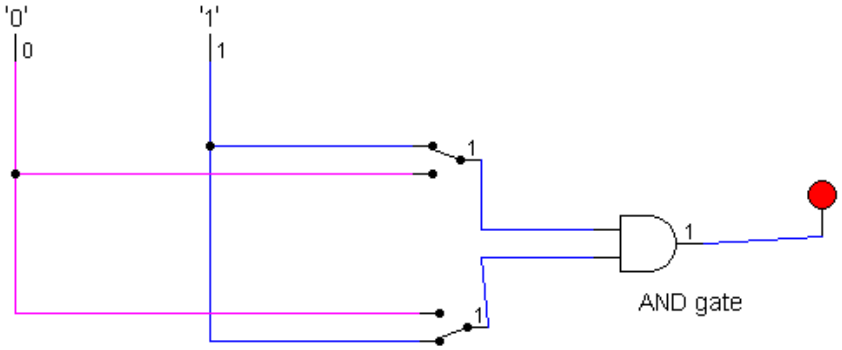
Instruction:

Complete all questions in **1 hour.**

1. Draw the logic diagram of the following gates using logsim and complete the Truth tables.
   a) AND

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



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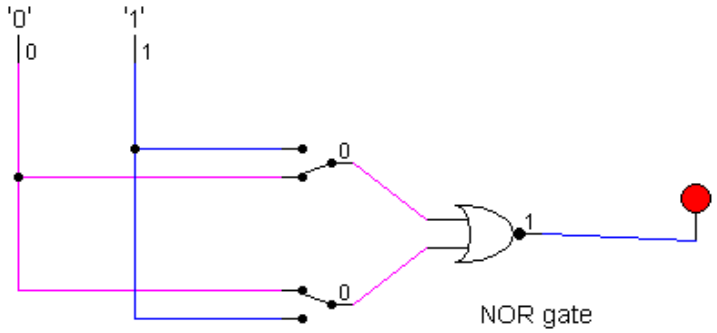
   b) NOR (do the same as in Q No a for all of the following)

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



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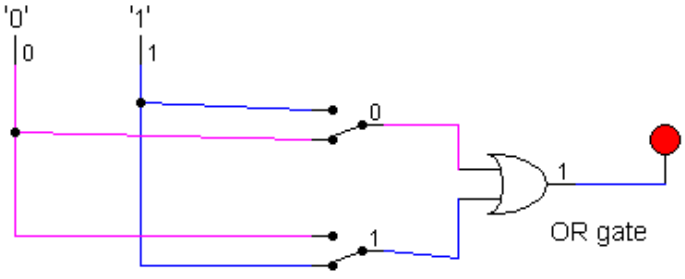
   c) OR

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



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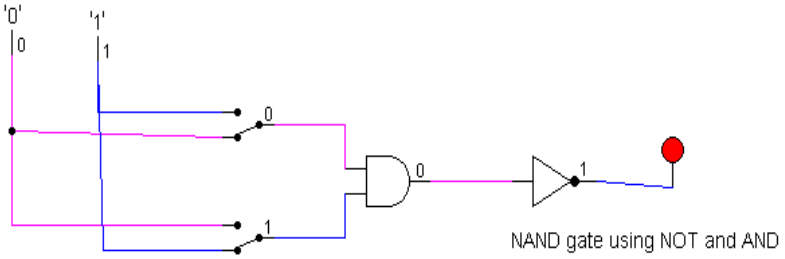
d) NAND (using NOT and AND`

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



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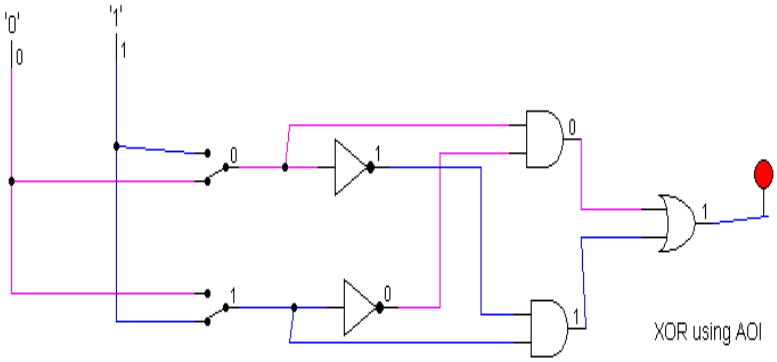
e) XOR using AOI

