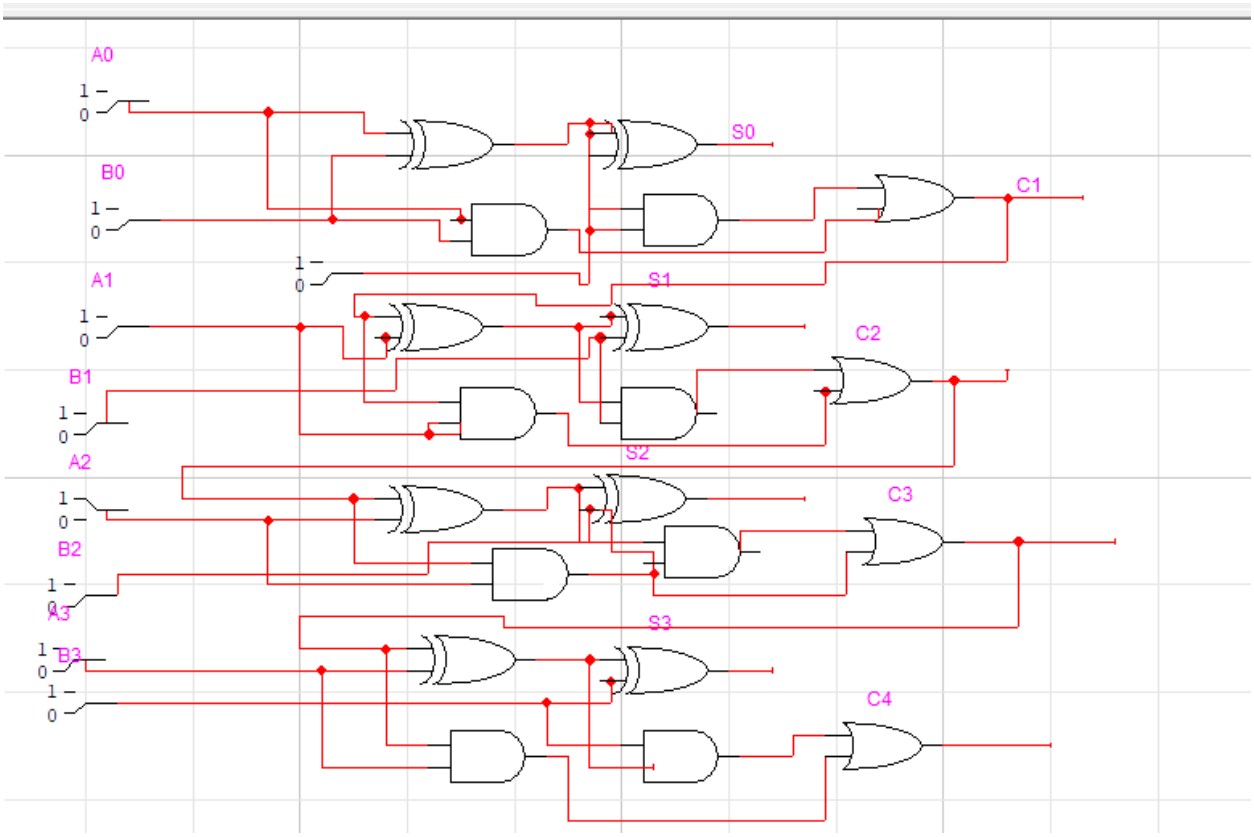
