

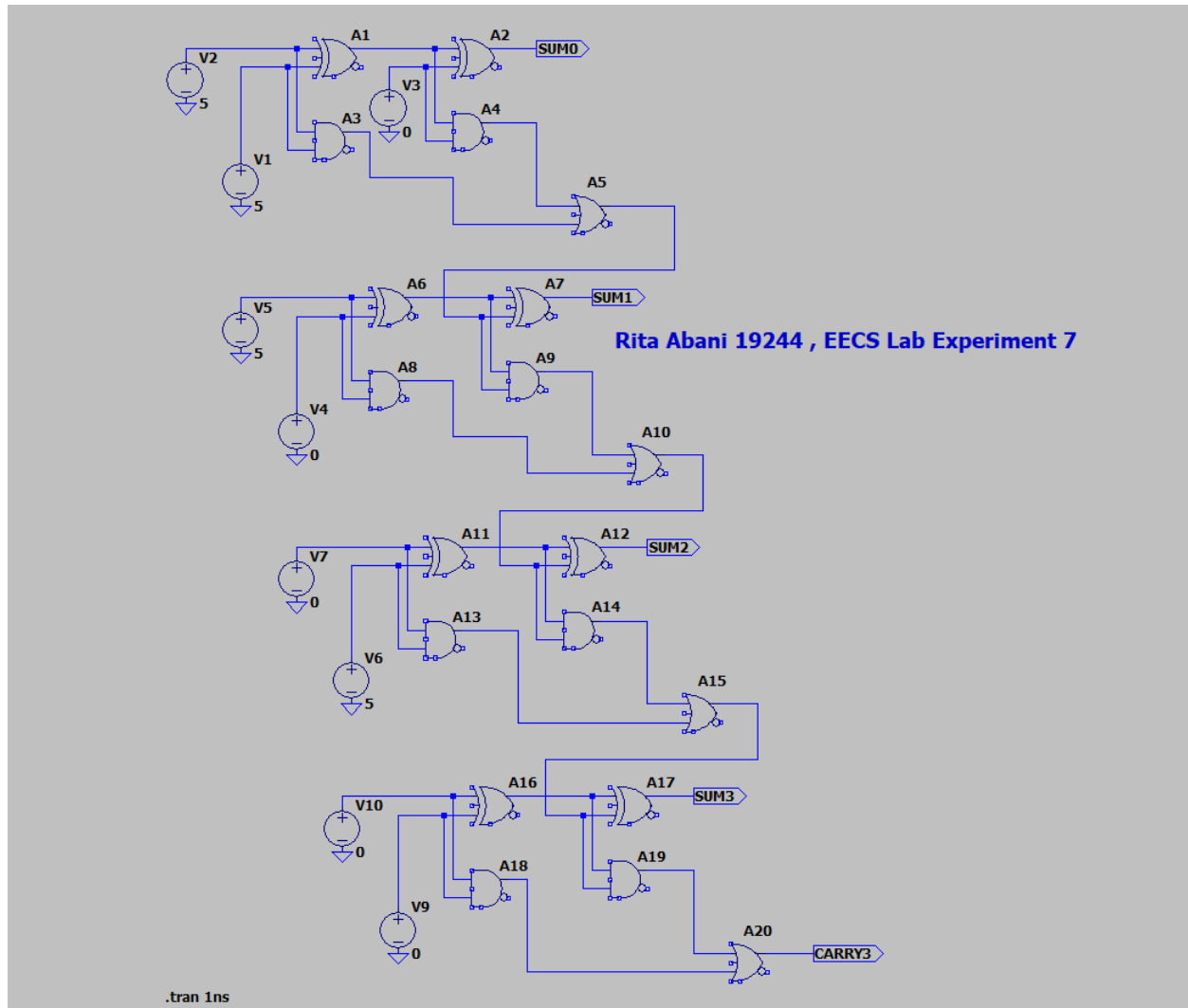
## Experiment 7 Homework: ECS 330

Rita Abani 19244

Date : 22.03.22

**Problem statement :** Design a 4-bit adder circuit in LTSpice. Perform the following additions in the circuit and show the outputs. Also, share the .asc files.

The following is the screenshot of the LTSpice Schematic



We choose 0V to be the binary 0 state and 5V to denote binary 1 state.

Now, solving the problems given to us :

