

ECE 321 - Homework #5

DC Analysis of Transistor Amplifiers, 2-Ports, CE Amplifiers. Due Monday, May 2nd

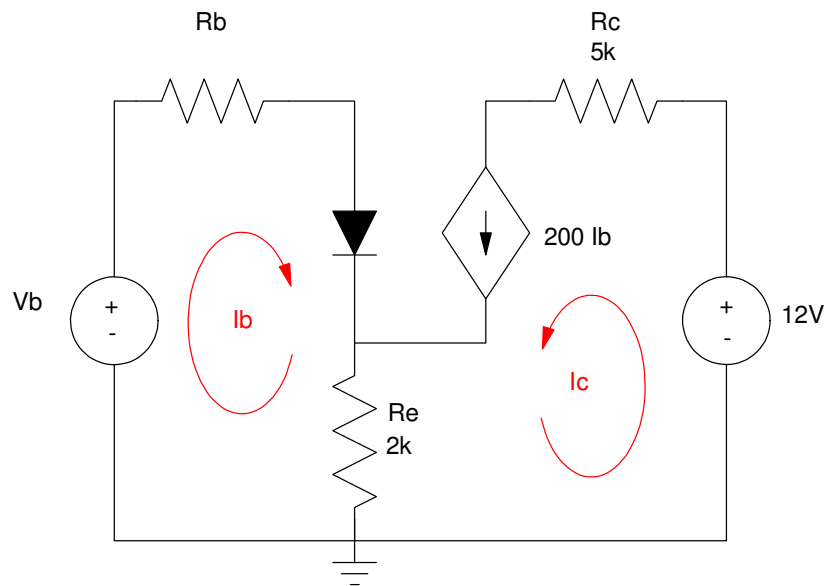
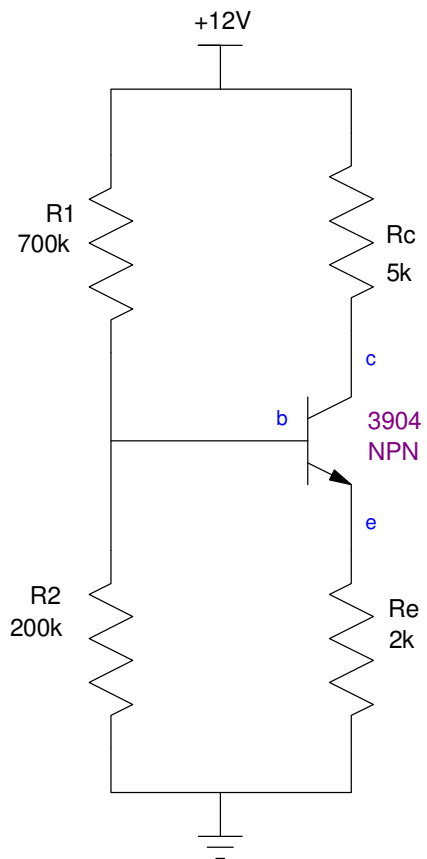
Please make the subject "ECE 321 HW#4" if submitting homework electronically to Jacob_Glower@yahoo.com (or on blackboard)

1) Determine the Q-point for the following transistor circuit. Assume C's are large and assume 3904 transistors:

- $V_{be} = 0.7V$
- $\beta = 200$

2) Modify this circuit so that

- The Q-point is stabilized for variations in β , and
- The Q-point is $V_{ce} = 5.0V$



Problem #1 and #2

3) Draw the small-signal model for the circuit of problem #2 connected as a common emitter amplifier (below). From this, determine the 2-port model

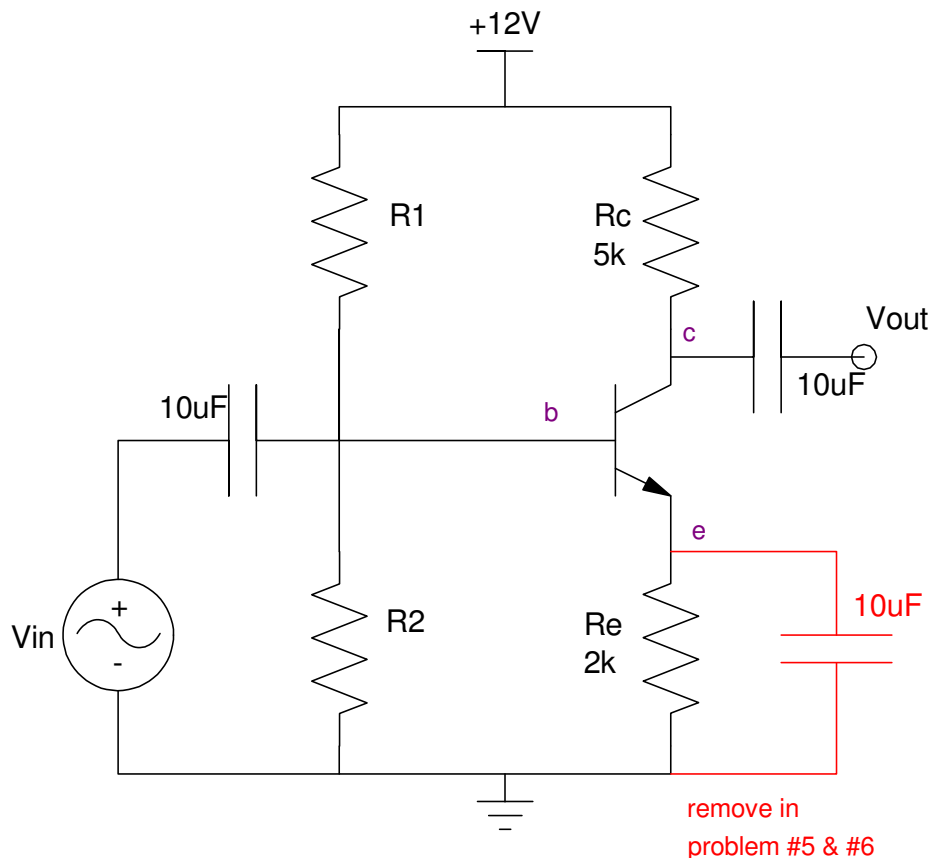
4) Simulate this circuit in CircuitLab. Verify each of the 2-port parameters at 1kHz

- R_{in}
- R_{out}
- A_o

5) Remove C_e . Now draw the small-signal model for the circuit of problem #2. From this, determine the 2-port model for the Common Emitter amplifier

6) Simulate this circuit in CircuitLab. Verify each of the 2-port parameters at 1kHz

- R_{in}
- R_{out}
- A_o



Problem 3 to 6. Use R_1 and R_2 from problem #2 (so that $V_{ce} = 5V$)