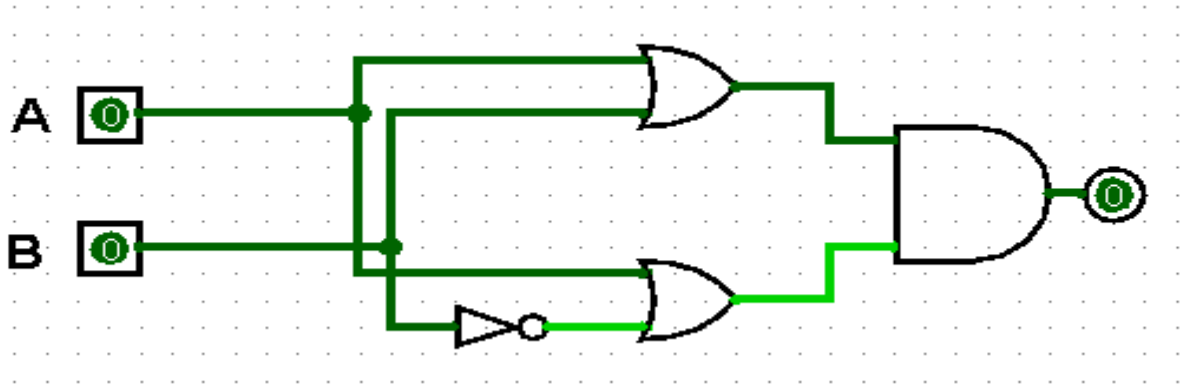
F = BD + B'D'

2.2 CIRCUITS

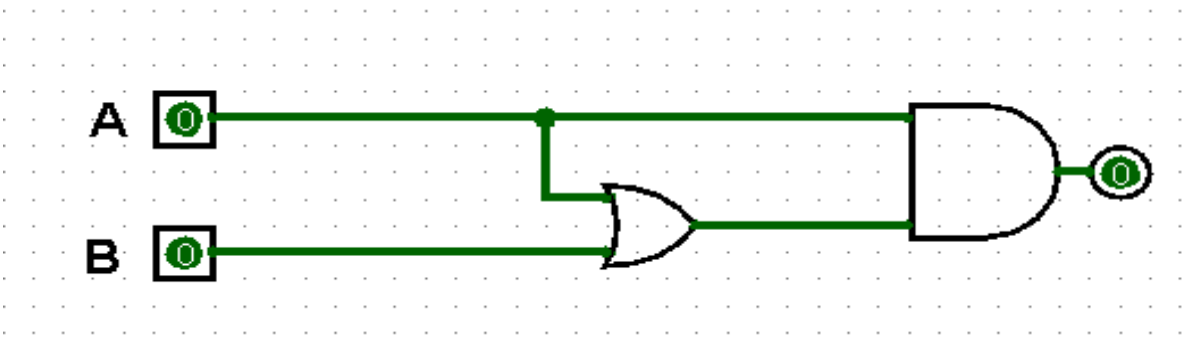
Part 1.a)



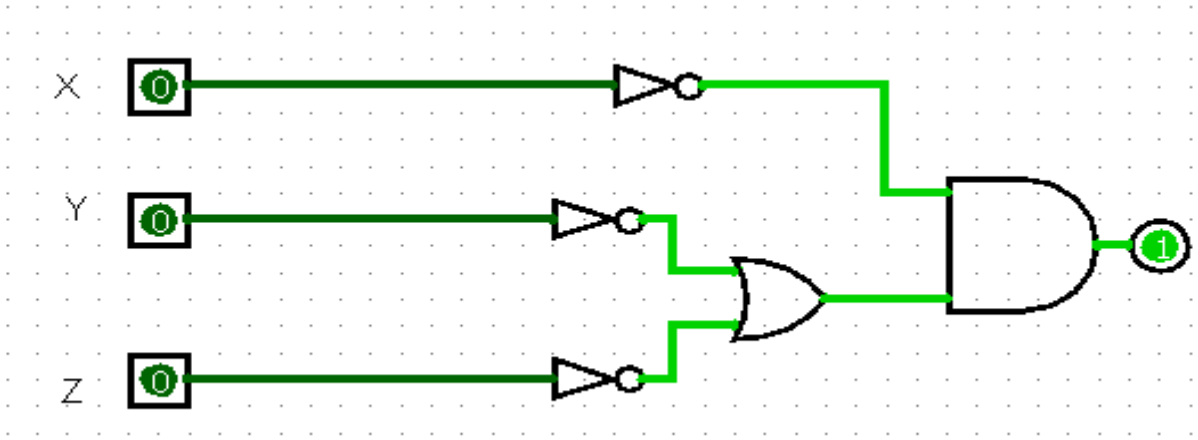
Part 1.b)



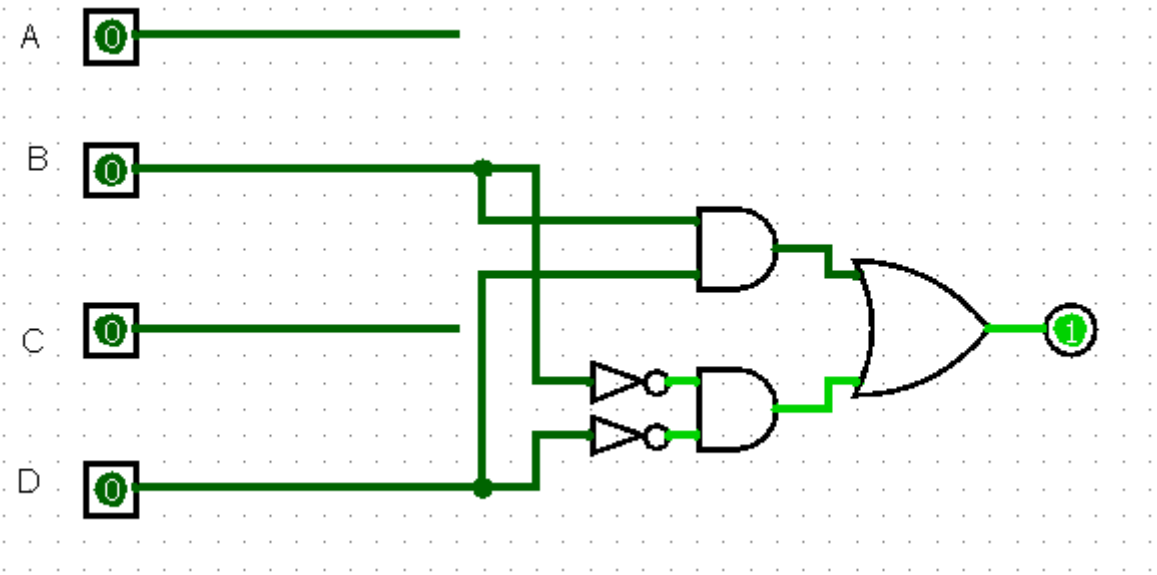
Part 2)



Part 3)



Part 4)



3 CONCLUSION

We learnt how to use this device and how to connect power, gates, inputs etc.