

4. 진리표(Truth Table)

	Gate	Set(집합)	Truth(진리식)	Truth Table(진리표)	Karnaugh Map(카르노맵)	Time Chart																																				
Direct			$Q = A$	<table><tr><th>A</th><th>Q</th></tr><tr><td>0</td><td>0</td></tr><tr><td>1</td><td>1</td></tr></table>	A	Q	0	0	1	1																																
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0	0																																									
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NOT			$Q = \bar{A}$	<table><tr><th>A</th><th>Q</th></tr><tr><td>0</td><td>1</td></tr><tr><td>1</td><td>0</td></tr></table>	A	Q	0	1	1	0																																
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POSITIVE																																										
NEGATIVE																																										
AND			$Q = A * B$	<table><tr><th>A</th><th>B</th><th>Q</th></tr><tr><td>0</td><td>0</td><td>0</td></tr><tr><td>0</td><td>1</td><td>0</td></tr><tr><td>1</td><td>0</td><td>0</td></tr><tr><td>1</td><td>1</td><td>1</td></tr></table>	A	B	Q	0	0	0	0	1	0	1	0	0	1	1	1																							
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OR			$Q = A + B$	<table><tr><th>A</th><th>B</th><th>Q</th></tr><tr><td>0</td><td>0</td><td>0</td></tr><tr><td>0</td><td>1</td><td>1</td></tr><tr><td>1</td><td>0</td><td>1</td></tr><tr><td>1</td><td>1</td><td>1</td></tr></table>	A	B	Q	0	0	0	0	1	1	1	0	1	1	1	1	 $Q = A * (\bar{B} + B) + (\bar{A} + A) * B$																						
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XOR (Exclusive OR)			$Q = A \oplus B$ $= A\bar{B} + \bar{A}B$	<table><tr><th>A</th><th>B</th><th>Q</th></tr><tr><td>0</td><td>0</td><td>0</td></tr><tr><td>0</td><td>1</td><td>1</td></tr><tr><td>1</td><td>0</td><td>1</td></tr><tr><td>1</td><td>1</td><td>0</td></tr></table>	A	B	Q	0	0	0	0	1	1	1	0	1	1	1	0	 $Q = A * \bar{B} + \bar{A} * B$																						
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INOR (Inclusive OR)			$Q = A \odot B$ $= \bar{A}\bar{B} + AB$	<table><tr><th>A</th><th>B</th><th>Q</th></tr><tr><td>0</td><td>0</td><td>1</td></tr><tr><td>0</td><td>1</td><td>0</td></tr><tr><td>1</td><td>0</td><td>0</td></tr><tr><td>1</td><td>1</td><td>1</td></tr></table>	A	B	Q	0	0	1	0	1	0	1	0	0	1	1	1	 $Q = \bar{A} * \bar{B} + A * B$																						
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NAND = Not OR			$Q = \overline{A * B}$ $= \bar{A} + \bar{B}$	<table><tr><th>A</th><th>B</th><th>Q</th></tr><tr><td>0</td><td>0</td><td>1</td></tr><tr><td>0</td><td>1</td><td>1</td></tr><tr><td>1</td><td>0</td><td>1</td></tr><tr><td>1</td><td>1</td><td>0</td></tr></table>	A	B	Q	0	0	1	0	1	1	1	0	1	1	1	0	 $Q = (A + \bar{A}) * \bar{B} + \bar{A} * (B + \bar{B})$																						
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S-R FLIP FLOP			$Q = (A + Q) * \bar{B}$	<table><tr><th>A</th><th>B</th><th>Q<sup>n</sup></th><th>Q<sup>n+1</sup></th></tr><tr><td>0</td><td>0</td><td>0</td><td>0</td></tr><tr><td>0</td><td>0</td><td>1</td><td>1</td></tr><tr><td>0</td><td>1</td><td>0</td><td>0</td></tr><tr><td>0</td><td>1</td><td>1</td><td>0</td></tr><tr><td>1</td><td>0</td><td>0</td><td>1</td></tr><tr><td>1</td><td>0</td><td>1</td><td>1</td></tr><tr><td>1</td><td>1</td><td>0</td><td>0</td></tr><tr><td>1</td><td>1</td><td>1</td><td>0</td></tr></table>	A	B	Q <sup>n</sup>	Q <sup>n+1</sup>	0	0	0	0	0	0	1	1	0	1	0	0	0	1	1	0	1	0	0	1	1	0	1	1	1	1	0	0	1	1	1	0	 $Q = A * \bar{B} * (\bar{Q} + Q) + (\bar{A} + A) * \bar{B} * Q$	
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TOGGLE MEMORY			$Q = \bar{A}Q + A\bar{Q}$	<table><tr><th>A</th><th>Q<sup>n</sup></th><th>Q<sup>n+1</sup></th></tr><tr><td>0</td><td>Q<sup>n</sup></td><td>Q<sup>n</sup></td></tr><tr><td>1</td><td>Q<sup>n</sup></td><td><math>\bar{Q}^n</math></td></tr></table>	A	Q <sup>n</sup>	Q <sup>n+1</sup>	0	Q <sup>n</sup>	Q <sup>n</sup>	1	Q <sup>n</sup>	$\bar{Q}^n$																													
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