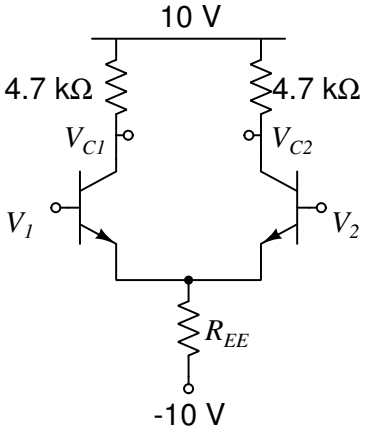
Indian Institute of Technology, Delhi
ELL304 Analog Circuits
Laboratory Exercise 5, 12 October 2015

Aim: Characterization of a BJT differential amplifier.



Steps:

1. Determine R_{EE} such that you obtain a quiescent bias current of 1 mA through each BJT and V_{CE} is 5 V for each BJT.
2. Apply $V_1 = V_2 = 0$ and measure the DC voltages V_{C1}, V_{C2}. What should they have been? Explain.
3. Measure the differential output when $V_1 = 100$ mV and $V_2 = 0$.
4. Experimentally measure the differential gain.
5. Measure the common mode gain.
6. Measure CMRR.
7. If observed CMRR is low, then list and explain design changes that can be made to improve CMRR.

Definitions:

1. Differential gain, $A_d = \dfrac{V_{C1} - V_{C2}}{V_1 - V_2}$.
2. Common mode gain, $A_{CM} = 2\dfrac{V_{C1} - V_{C2}}{V_1 + V_2}$.