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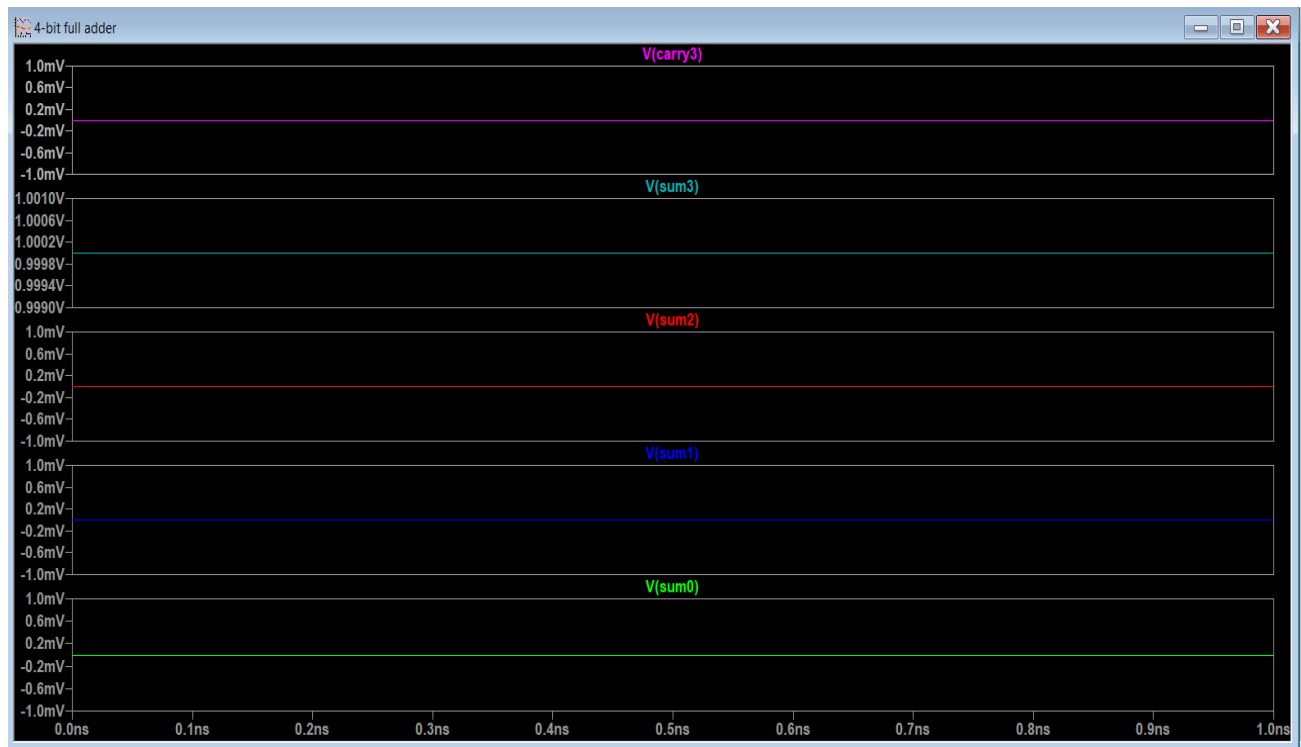
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(a) 3+5

3 in binary = 0011

5 in binary = 0101



Reading from bottom to top , we get 00010 , flipping which we get 10111 which is the binary equivalent of 23

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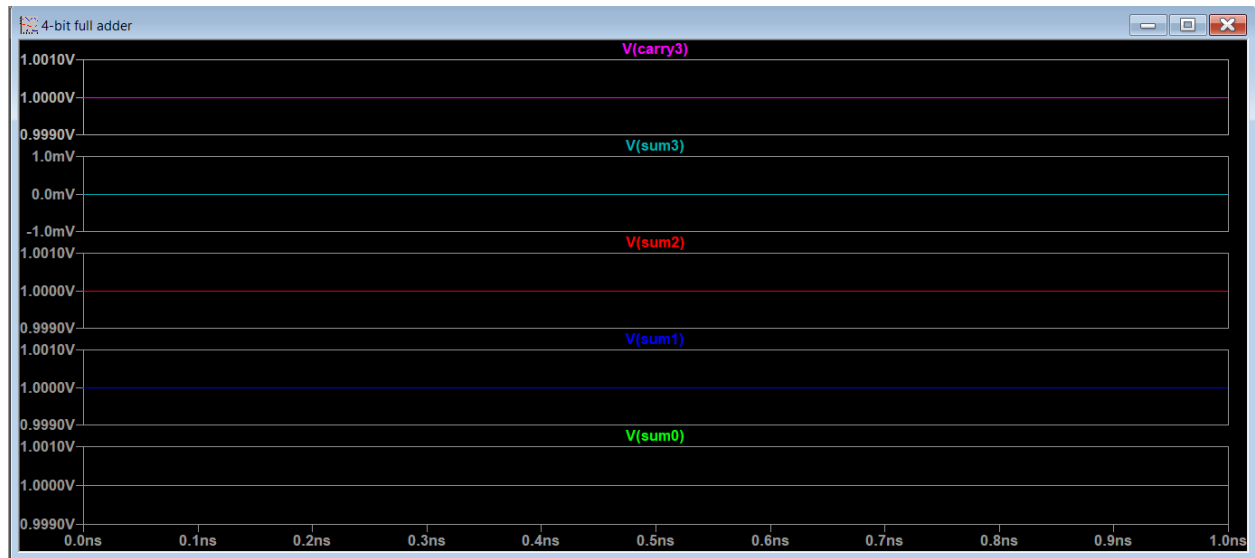
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b)  $15+1$

