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Dual, Digital Logic Gates for Enriching

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ABSTRACT

In digital logic gates, there is need to introduce some vacant place of logic gates for improvisation and numerous functions wise options for better circuit designing and their logical operations, for reducing logic time, for low usage of energy, to reduce work load over components, and for better data encryption and decryption. In this research paper introduction of vacant new digital logic gates have been introduced for similar purpose.

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Let's have an overview on present digital logic gates:

Logic Gate	Description	Boolean
AND	Output is at logic 1, when and only all its inputs are at logic 1, otherwise output logic is 0.	X = (A * B)
OR	Output is at logic 1, when one or more of its inputs are at logic 1, otherwise output logic is 0.	X = (A + B)
NAND	Output is at logic 1, when and only all its inputs are at logic 0, otherwise output logic is 0.	X = (A * B)'
NOR	Output is at logic 1, when one or more of its inputs are at logic 0, otherwise output logic is 0.	X = (A + B)'
XOR	Output is at logic 1, when one and only one of its inputs are at logic 1, otherwise output logic is 0.	**X = (A + B)**
XNOR	Output is at logic 1, when one and only one of its inputs are at logic 0, otherwise output logic is 0.	**X = (A + B)'**
NOT	Output is at logic 1, when inputs are at logic 0, otherwise output logic is 0.	X = (A)'

Basic logic gates are basic fundamental gates for developing integrated circuits like microprocessor, microcontroller and different multi-purpose IC's and responsible for their operational performance and parameters values.

Let's have an overview on vacant digital logic gates:

Logic Gate (Names are given on basis of assumptions)	Description	Boolean
DO	Output is at logic 1, when and only all its inputs are at logic 1, and Output is at logic infinitive (infinitive * 1), when inputs A are at logic 1 and input B are at logic 0, otherwise output logic is 0.	X = (A / B)
DI	Output is at logic 1, when and only its inputs A are at logic 1 and its input B are at logic 0, and Output is at logic -1, when and only its inputs B are at logic 1 and its input A are at logic 0, otherwise output logic is 0.	X = (A - B)
NDO	Output is at logic 0, when and only all its inputs are at logic 1, and Output is at logic infinitive, when inputs A are at logic 0 and input B are at logic 1, otherwise output logic is 1.	X = (A / B)'
NDI	Output is at logic -1 when and only its inputs A are at logic 1 and its input B are at logic 0, and Output is at logic 1, when and only its inputs B are at logic 1 and its input A are at logic 0, otherwise output logic is 1.	X = (A - B)'
XDO	Output is at logic 1, when one of its inputs are at logic 1, and Output is at logic infinitive (infinitive * 1), when inputs A are at logic 1 or input B are at logic 0, otherwise output logic is 0.	**X = (A / B)**
XDI	Output is at logic 1, when its inputs A are at logic 1 or its input B are at logic 0, and Output is at logic -1, when its inputs B are at logic 1 or its input A are at logic 0, otherwise output logic is 0.	**X = (A - B)**
XNDO	Output is at logic 0, when one of its inputs are at logic 1, and Output is at logic infinitive, when inputs A are at logic 1 or input B are at logic 1, otherwise output logic is 1.	**X = (A / B)'**
XNDI	Output is at logic -1, when its inputs A are at logic 1 or its input B are at logic 0, and Output is at logic 1, when its inputs B are at logic 1 or its input A are at logic 0, otherwise output logic is 1.	**X = (A - B)'**

Proposed logic gates could improve basic fundamental gates for developing integrated circuits like microprocessor, microcontroller and different multi-purpose IC's and responsible for their operational performance and parameters values.

Let's have an overview on vacant digital logic gates truth table:

Data table for DO logic gate:

DO	A	B	Out
Case 1	0	0	0
Case 2	0	1	0
Case 3	1	0	infinitive
Case 4	1	1	1

Data table for DI logic gate:

DI	A	B	Out
Case 1	0	0	0
Case 2	0	1	-1
Case 3	1	0	1
Case 4	1	1	0

Data table for NDO logic gate:

NDO	A	B	Out
Case 1	0	0	1
Case 2	0	1	infinitive
Case 3	1	0	1
Case 4	1	1	0

Data table for NDI logic gate:

NDI	A	B	Out
Case 1	0	0	1
Case 2	0	1	1
Case 3	1	0	-1
Case 4	1	1	1

Data table for XDO logic gate:

XDO	A	B	Out
Case 1	0	0	0/infinitive
Case 2	0	1	1
Case 3	1	0	1/Infinitive
Case 4	1	1	1/infinitive

Data table for XDI logic gate:

XDI	A	B	Out
Case 1	0	0	0/-1/1
Case 2	0	1	-1
Case 3	1	0	1
Case 4	1	1	0/-1/1

Data table for XNDO logic gate:

XNDO	A	B	Out
Case 1	0	0	1
Case 2	0	1	0.infinitive
Case 3	1	0	0/infinitive
Case 4	1	1	0/infinitive

Data table for XNDI logic gate:

XNDI	A	B	Out
Case 1	0	0	1/-1
Case 2	0	1	-1/1
Case 3	1	0	-1/1
Case 4	1	1	1/-1

Conclusion:

With the help of new logic gates design, there is ease in new digital circuit logic process and also could be very useful in time, material, function saving options for logic developers. Apart from that ease in data storage and analysis and multiple functions operation facilities in microcontroller and microprocessor and different electronic ICs.

References:

[1] DIGITAL LOGIC DESIGN, GTU, BY S. SALIVAHANAN