

EXPT NO. : 1

AIM:

To study about logic gates and verify their truth tables.

APPARATUS REQUIRED:

SL No.	COMPONENT	SPECIFICATION	QTY.
1.	AND GATE 2 I/P	IC 7408	1
2.	AND GATE 3 I/P	IC 7411	1
3.	OR GATE	IC 7432	1
4.	NOT GATE	IC 7404	1
5.	NAND GATE	IC 7400	1
6.	NOR GATE	IC 7402	1
7.	X-OR GATE	IC 7486	1
8.	BREAD BOARD	-	1
9.	PATCH CORDS	-	-
10.	POWER SUPPLY WITH LOGIC PROBE	-	1

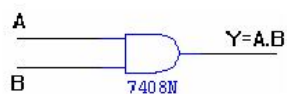
THEORY: Circuit that takes the logical decision and the process are called logic gates. Each gate has one or more input and only one output.

OR, AND & NOT are basic gates. NAND, NOR and X-OR are known as universal gates. Basic gates form these gates.

AND GATE: The AND gate performs a logical multiplication commonly known as AND function. The output is high when all of its inputs are high. The output is at low level when any one of the inputs is low.

2-INPUT AND GATE:

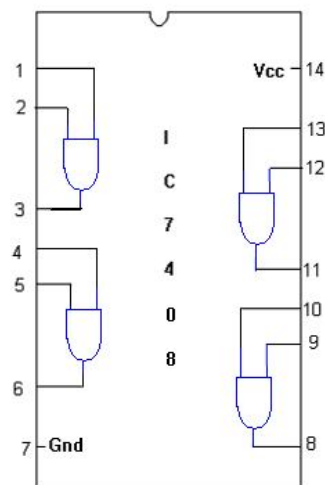
SYMBOL:



TRUTH TABLE

A	B	A.B
0	0	0
0	1	0
1	0	0
1	1	1

PIN DIAGRAM:



3-INPUT AND GATE:

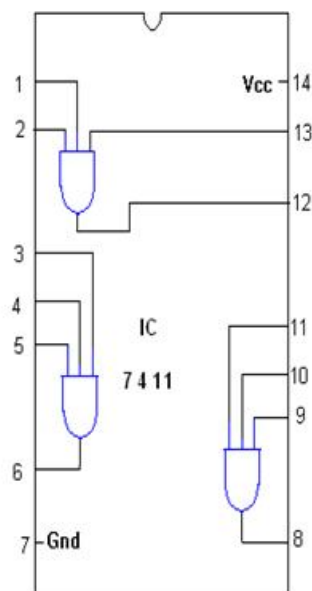
SYMBOL :



TRUTH TABLE

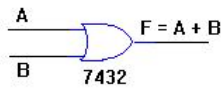
A	B	C	A.B.C
0	0	0	0
0	0	1	0
0	1	0	0
0	1	1	0
1	0	0	0
1	0	1	0
1	1	0	0
1	1	1	1

PIN DIAGRAM:



OR GATE: The OR gate performs a logical addition commonly known as OR function. The output is high when any one of the inputs is high. The output is low level when both the inputs are low.

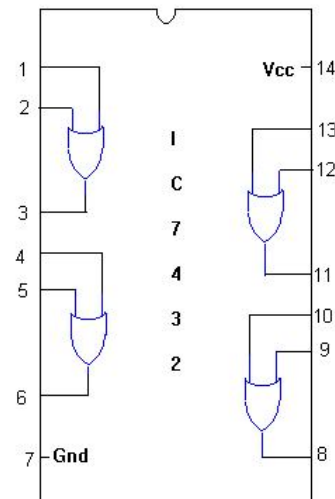
SYMBOL :



TRUTH TABLE

A	B	A+B
0	0	0
0	1	1
1	0	1
1	1	1

PIN DIAGRAM :



NOT GATE: The NOT gate is called an inverter. The output is high when the input is low. The output is low when the input is high.