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



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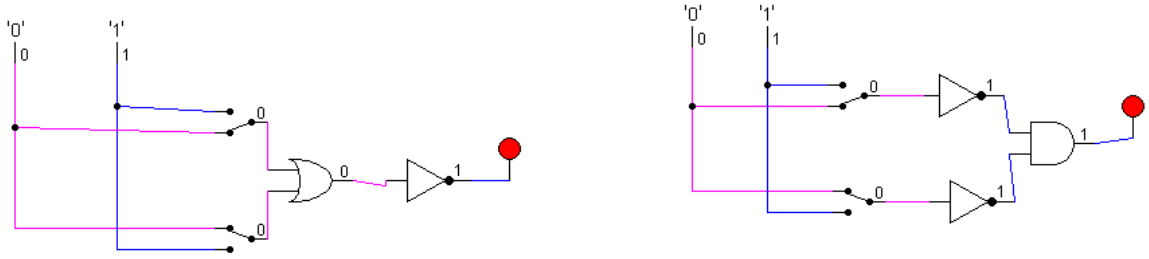
2. Use LogSim to build the equivalent circuit for the following Boolean equations. Prove that the expressions are equivalent by computing the truth table.

$!(A + B) =! A.! B$

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



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3. Draw the following circuit of half adder using LogSim

