EXPERIMENT NO- 1

AIM: To verify the operation of all logic gates with truth table.

Gates	IC NO.
AND	7408
OR	7432
NAND	7400
NOR	7402
NOT	7404
XOR	74136 7486

RESOURCE REQUIRED: Digital Lab Kit, ICs, breadboards, Connecting Wires.

THEORY: Logic gates are idealized or physical devices implementing a Boolean function, which it performs a logical operation on one or more logical inputs and produce a single output. Depending on the context, the term may refer to an ideal logic gate, one that has for instance zero rise time and unlimited fan out or it may refer to a non-ideal physical device.

The main hierarchy is as follows:

a. Basic Gates

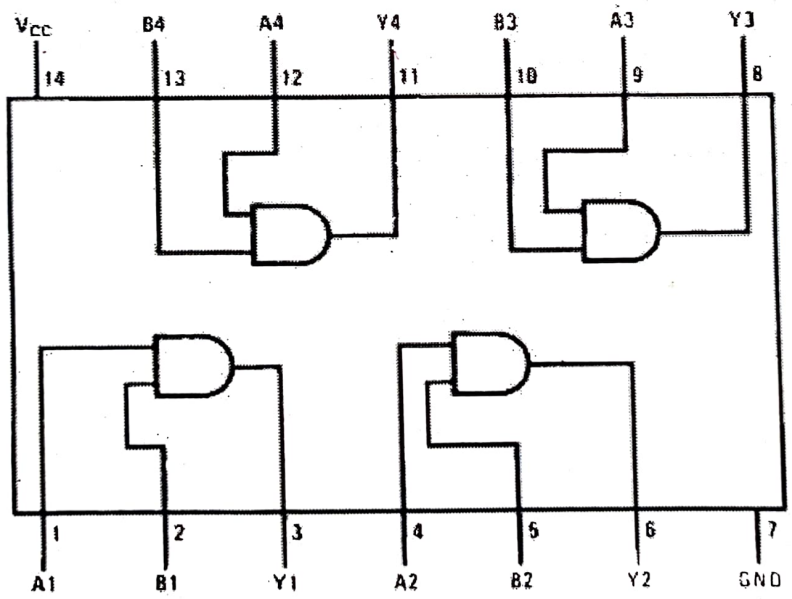
b. Universal Gate

BASIC GATES:

a. **AND gate:** Function of AND gate is to give the output true when both the inputs are true. In all the other remaining cases output becomes false. Following table justifies the statement:

