

Circuit Simulation Project

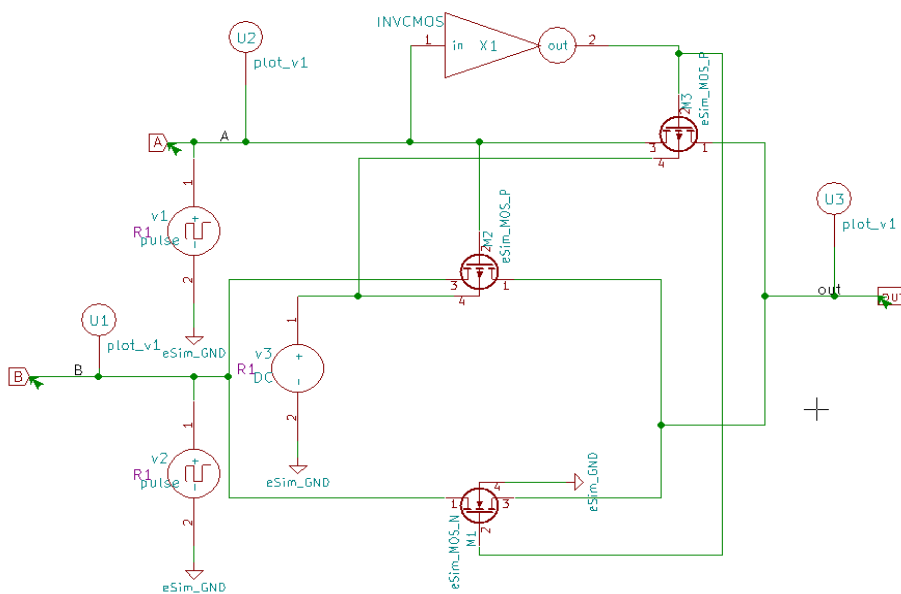
Name of the participant :Dr. Ujwala Sushil Ghodeswar

Title of the circuit : Design of Two input OR gate using Transmission gate

Theory/Description :

In this paper, we have carried out the modelling of OR gate circuit using transmission gate design i.e. $out = A+B$. This circuit is designed using 180 nm technology. The modelling includes schematics design of the above gates. Also, the simulation results of the gates are obtained. Input source applied is pulse. substrate connections of PMOS transistor is applied to vdd i.e. power supply. While NMOS transistor is applied to vss i.e. ground terminal. From the given truth table when any one input applied is logic level 1 then output is equal to logic level 1. When both the inputs are zero then output is equal to 0. All the values can be verified from the truth table.

Circuit Diagram(s) :

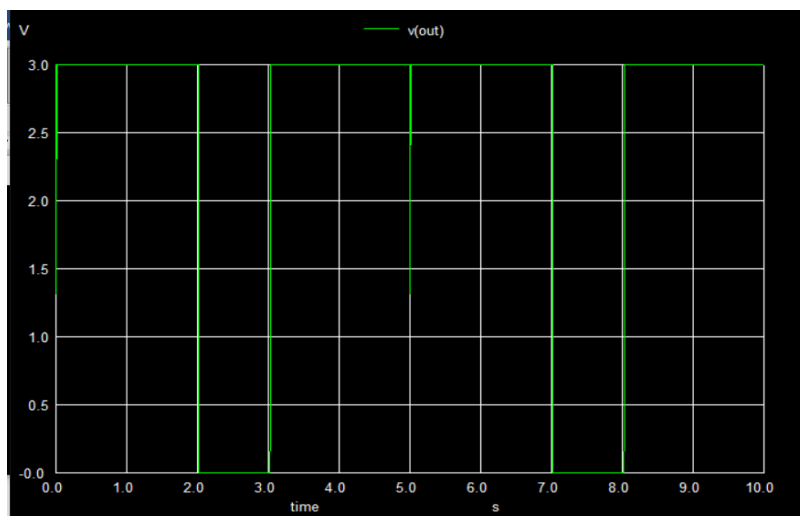
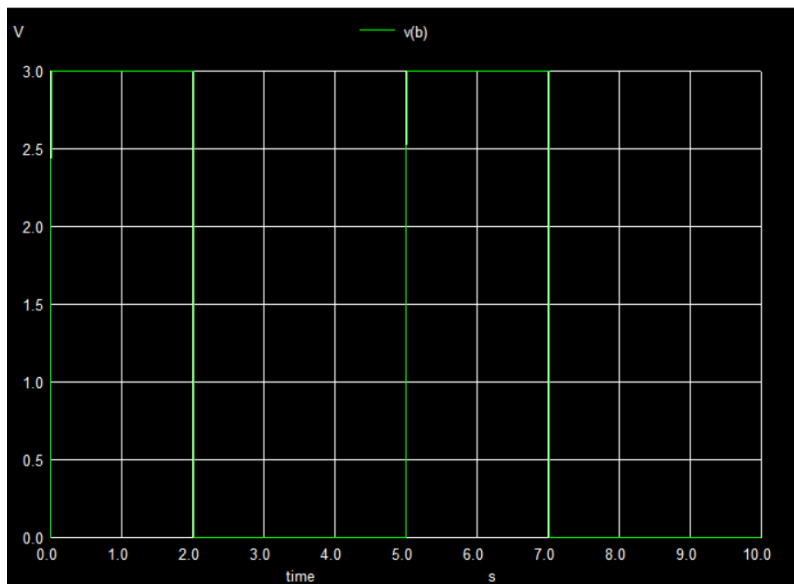
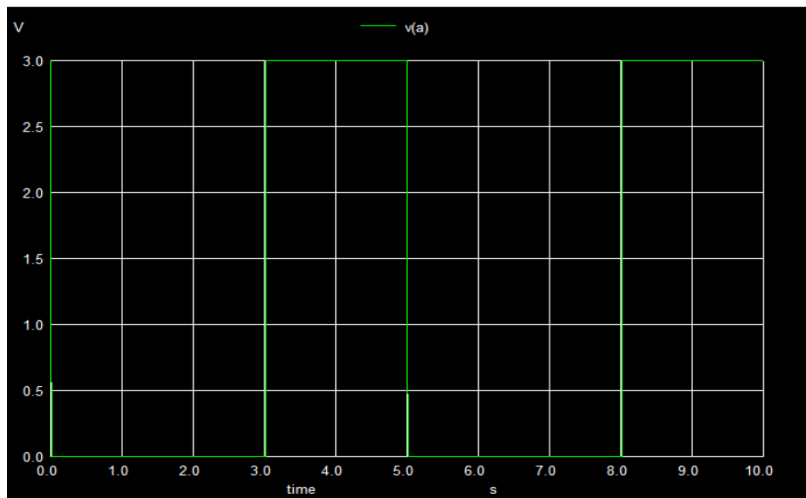