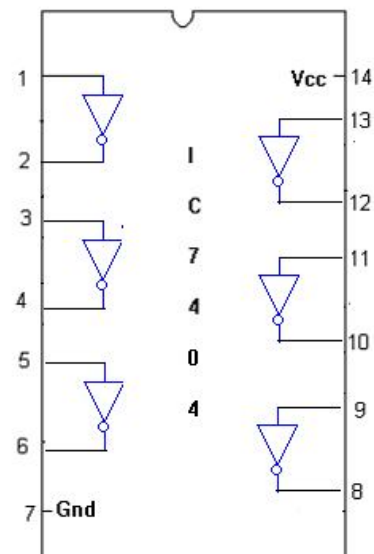
SYMBOL:



TRUTH TABLE :

A	\overline{A}
0	1
1	0

PIN DIAGRAM:



X-OR GATE: The output is high when any one of the inputs is high. The output is low when both the inputs are low and both the inputs are high.

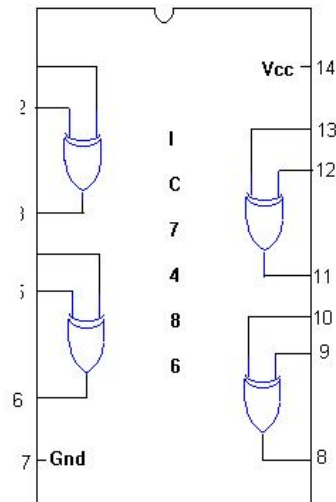
SYMBOL:



TRUTH TABLE :

A	B	$\overline{A}B + A\overline{B}$
0	0	0
0	1	1
1	0	1
1	1	0

PIN DIAGRAM:



NAND GATE: The NAND gate is a contraction of AND-NOT. The output is high when both inputs are low and any one of the input is low. The output is low level when both inputs are high.

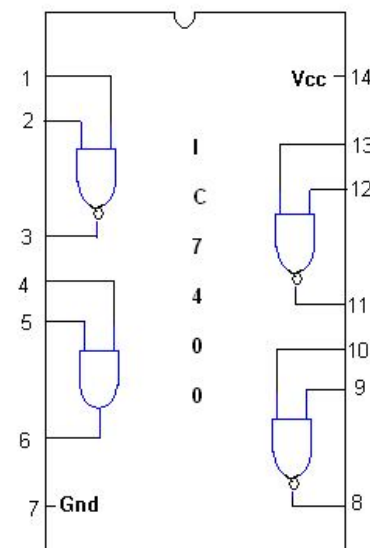
SYMBOL:



TRUTH TABLE

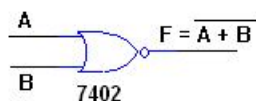
A	B	$\overline{A \cdot B}$
0	0	1
0	1	1
1	0	1
1	1	0

PIN DIAGRAM:



NOR GATE: The NOR gate is a contraction of OR-NOT. The output is high when both inputs are low. The output is low when one or both inputs are high.

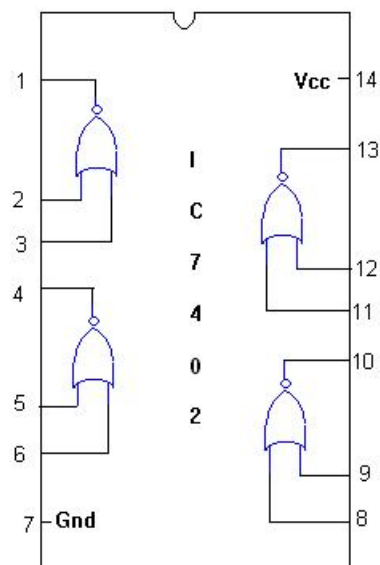
SYMBOL :



TRUTH TABLE

A	B	$\overline{A+B}$
0	0	1
0	1	1
1	0	1
1	1	0

PIN DIAGRAM:



OBSERVATION TABLE:

GATE	INPUT			OUTPUT
	A	B	C	Y
AND Gate (2 I/P)				
AND Gate (3 I/P)				
OR Gate				
NOT Gate				
X-OR Gate				
NAND Gate				
NOR Gate				