Input A	Input B	Output
1	1	1
1	0	0
0	1	0
0	0	0

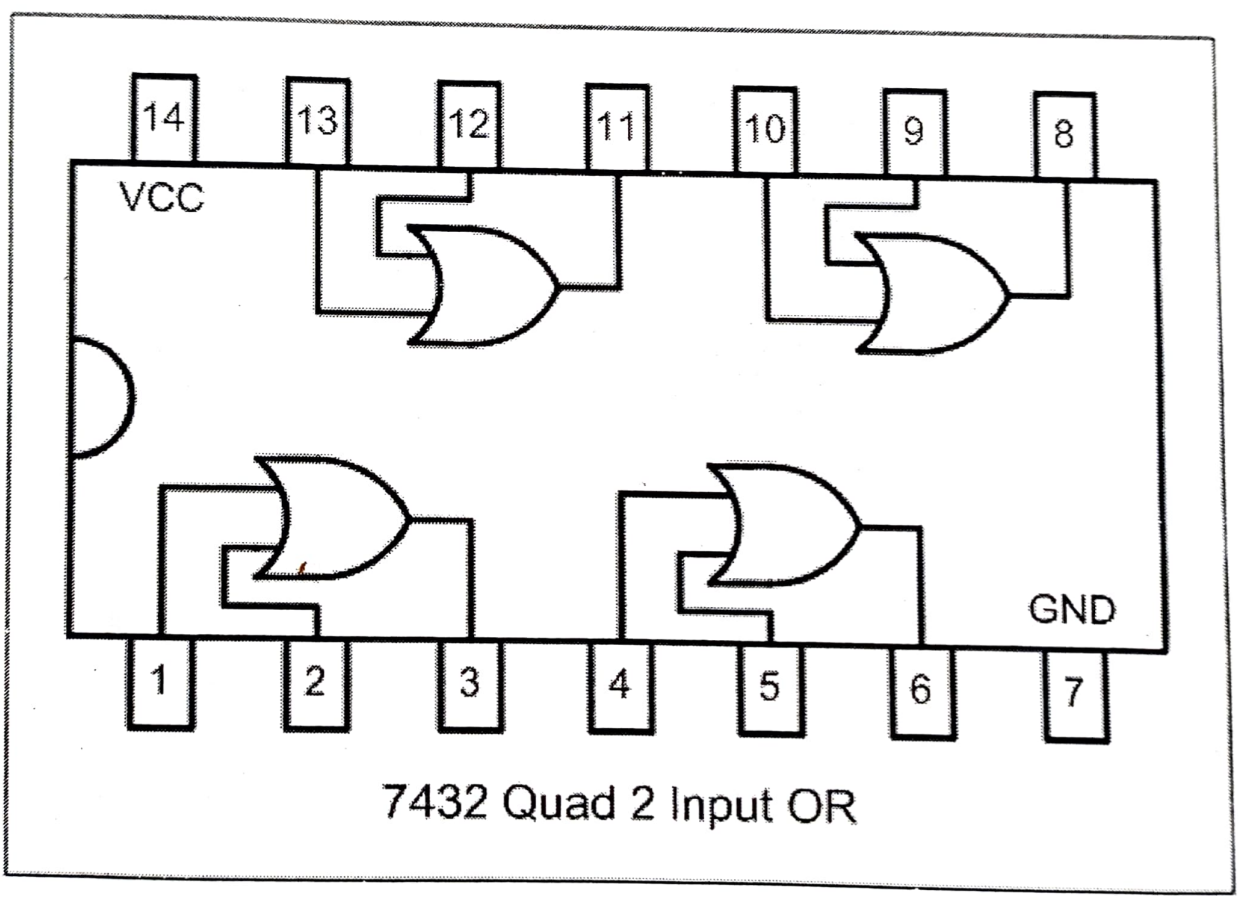
Dual-In-Line Package



IC 7408

b. OR gate: Function of OR gate is to give output true when one of the either inputs are true. In the remaining case output becomes false. Following table justify the statement:

Input A	Input B	Output
0	0	0
0	1	1
1	0	1
1	1	1

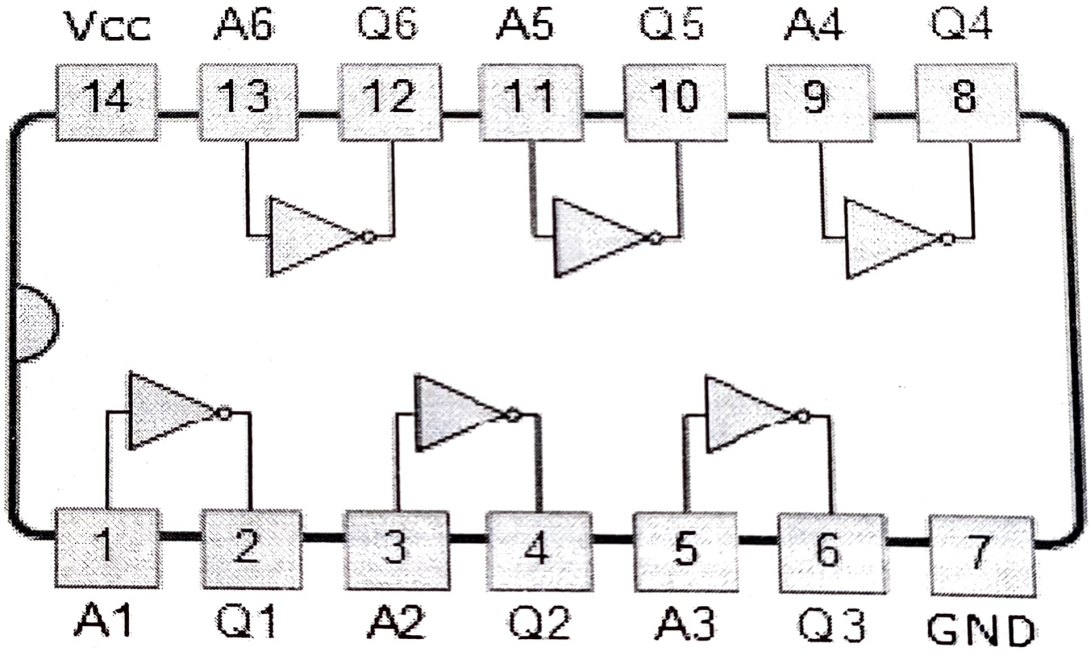


7432 Quad 2 Input OR

IC 7432

c. **NOT gate:** Function of NOR gate is to reverse the nature of the input. It converts true input to false and vice versa. Following table justifies the statement:

