

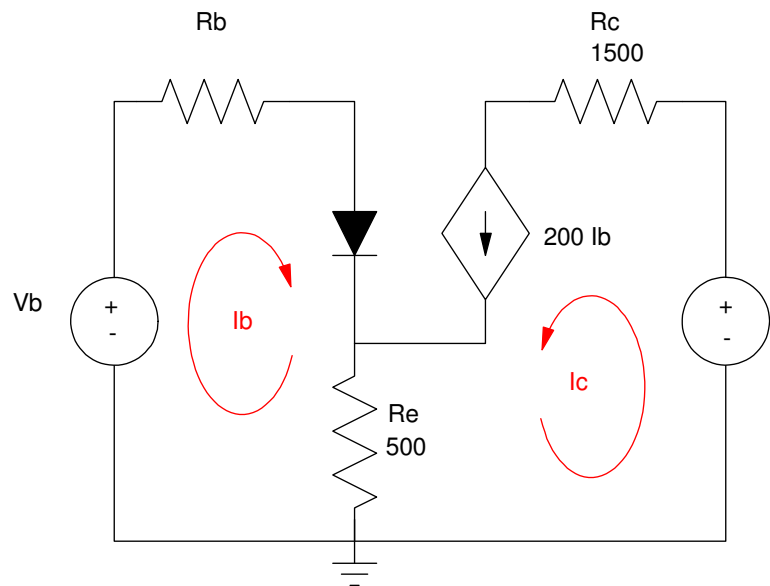
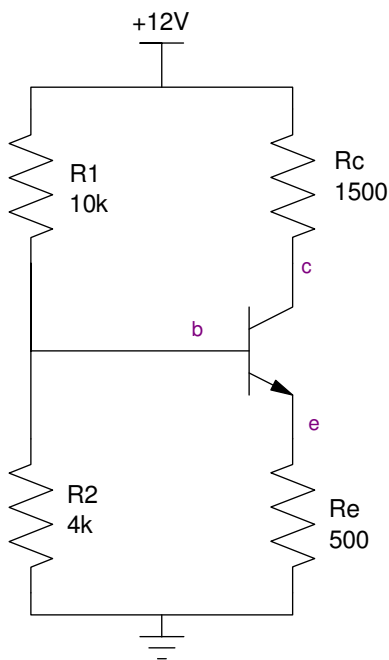
ECE 321 - Quiz #3 - Name _____

CE Amplifiers & 2-Port Models. Open-Book, Open Notes. Calculators and Matlab permitted.

1) Determine the Thevenin equivalent for R1 and R2 and Q-point for the following transistor circuit. Assume ideal 3904 transistors

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

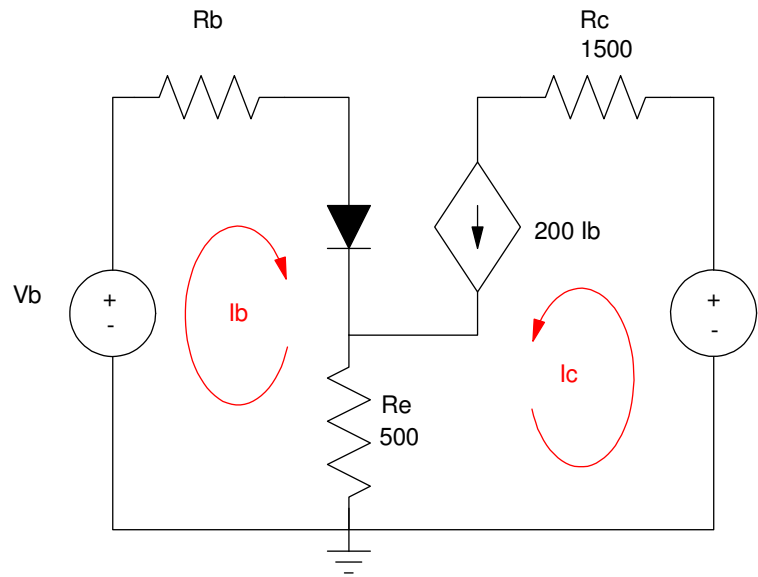
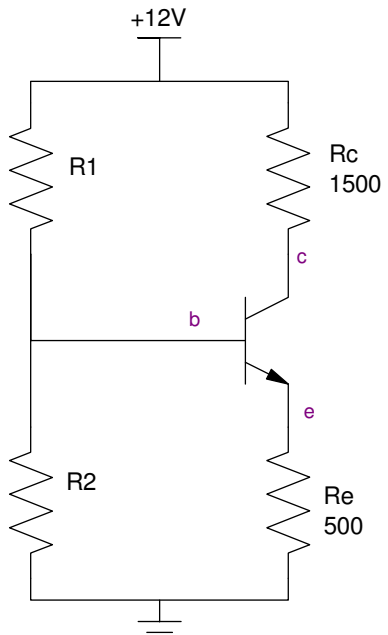
| Vb (Vth) | Rb (Rth) | Vce | Ic |
|----------|----------|-----|----|
| | | | |



2) Determine R1 and R2 as well as Vb and Rb so that

- The Q-point is stabilized for variations in β (meaning $(1 + \beta)R_e \gg R_b$), and
- $V_{ce} = 6.00V$