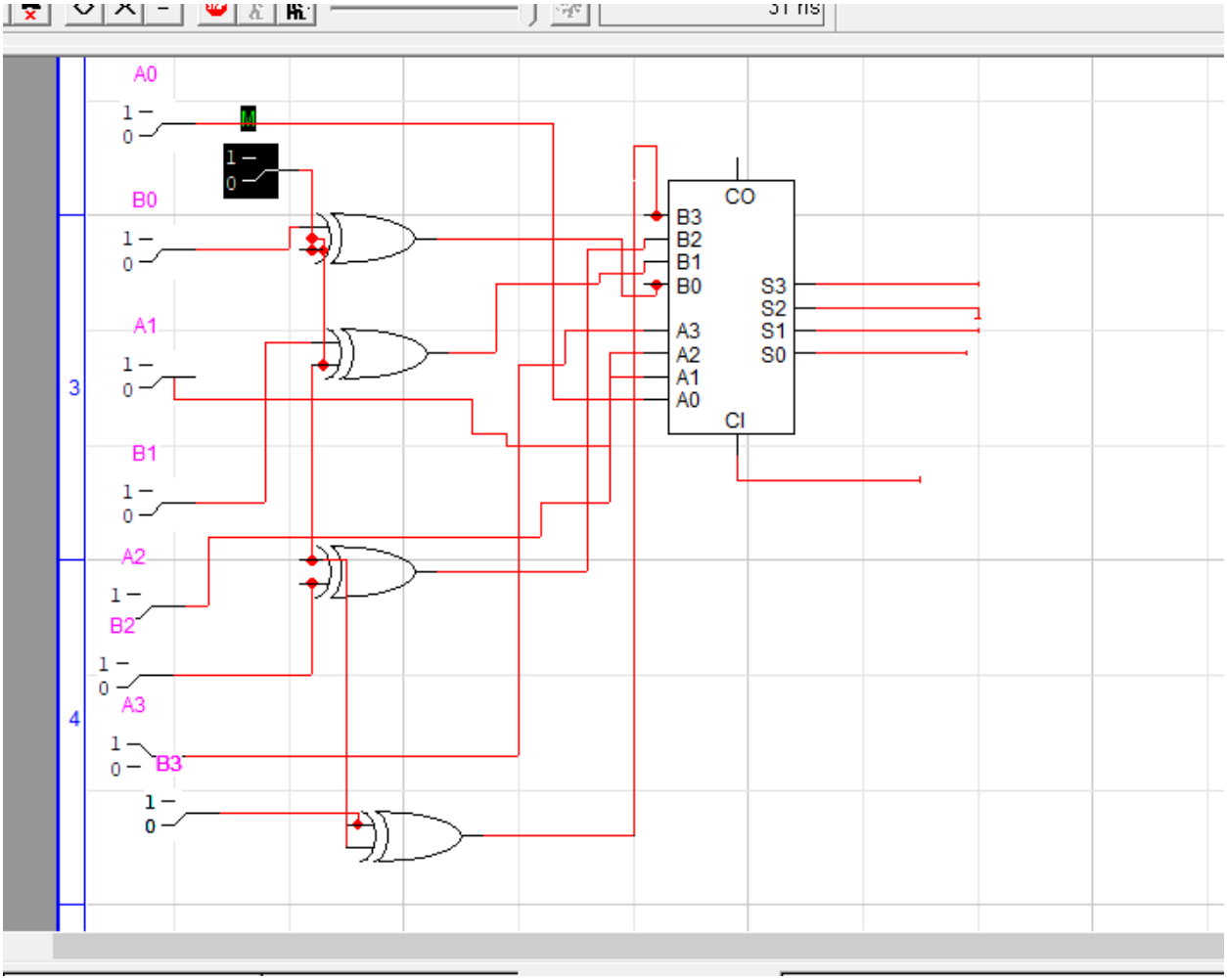