Truth Table:

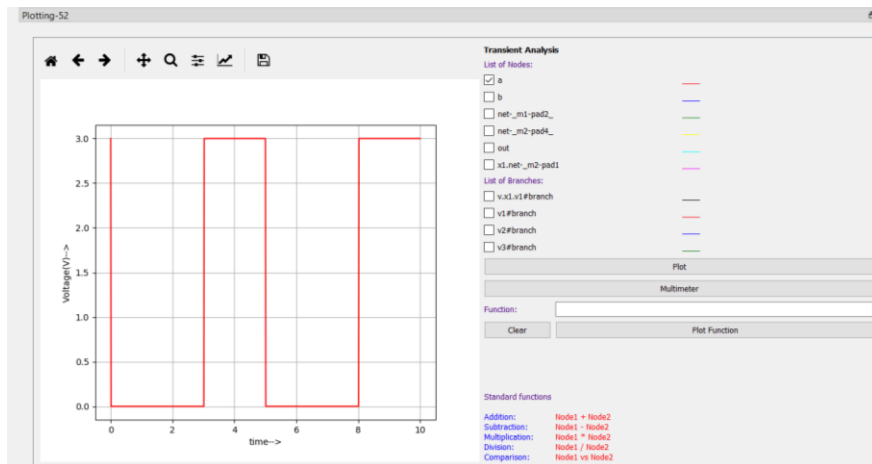
Sr.No.	Input		Output
	A	B	out
1	0	0	0
2	0	1	1
3	1	0	1
4	1	1	1

Results (Input, Output waveforms and/or Multimeter readings) :

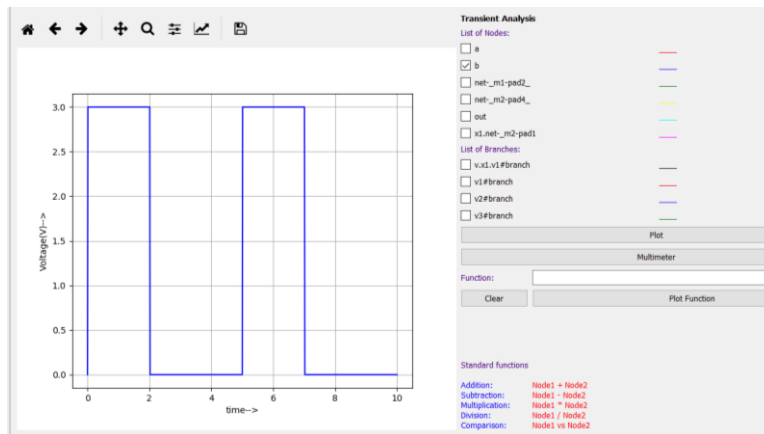
NGSPICE Plot:



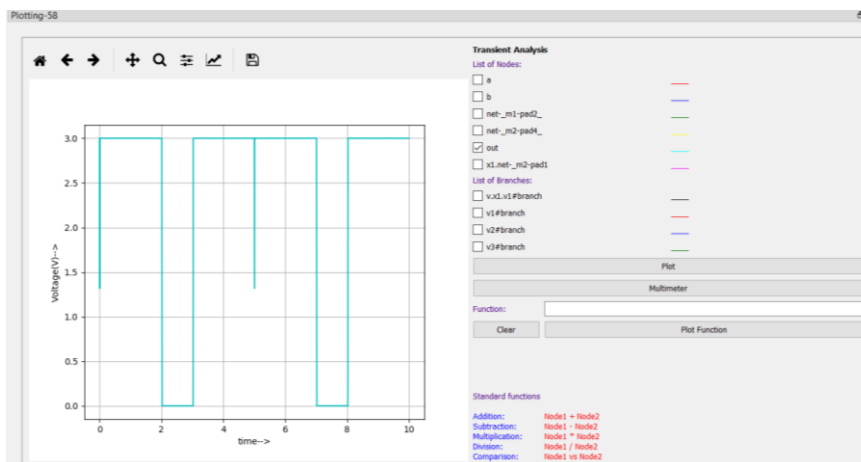
Python Plot of Input A:



Python plot of Input B



Python plot of output:



Source/Reference(s) :

1)CMOS VLSI Design A circuit and systems perspective by Neil H.E.Weste,David M.Harris. fourth edition.

Conclusion: Thus, OR gate circuit was designed using Transmission gate and output waveform obtained successfully using eSIM software.