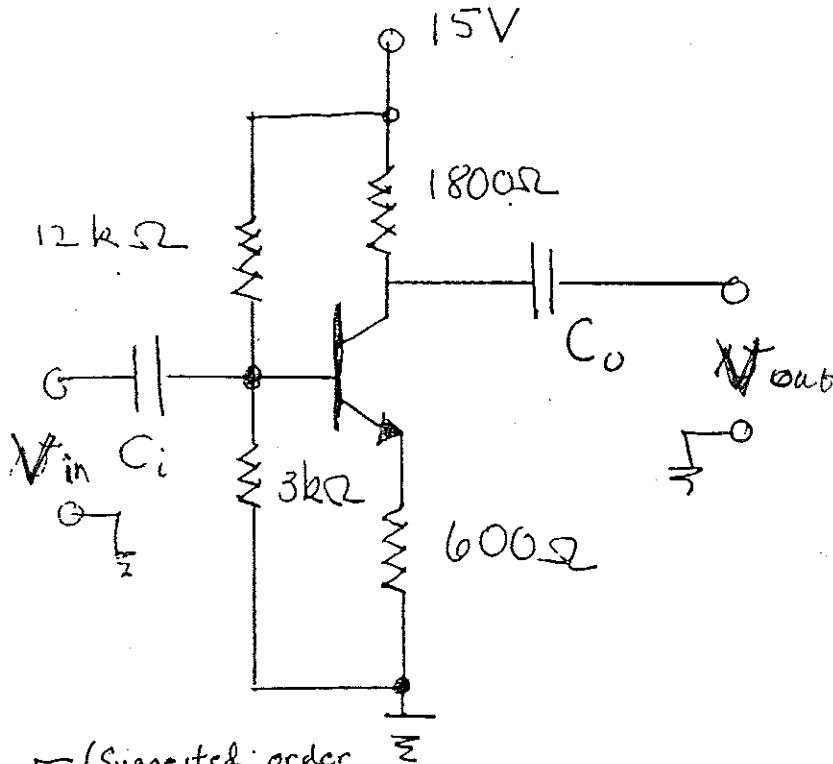1. For the circuit shown the transistor used has $\beta = 200$ and is made of silicon. Assuming the capacitors offer negligible impedance at the signal frequencies calculate the requested quantities.
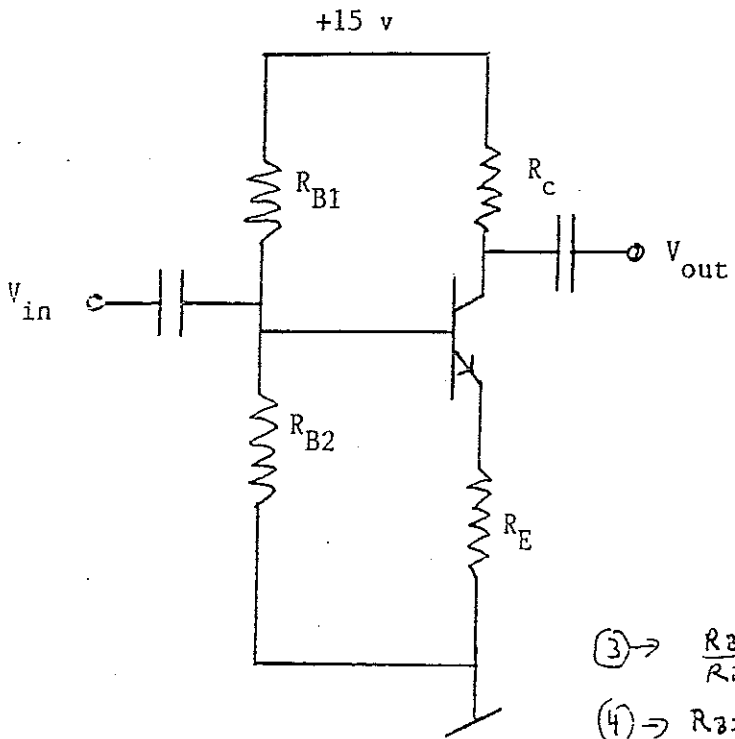

(Suggested order of approach)

③ I_E = _____ mA

④ I_C = _____ mA

⑥ I_B = _____ mA

⑤ V_C = _____ V

② V_E = _____ V

① V_B = _____ V

⑦ r_{tr} = _____ Ω

⑧ $A_v = v_o/v_i$ = _____

⑨ R_i = _____ Ω

⑩ R_o = _____ Ω

⓪   The sign of the power supply = _____

2. For the circuit shown, supply approximate values for the indicated components.
The silicon transistor has a minimum β of 80. The desired characteristics are:

② a) Gain = -10

① b) Output impedance = 10 K

③ c) Output voltage swing = ± 5 V minimum

④ d) Input impedance = maximum consistent with stability against variation in transistor parameters ($80 < \beta < \infty$, in this case).
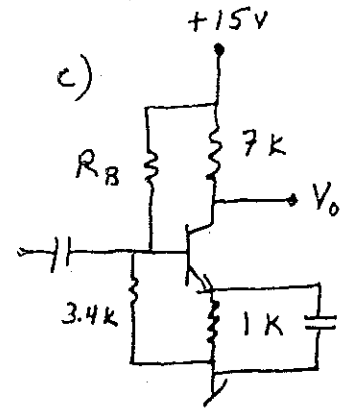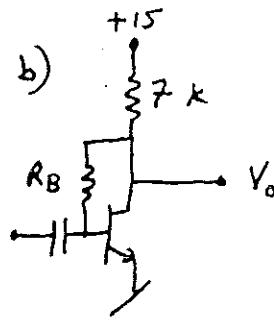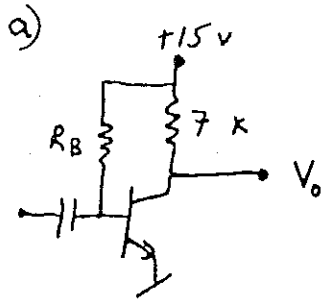

③→ $\dfrac{R_{B2}}{R_{B1}}$

④→ $R_{B2} // R_{B1}$

⑤ input impedance = _____

①
②

R_c = _____

R_E = _____

R_{B1} = _____

R_{B2} = _____

3. a)   b)   c)

For each of the biasing schemes shown above, find the value for R_B which will give a quiescent output voltage of about 8 volts at V_o if the transistor has a β of 50. You may assume that $V_{BE} \equiv 0.7$ volts.

If you build the circuits using the values of R_B calculated above, but the transistor actually has β = 200, what will be the quiescent operating point for each circuit? (A range of 50-200 in β is reasonable for transistors of a given type when both manufacturing tolerances and temperature effects are taken into account.)