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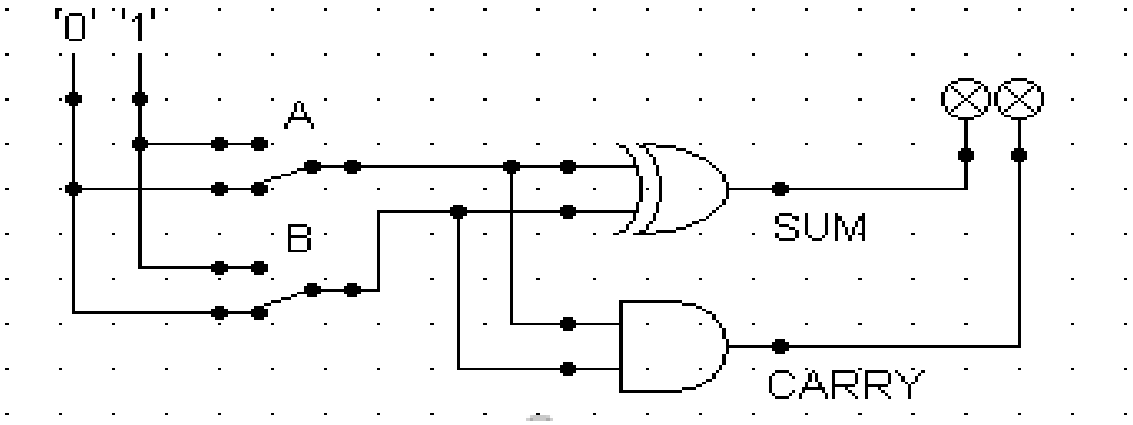
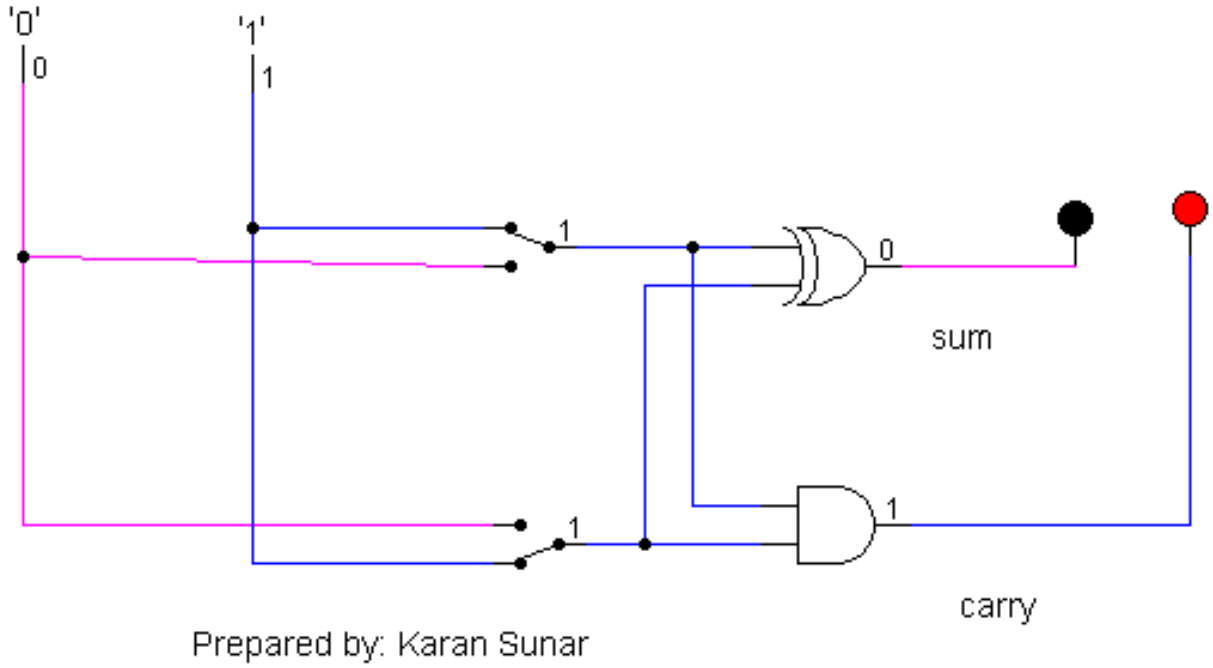
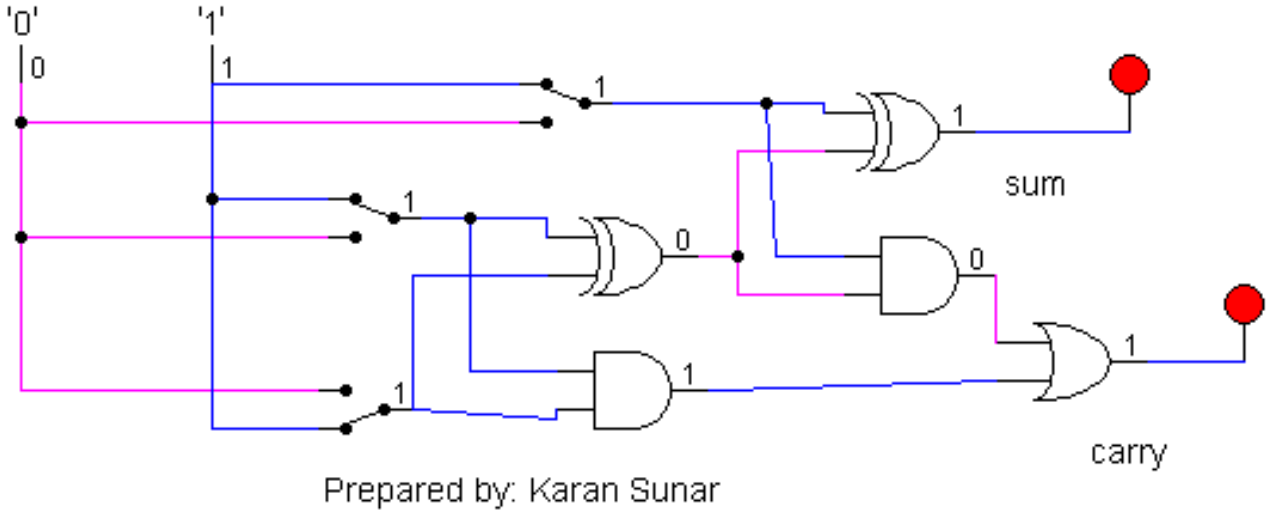




4. Draw full adder using Logsim and construct truth table.

A	B	Carry In	Sum	Carry Out
0	0	0	0	0
0	0	1	0	0
0	1	0	1	0
0	1	1	0	1
1	0	0	1	0
1	0	1	0	1
1	1	0	0	1
1	1	1	1	1



