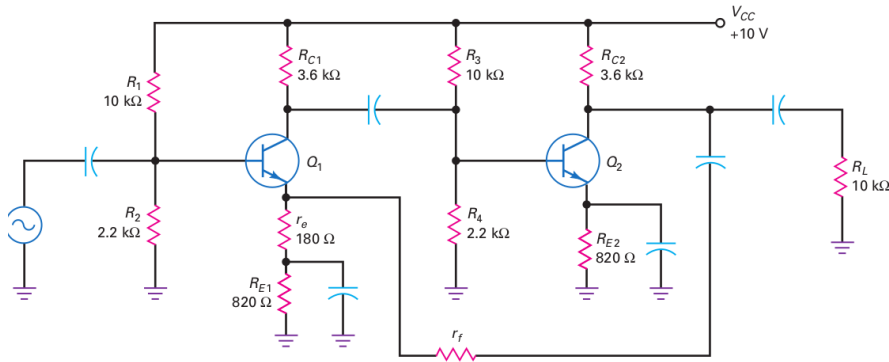## Amplifier Tutorial Sheet

Q1. The two stage CE amplifier in the figure has **feedback** from the second stage


to the first stage. Obtain an expression for the AC voltage v_e at the emitter of transistor Q_1, in terms of the external emitter resistance r_e, the feedback resistance r_f and $v - out$, the AC voltage across R_L. Such an amplifier has variable gain, if r_f is a variable resistor. What should be range of r_f, if the voltage gain of this amplifier is to be in the range $10 - 100$.

**Q2.** Calculate the input impedance of the CC amplifier in the above circuit and
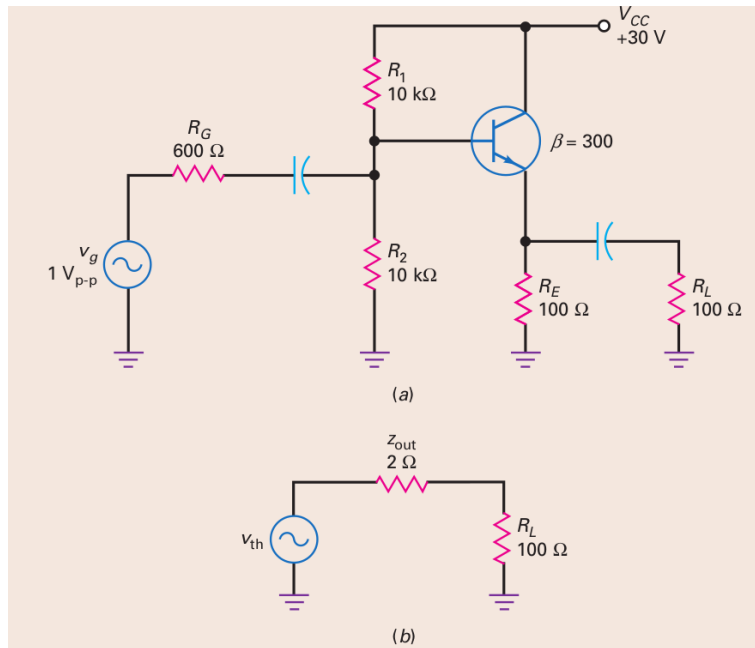
v_{out}/v_g, where v_{out} is the voltage across the 100Ω load resistor.

**Q3.** Calculat the input impedance, output impedance and the net voltage gain
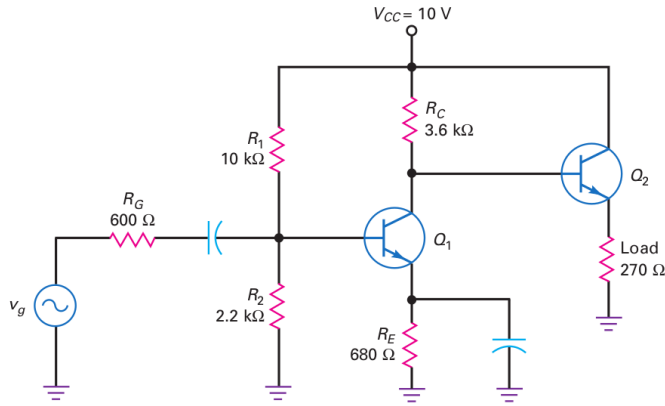
v_{out}/v_g for the CE-CC cascade amplifier. The output voltage v_{out} is the AC voltage across the load resistor 270Ω.