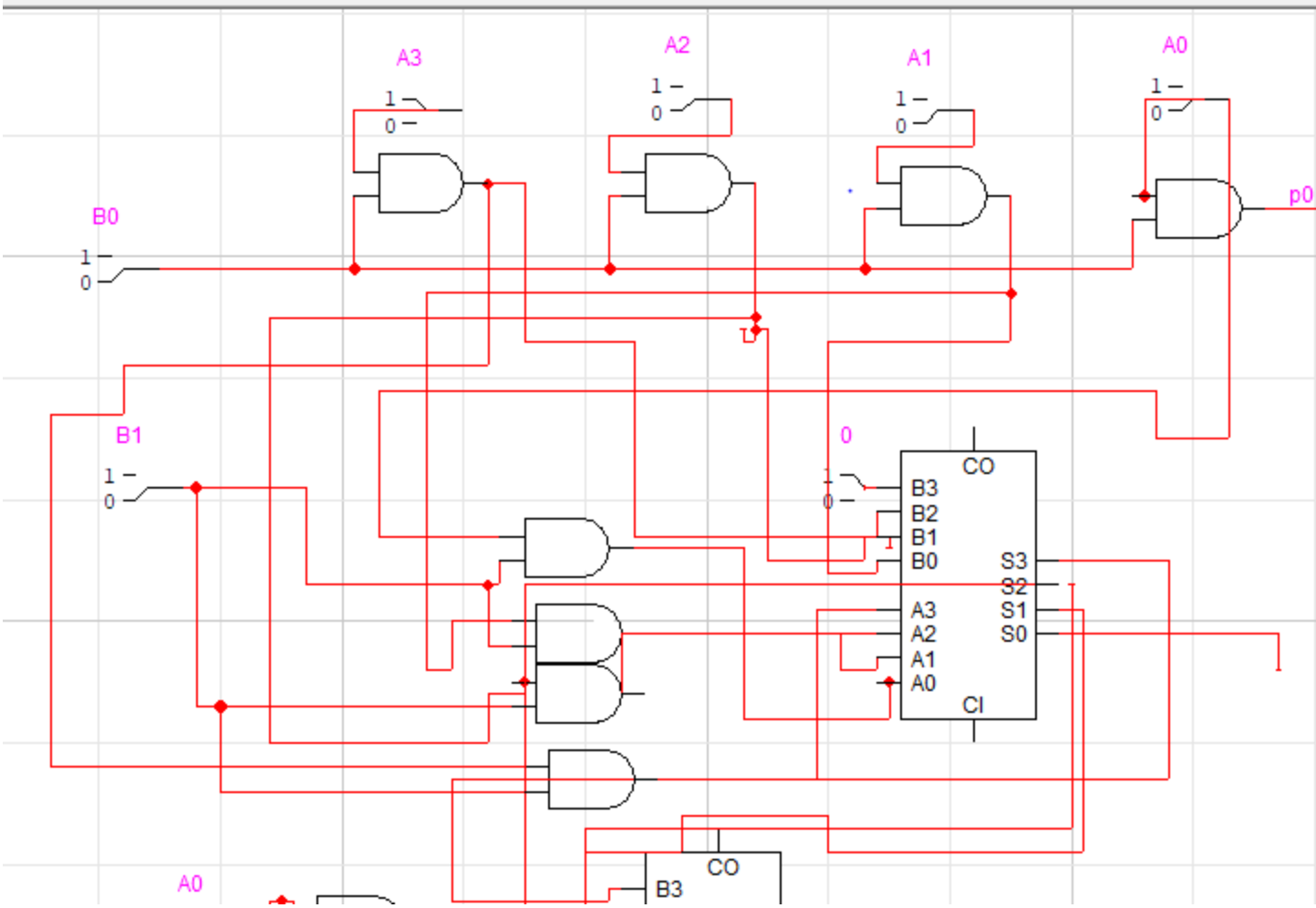
Task 2

