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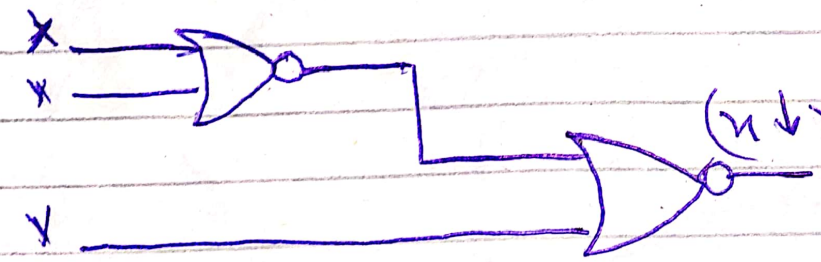
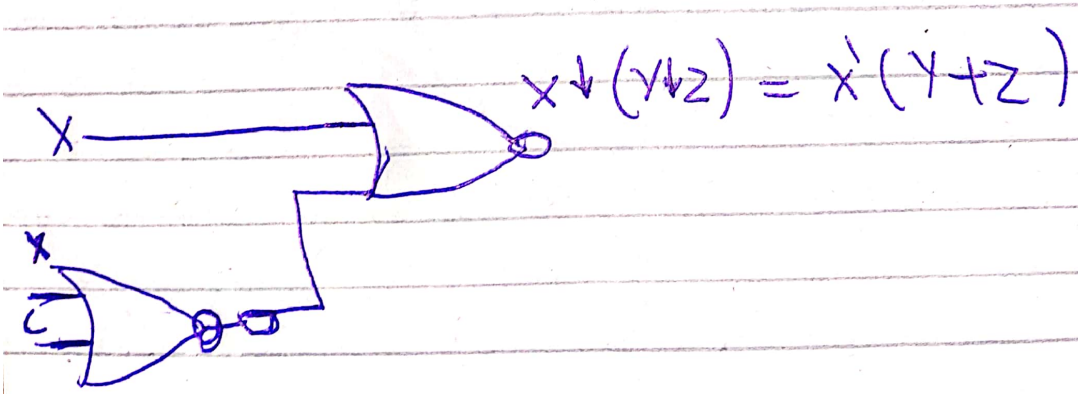
EE-387

=> The NAND and NOR functions are commutative as under and not associative.

$$(X \downarrow Y) \downarrow Z = [(X+Y)' + Z]' = (X+Y)Z' = (X+Y)Z'$$

$$X \downarrow (Y \downarrow Z) = [X + (Y+Z)']' = X'(Y+Z) = X'(Y+Z)$$





Demonstrating the non associativity of NOR operator

Shoaib
20P-0114

$$(X \downarrow Y) \downarrow Z \neq X \downarrow (Y \downarrow Z)$$

$$Z = \overline{A \cdot B \cdot C} \neq Z = \overline{(A \cdot B) \cdot C}$$

C	B	A	Z
0	0	0	1
0	0	1	1
0	1	0	1
0	1	1	1
1	0	0	1
1	0	1	1
1	1	0	1
1	1	1	0

$\neq$

C	B	A	Z
0	0	0	1
0	0	1	1
0	1	0	1
0	1	1	1
1	0	0	0
1	0	1	0
1	1	0	0
1	1	1	1

$\Rightarrow$