$15 = 1111$

$1 = 0001$



Reading from the output, we get 10000

On verifying, 10000 is 16, hence the output is correct

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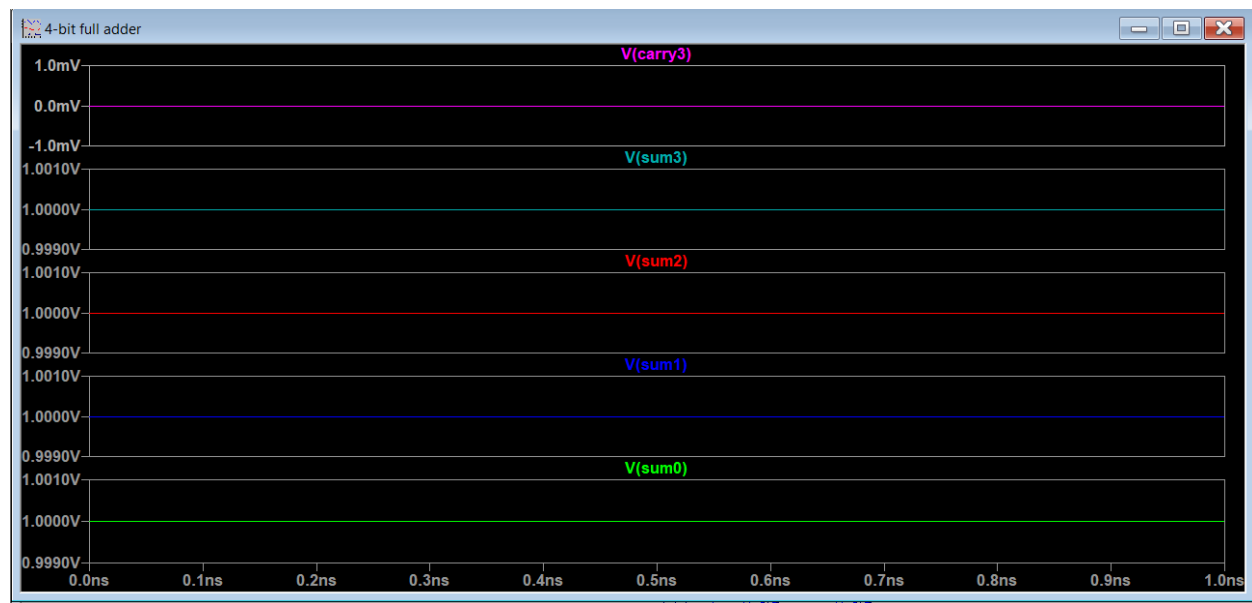
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(c)  $10+5$

$10 = 1010$

$5 = 0101$



Reading from the output we get 1111  
Which on verification is 15 in decimal

Hence output is correct

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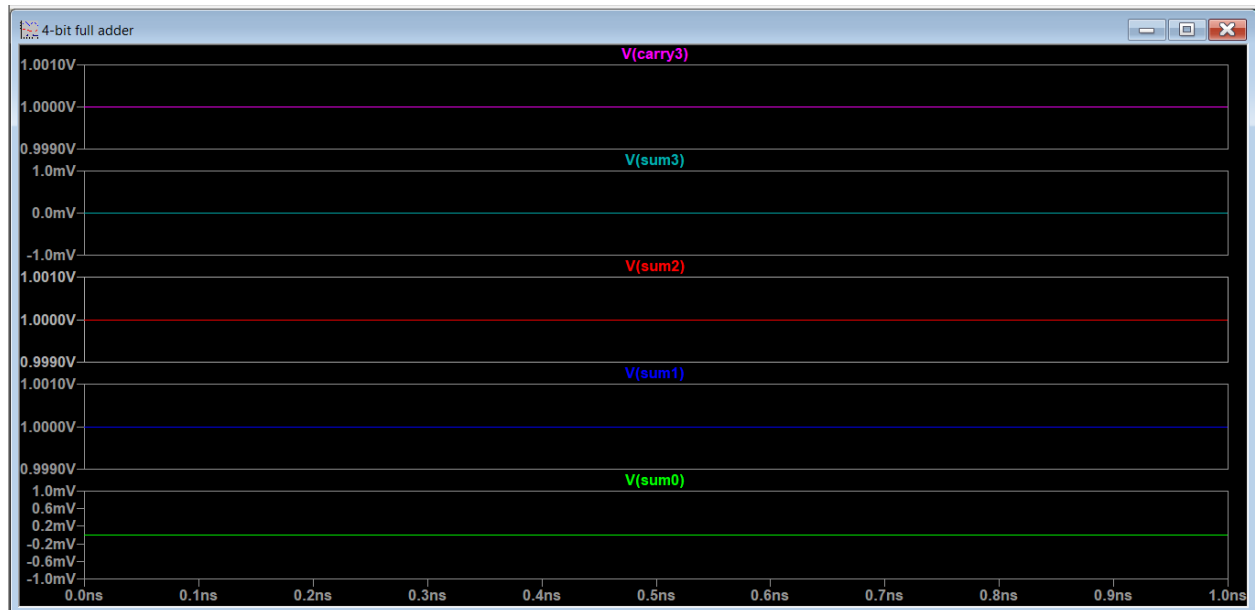
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d)  $7 + 1$

$7 = 0111$

$1 = 0001$



We get 1000 as the output

On verification, 1000 is 8 in decimal, hence our output is correct.