**Q4.** Calculate the input impedance, output impedance and the ratio v_{out}/v_g, of
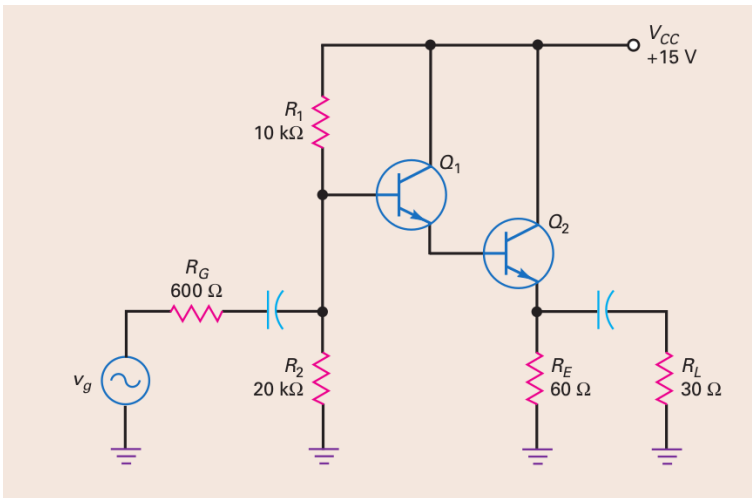
this CC amplifier with a Darlington pair, where v_{out} is the voltage across the load resistor R_L.

Q5. Analyse the large signal operation of the CC amplifier in the above figure and
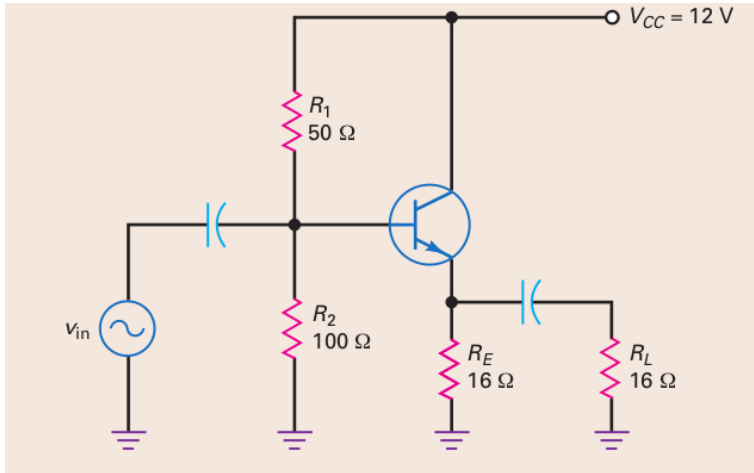
obtain its AC output compliance.

Q6. Calculate the quiescent collector current for the push-pull amplifier in the above
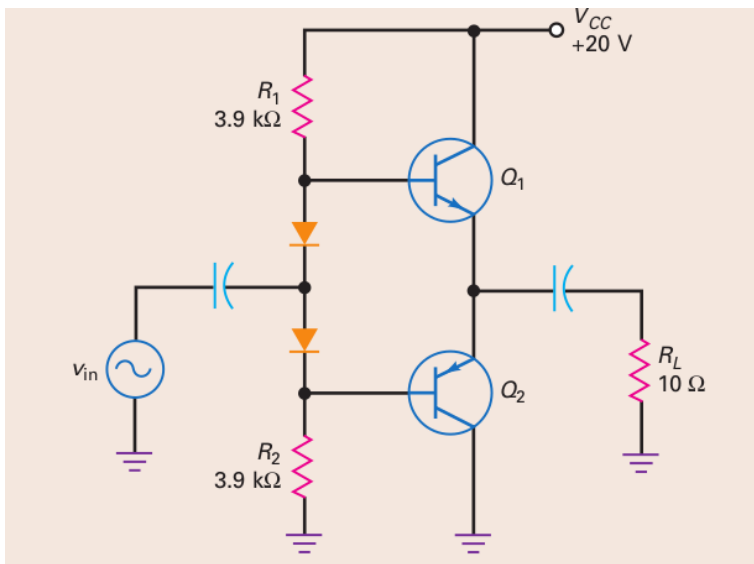
circuit. What is the DC power dissipation? What is the maximum AC output power possible?