Input	Output
1	0
0	1

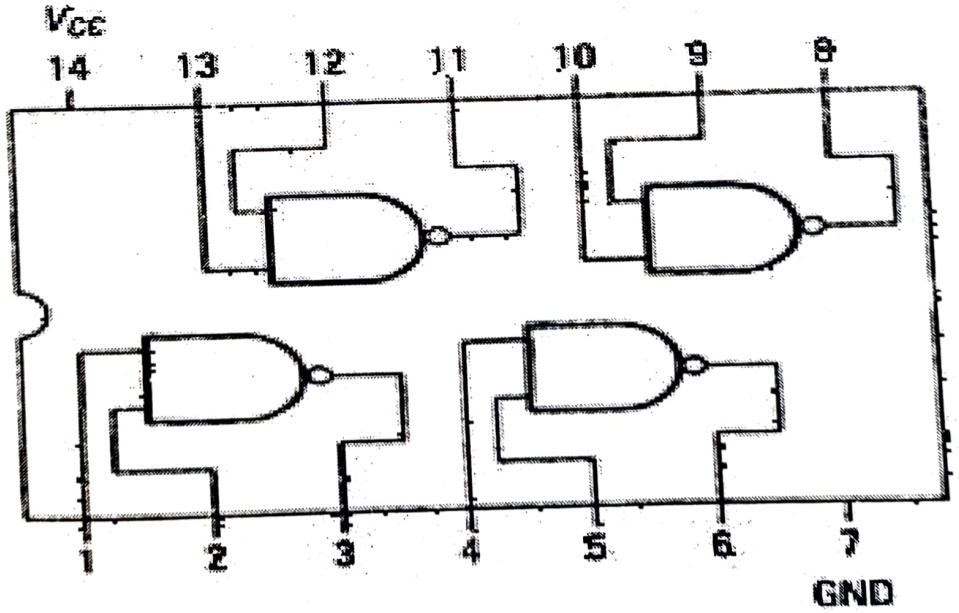


IC 7404

UNIVERSAL GATES

a. **NAND gate:** function of NAND gate is to give true output when one of the two provided input are false. In the remaining output is true case. Following table justifies the statement:

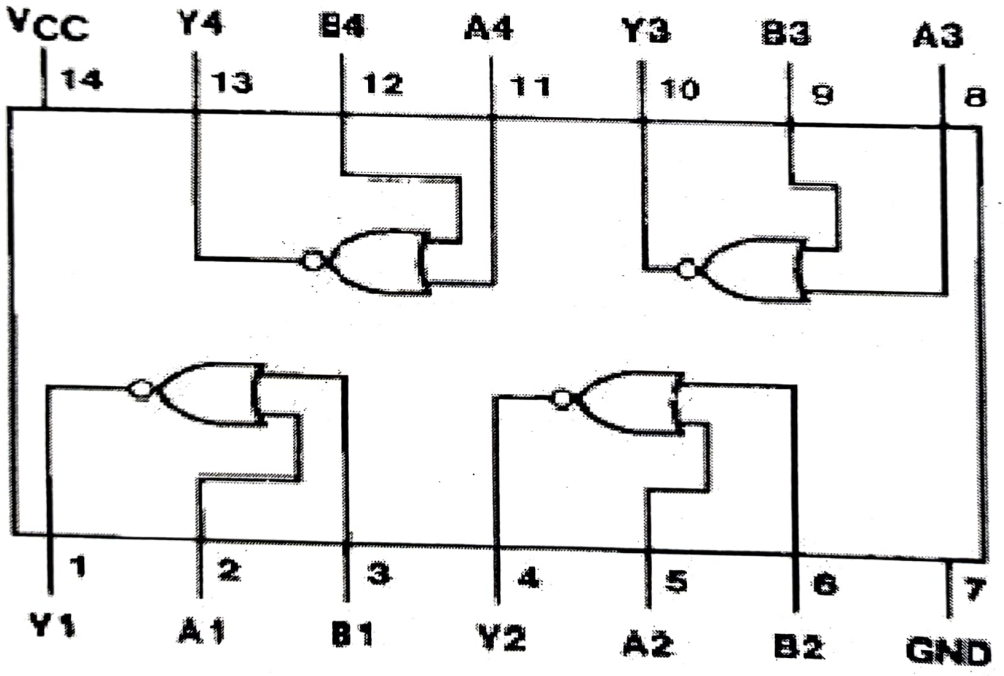
Input A	Input B	Output
1	1	0
1	0	1
0	1	1
0	0	1



IC 7400

b. **NOR gate:** NOR gate gives the output true when both the two provided input are false. In all the other cases output remains false. Following table justifies the statement:

Input A	Input B	Output
1	1	0
1	0	0
0	1	0
0	0	1



IC 7402

PROCEDURE:

a. Place the IC on IC Trainer Kit.
b. Connect VCC and ground to respective pins of IC Trainer Kit.
c. Connect the inputs to the input switches provided in the IC Trainer Kit.
d. Connect the outputs to the switches of O/P LEDs,
e. Apply various combinations of inputs according to the truth table and observe condition of LEDs.

RESULT: All gates are verified. Observed output matches theoretical concepts.

CONCLUSION: Thus, we have studied & verify the truth table of basic gates, universal gates & special gates