

4. 진리표(Truth Table)

	Gate	Set(집합)	Truth(진리식)	Truth Table(진리표)	Karnaugh Map(카르노맵)	Time Chart																																				
◆ 4-1	Direct 		$Q = A$	<table border="1"><tr><td>A</td><td>Q</td></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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◆ 4-2	NOT 		$Q = \bar{A}$	<table border="1"><tr><td>A</td><td>Q</td></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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◆ 4-3	POSITIVE 																																									
◆ 4-4	NEGATIVE 																																									
◆ 4-5	AND 		$Q = A * B$	<table border="1"><tr><td>A</td><td>B</td><td>Q</td></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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◆ 4-6	OR 		$Q = A + B$	<table border="1"><tr><td>A</td><td>B</td><td>Q</td></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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◆ 4-7	XOR (Exclusive OR) 		$Q = A \oplus B$ $= A\bar{B} + \bar{A}B$	<table border="1"><tr><td>A</td><td>B</td><td>Q</td></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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◆ 4-8	INOR (Inclusive OR) 		$Q = A \odot B$ $= \bar{A}\bar{B} + AB$	<table border="1"><tr><td>A</td><td>B</td><td>Q</td></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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◆ 4-9	NAND = Not OR 		$Q = \overline{A * B}$ $= \bar{A} + \bar{B}$	<table border="1"><tr><td>A</td><td>B</td><td>Q</td></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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◆ 4-10	NOR = Not AND 		$Q = \overline{A + B}$ $= \bar{A} * \bar{B}$	<table border="1"><tr><td>A</td><td>B</td><td>Q</td></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>0</td></tr></table>	A	B	Q	0	0	1	0	1	0	1	0	0	1	1	0																							
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◆ 4-11	S-R FLIP FLOP 		$Q = (A + Q) * \bar{B}$	<table border="1"><tr><td>A</td><td>B</td><td>Qⁿ</td><td>Qⁿ⁺¹</td></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>0</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>1</td></tr></table>	A	B	Q ⁿ	Q ⁿ⁺¹	0	0	0	0	0	0	1	1	0	1	0	0	0	1	1	0	1	0	0	0	1	0	1	1	1	1	0	0	1	1	1	1	$Q = A * \bar{B} * (\bar{Q} + Q) + (\bar{A} + A) * \bar{B} * Q$ 	
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◆ 4-12	TOGGLE MEMORY 		$Q = \bar{A}Q + A\bar{Q}$	<table border="1"><tr><td>A</td><td>Qⁿ</td><td>Qⁿ⁺¹</td></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	Q ⁿ	Q ⁿ⁺¹	0	0	0	0	1	1	1	0	1	1	1	0																							
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