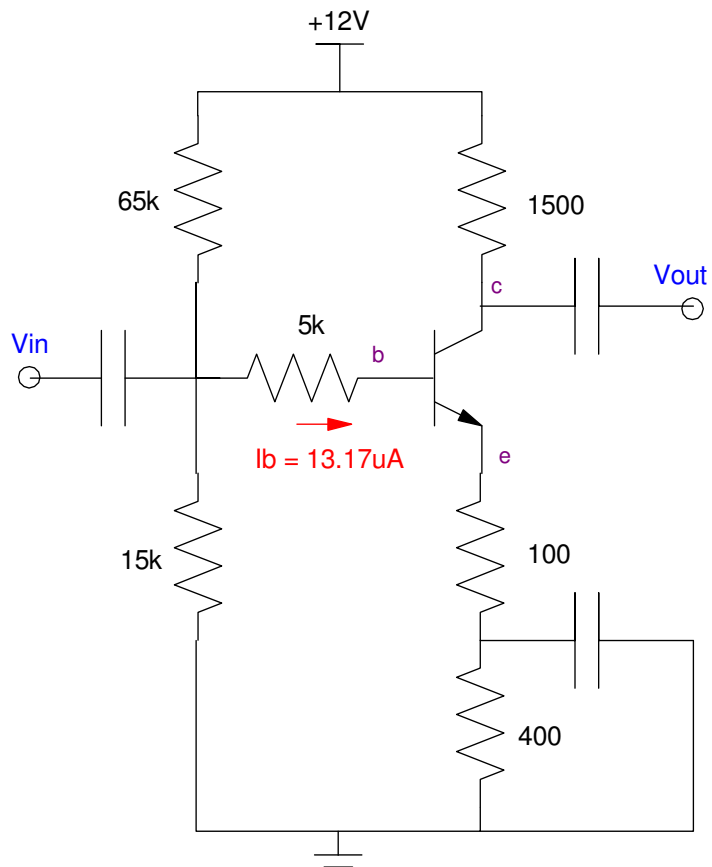
| R1 | R2 | Vb (Vth) | Rb (Rth) |
|----|----|----------|----------|
| | | | |



3) Draw the small-signal model for the following amplifier. Assume

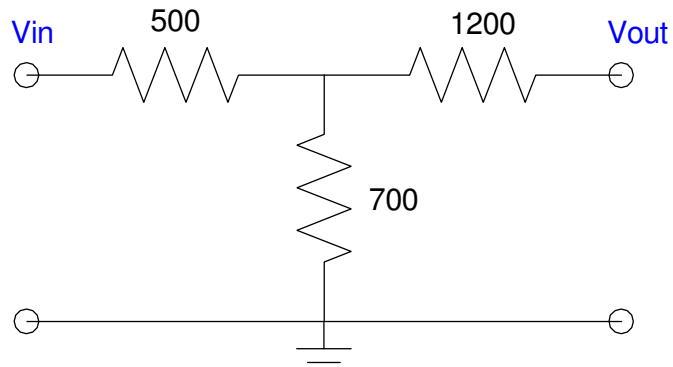
- $\beta = 200$
- $I_b(DC) = 13.17\mu A$

note: you don't need to find the 2-port model. That's a later quiz problem.



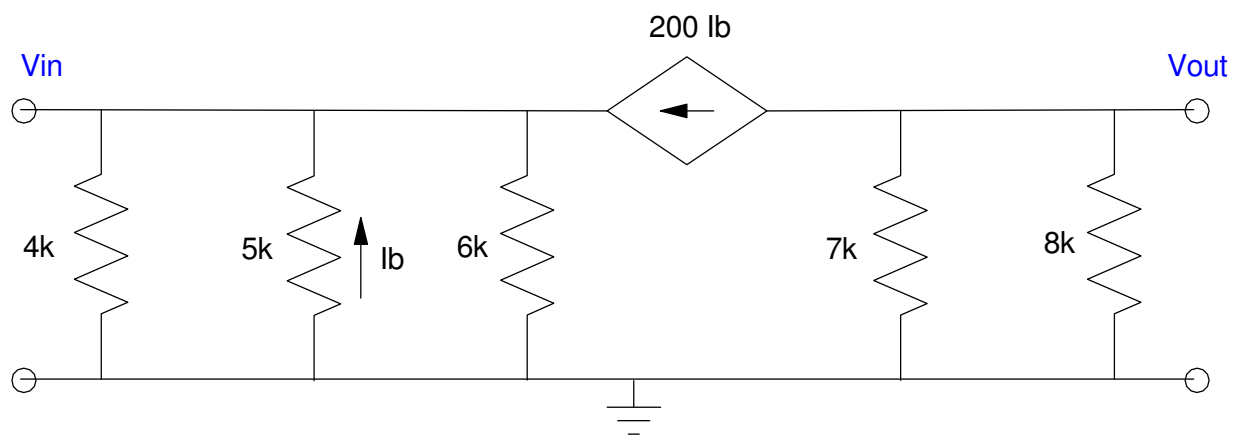
4) Determine the 2-port model for the following circuit

| R_{in} | A_i | R_{out} | A_o |
|----------|-------|-----------|-------|
| | | | |



5) Determine the 2-port model for the following circuit

| R_{in} | A_i | R_{out} | A_o |
|----------|-------|-----------|-------|
| | | | |



6) Determine the 2-port model for the following amplifier

| Rin | Ai | Rout | Ao |
|-----|----|------|----|
| | | | |