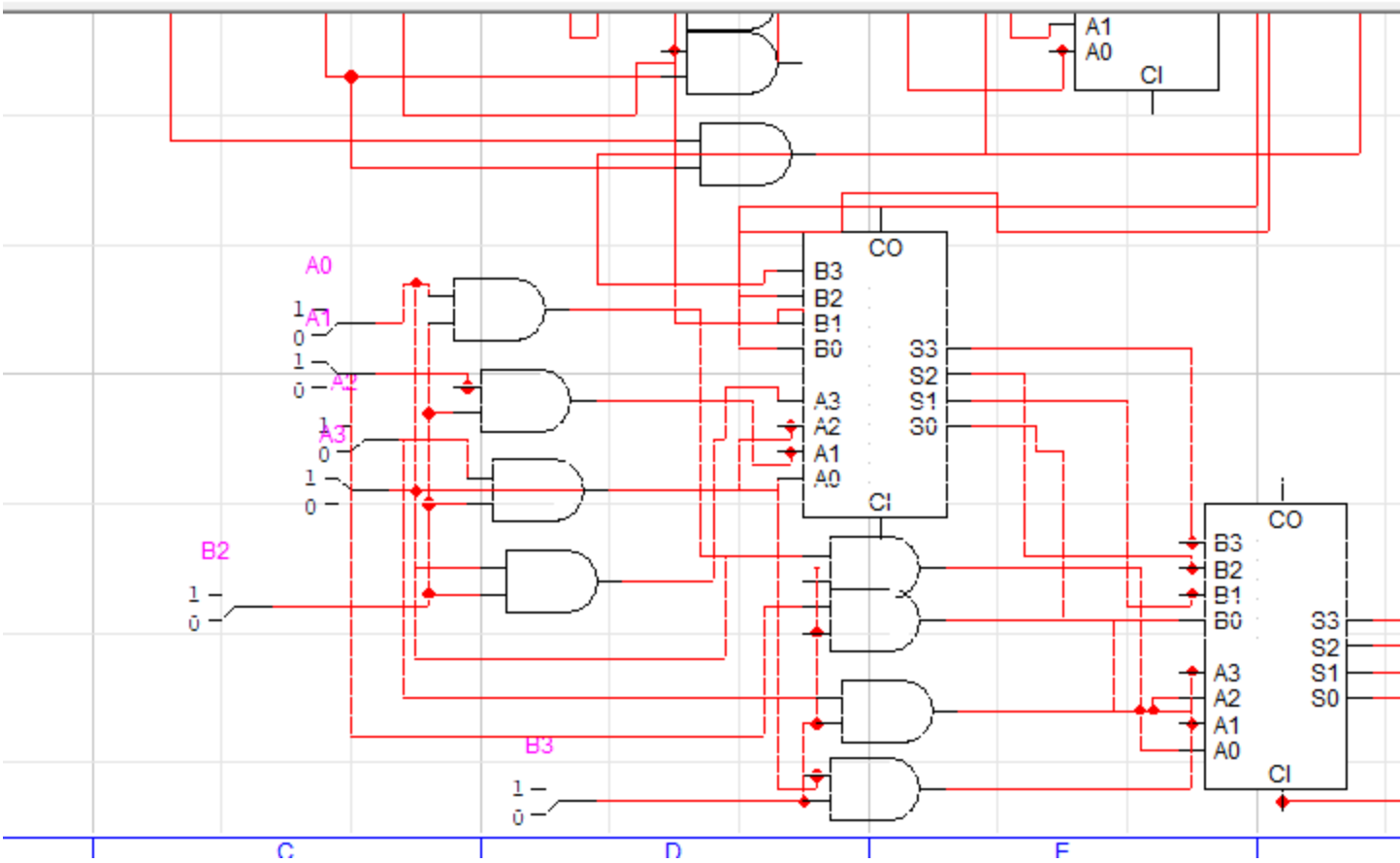


Subtractor



Task 3


A3
A2
A1
A0
B0
B1
p0
0
CO
B3
B2
B1
B0
S3
S2
A3
A2
A1
A0
S1
S0
CI
CO
B3
A0


A1
A0
CI
CO
B3
B2
B1
B0
S3
S2
S1
S0
A3
A2
A1
A0
CI
A0
A1
A2
A3
B2
B3
C
D
E

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LAB MANUAL 09 (20-09-21)

Question 1 LAB TASK 1

a) Write truth table

Compare two 2-bit numbers

Index	A_1	A_0	B_1	B_0	L	E	G
0	0	0	0	0	0	1	0
1	0	0	0	1	1	0	0
2	0	0	1	0	1	0	0
3	0	0	1	1	1	0	0
4	0	1	0	0	0	0	1
5	0	1	0	1	0	1	0
6	0	1	1	0	1	0	0
7	0	1	1	1	1	0	0
8	1	0	0	0	0	0	1
9	1	0	0	1	0	0	1
10	1	0	1	0	0	1	0
11	1	0	1	1	1	0	0
12	1	1	0	0	0	0	1
13	1	1	0	1	0	0	1
14	1	1	1	0	0	0	1
15	1	1	1	1	0	1	0