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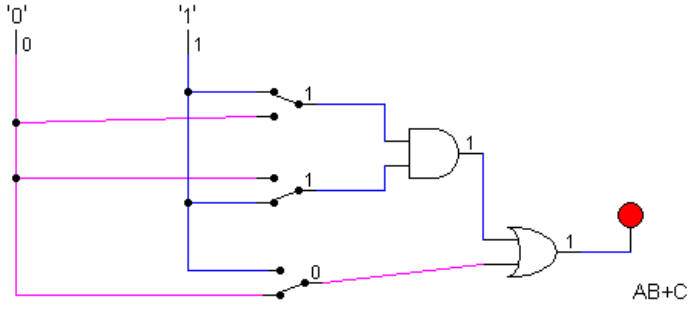
5. Draw the logic circuit for the following Boolean equations using logsim simulator.

a. AB+C



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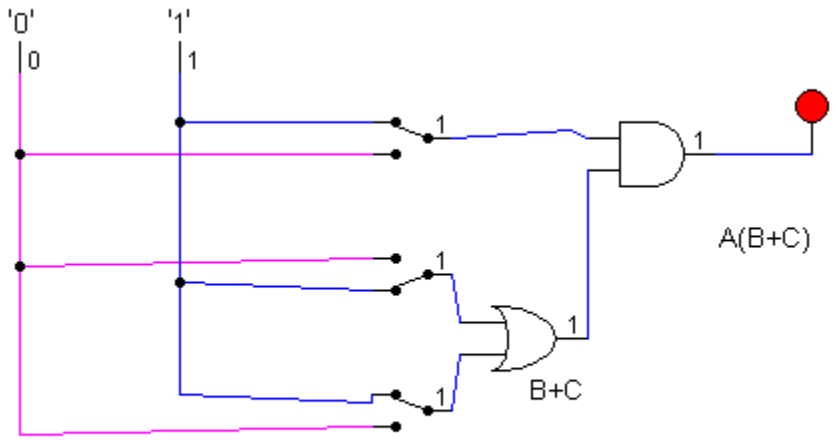
b. A(B+C)



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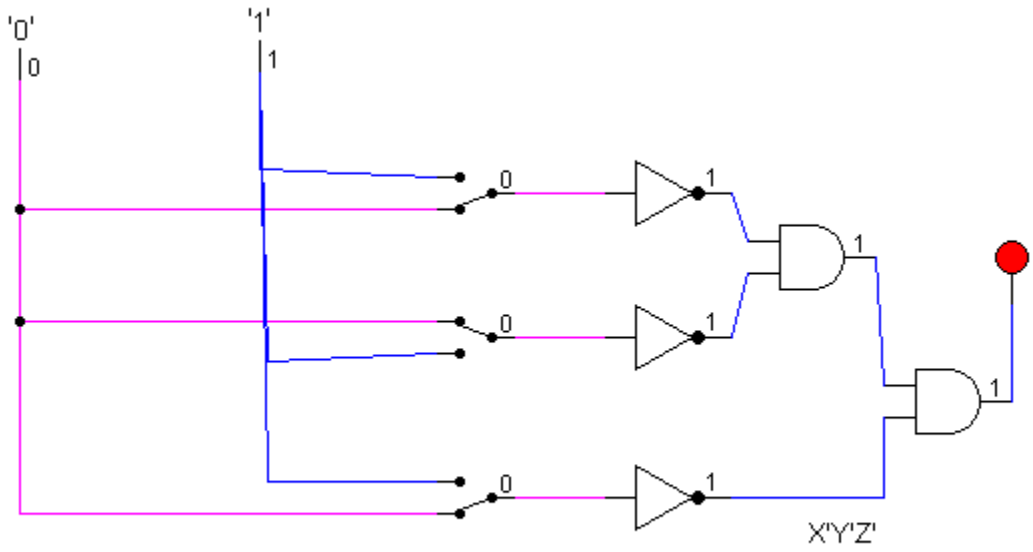
c. X'Y'Z'



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…..THANK YOU …..