UNIVERSITY OF CALIFORNIA AT BERKELEY
College of Engineering
Department of Electrical Engineering and Computer Sciences

EE105 Lab Experiments

Report 6: Biasing Circuitry

Name:

Lab Section:

1 Lab Questions

3.1.3 What is R_C when $V_{OUT} = 650$ mV?

$R_C =$

3.1.4 Roughly sketch I_C vs. V_{OUT} for the transistor and for the resistor, showing the fixed point solution for V_{OUT}. How would we adjust the resistor to increase V_{OUT}?

3.1.5 Will the voltage source become better or worse (better as defined by being closer to an ideal source) as the resistor decreases? Why?

3.1.6 Find the output impedance of the voltage source.

$R_{out} =$

3.1.7 Now, suppose you want to make your voltage source output 1.3 V. Clearly, putting 1.3 V on V_{BE} of the diode connected BJT is not a good idea (please, don't even try). Draw a circuit topology to achieve this voltage without requiring a BJT to have an extremely high V_{BE}.

3.2.2 Short circuit current:

I_{OUT} =

3.2.3 Find R_{out} in terms of the small-signal characteristics.

Theoretical R_{out} =

3.2.4 What happens to the output impedance as V_{OUT} nears 5 V?

3.2.5 Output impedance at $V_{OUT} = 2.5$ V

Measured R_{out} =

3.2.6–8 Transistors in parallel with $V_{OUT} = 2.5$ V:

I_{OUT} =

R_{out} =

Explain the effect of the second transistor on the output impedance.

3.3.2–6 Properties of the CE amp with current mirror:

V_{IN} =

A_v =

I_{C2} =

I_{C3} =

R_{in} =

R_{out} =

3.3.7 How do the impedances and gain compare with a common emitter biased with a resistor instead?

3.3.8 Explain this effect using what you know about BJT temperature effects. How may this be an advantage of BJT biasing over resistive biasing?