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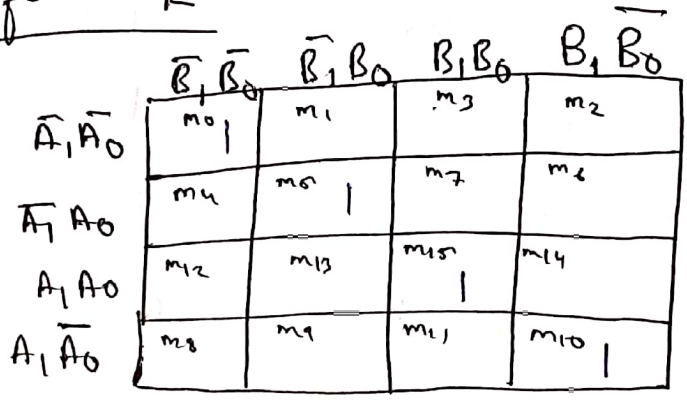
b) minimal SOP expressions (K-map)

for L

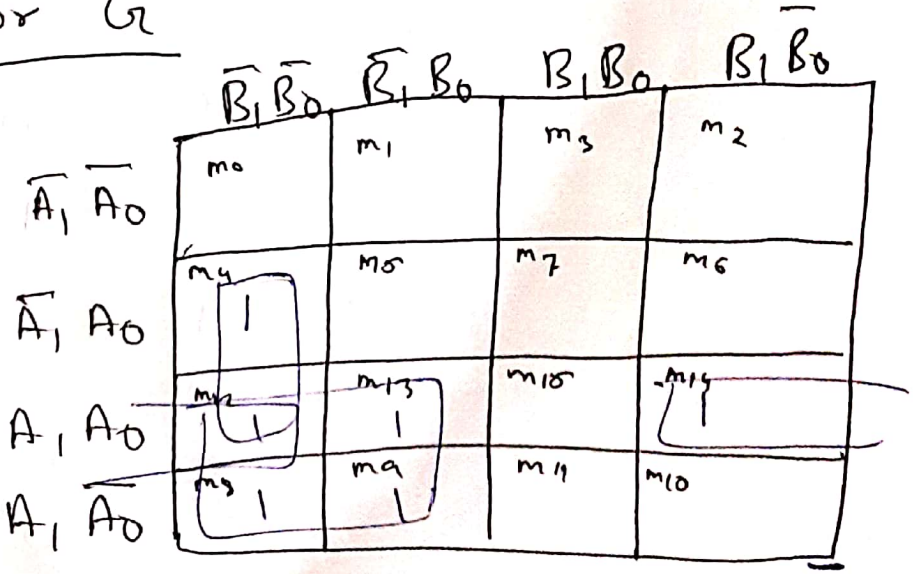
$$L = \bar{A}_1\bar{A}_0B_0 + B_1\bar{A}_1 + \cancel{\bar{B}_0\bar{A}_0B_1} \; \bar{A}_0B_1B_0$$

for E



$$E = \bar{A}_1\bar{A}_0\bar{B}_1\bar{B}_0 + \bar{A}_1A_0\bar{B}_1B_0 + A_1A_0B_1B_0 + A_1\bar{A}_0B_1\bar{B}_0$$

for G



$$G = A_1\bar{B}_1 + A_0\bar{B}_1\bar{B}_0 + A_1A_0\bar{B}_0$$

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Cy.

IC type	Required No. of Gates	Gates per IC	Required no. of ICs
74LS86 IC	3	1	3
74LS08	4	1	4
74LS32	10	1	10
74LS04	1		1
74LS02	0	0	0
Total no. of ICs			18

LAB TASK 2

4-bit full adder and full subtractor on logic works

LAB TASK 3 on logic works.

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