BRAC UNIVERSITY
School of Engineering and Computer Science
CSE-350: Digital Electronics and Pulse techniques

Experiment No: 3

Study of a TTL NAND gate with totem pole output

Objective

1. Building standard TTL-NAND Gate.
2. Measure the voltages and verify the circuit.

Equipments and component list

Equipments:

1. Osciloscope
2. Digital Trainer Board
3. Digital Multimeter
4. DC power supply

Component:

- NPN Transistor: C828 3pieces
- Diode 1N4003 1pieces
- Resistors

4K 1 pieces
1.5K 1 piece
1K 1 piece
100 1 piece

Procedure

1. Connect the circuit as shown in Fig: 4

2. Verify the TTL NAND gate.

3. Measure the $V_0, V_1, V_2, V_3, V_4, V_5, V_6$ for all possible input combination.

Input A	Input B	Input (VA)	Input (VB)	V_0	V_1	V_2	V_3	V_4	V_5	V_6
0	0									

0	1									
1	0									
1	1									

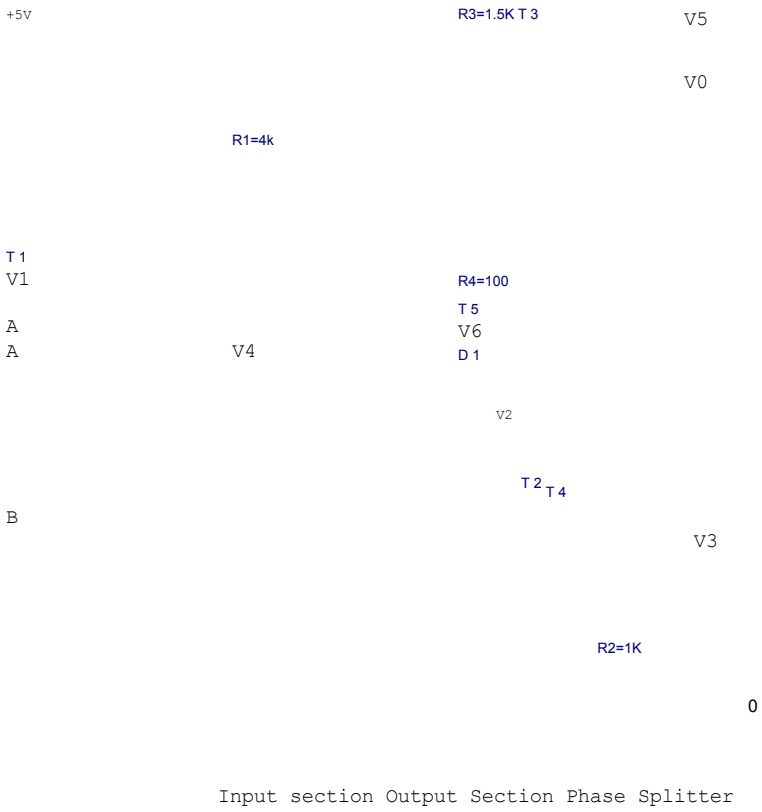

Figure 1: TTL NAND gate with Totem Pole output

Report

1. What is totem pole stage?
2. Why totem pole is used in place of passive pull up resistor?
3. What is the function of T3?
4. What may happen if diode D1 is not used in the circuit?
5. Can two totem pole gates be wire ANDed? Justify your answer.
6. What is the function of the phase splitter?

7. Design a TTL NOR gate with Totem Pole Output Stage.

Reference

Reference: Microelectronics: Digital and Analog Circuits and Systems by Jacob Millman