ECE: Principles and Applications of Electronic Engineering
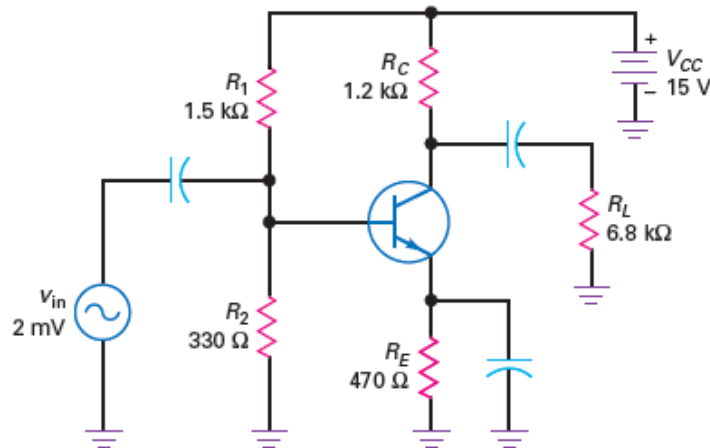### **Sheet 6**

Figure 1

1. If we want small-signal operation in Fig. 1, what is the maximum allowable ac emitter current?
2. The emitter resistor in Fig. 1 is doubled. If we want small-signal operation in Fig. 1 what is the maximum allowable ac emitter current?
3. What is the ac resistance of the emitter diode in Fig. 1?
4. If the emitter resistance in Fig. 1 is doubled, what is the ac resistance of the emitter diode?
5. What is the input impedance of the base in Fig. 1 if $\beta = 200$?
6. If the emitter resistance is doubled in Fig. 1, what is the input impedance of the base with $\beta = 200$?
7. If the 1.2-kΩ resistance is changed to 680 Ω in Fig. 1, what is the input impedance of the base if $\beta = 200$?
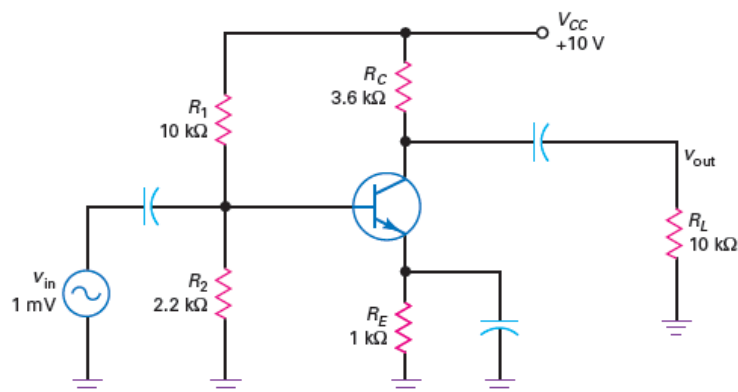8. Draw the ac-equivalent circuit for Fig. 1 with $\beta = 150$.

Figure 2

9. The ac source voltage in Fig. 2 doubles. What is the output voltage?
10. If the load resistance is reduced by one-half in Fig. 2, what is the voltage gain?
11. In Fig. 2, the supply voltage increased to +15 V. What is the output voltage?