

## 6.012

## Microelectronic Devices and Circuits

### Tutorial #10

#### Problem 1 – Common Collector Stage

- You are given a voltage buffer that is based on the common collector stage shown in the figure below. It uses a current supply as shown and the signal source is a voltage.

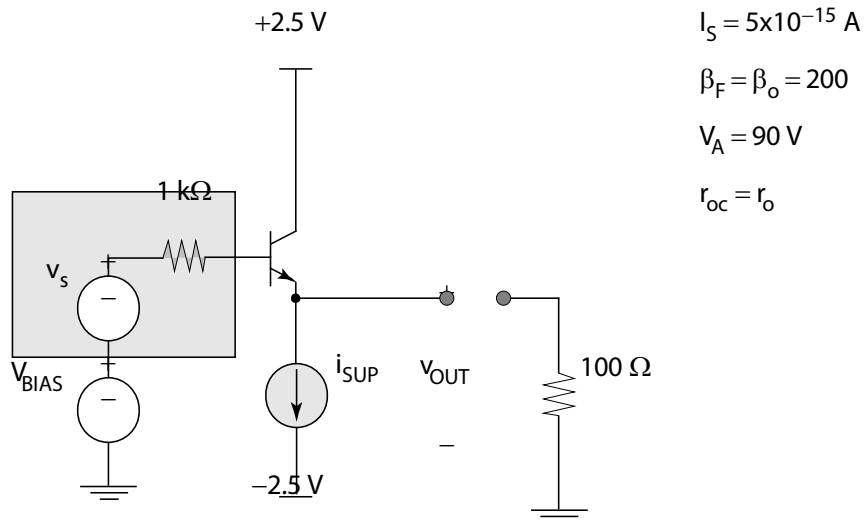


Figure T10-1-1

- Find the value of  $V_{BIAS}$  so that  $V_{OUT} = 0 \text{ V}$  when  $I_{SUP} = 500 \mu\text{A}$
- Calculate the two port parameter  $R_{in}$ ,  $R_{out}$  and  $A_{vo}$  when analyzed as a voltage amplifier.
- Calculate the overall voltage gain,  $A_v = v_{out}/v_s$  when the output is loaded as shown.

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