0.1 Exercise 1: Design and Implementation of NOT Gates Using Transistors

High-Level and Low-Level Input Voltages

The high-level input voltage (V_{IH}) es the minimum input voltage that is considered as high, while the low-level input voltage (V_{IL}) is the maximum input voltage that is considered as low.

High-Level and Low-Level Output Voltages

The high-level output voltage (V_{OH}) is the minimum output voltage that the circuit provides as a high, while the low-level output voltage (V_{OL}) is the maximum output voltage that the circuit provides as a low.

Noise Margin

The high noise margin (NM_H) is the gap between the high-level input voltage and the high-level output voltage, while the low noise margin (NM_L) is the gap between the low-level output voltage and the low-level input voltage.

$$NM_H = V_{OH} - V_{IH}$$

$$NM_L = V_{IL} - V_{IH}$$

Propagation Delays

Transition Times

Maximum Output Current

0.1.1 Using a BJT NPN 337 Transistor

0.1.2 Using a BJT PNP 327 Transistor