Logic Gate

Digital Electronics Laboratory

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Experiment 1

Basic Logic Gates with TESCA board 38609.

Objectives: Truth Table Verification

1. To implement the basic logic gate circuits and verify all operation & the truth tables.
2. To implement an INVERTER using NAND or NOR gates
3. To implement an OR gate using NAND gates

Apparatus:

- TESCA board 38609.
- connecting wires.

Theory:

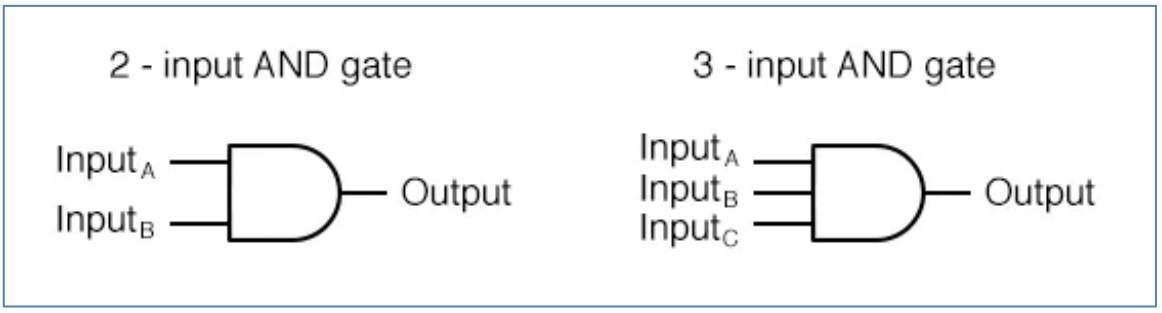
Logic gates are idealized or physical devices implementing a Boolean function, which it performs a logical operation on one or more logical inputs and produce a single output. Depending on the context, the term may refer to an ideal logic gate, one that has for instance zero rise time and unlimited fan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

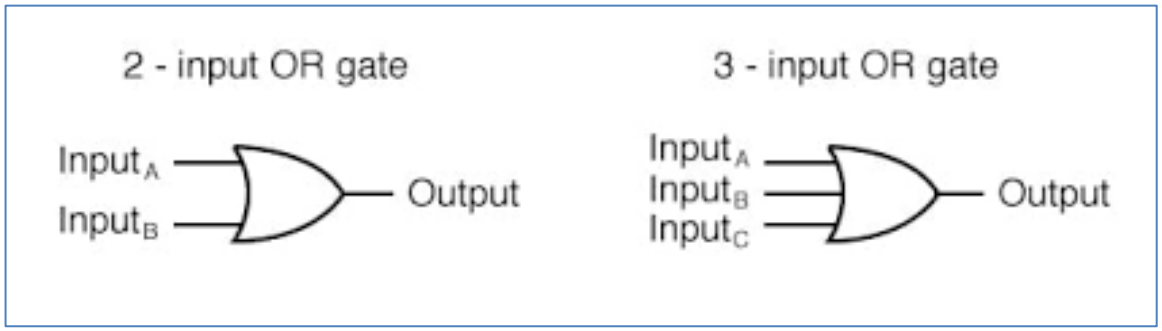
Electronic gates require a power supply.

Gate INPUTS are driven by voltages having two nominal values, e.g. 0V and 5V representing logic 0 and logic 1 respectively.

The OUTPUT of a gate provides two nominal values of voltage only, e.g. 0V and 5V representing logic 0 and logic 1 respectively. In general, there is only one output to a logic gate except in some special cases.

There is always a time delay between an input being applied and the output responding.





truth tables for 3 input logic gates.

Inputs			Outputs		
C	B	A	AND	OR	XOR
0	0	0	0	0	0
0	0	1	0	1	1
0	1	0	0	1	1
0	1	1	0	1	0
1	0	0	0	1	1
1	0	1	0	1	0
1	1	0	0	1	0
1	1	1	1	1	1

Procedure

For AND Gate

1. Provide a power supply for TESCA board by connecting the board cable to a socket switch of 220V AC.
2. Connect the input switches which are pins **A, B** on the bottom of the board to **A, B** input pins of **AND gate** respectively on the top middle of the TESCA board.
3. Connect the output pin of **AND gate** of the TESCA board to the **input pin L1 LED** Display on the middle of the board.
4. Make sure all your connections are correct, then turn on the power supply from the socket switch.
5. Turn **A, B** switches to position 1 then observe output of **AND Gate** on the **LED display L1**.
6. Record results on your handbook.

Repeat the procedure for other gates.

Discussion:

Write one page to explain what you have learned.