

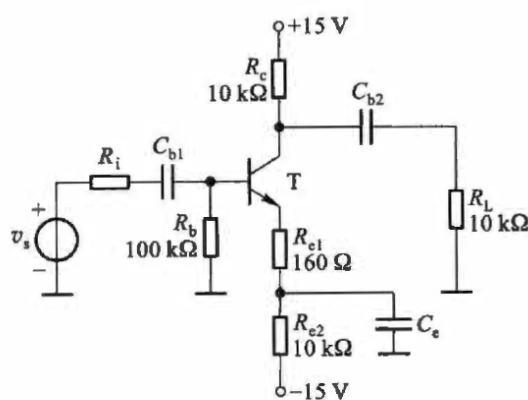
Homework for Chapter 5

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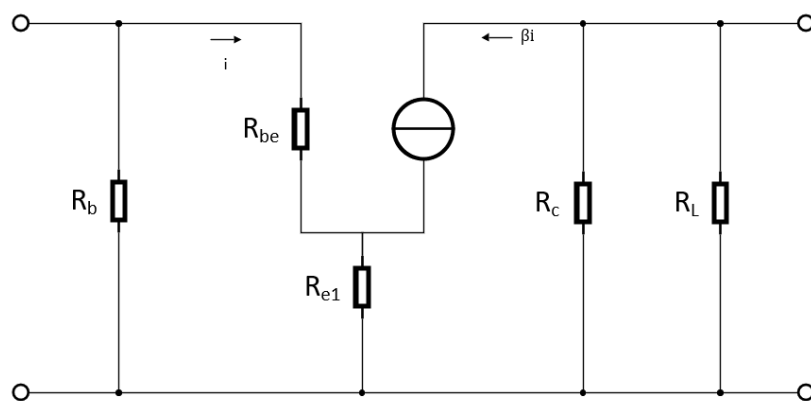
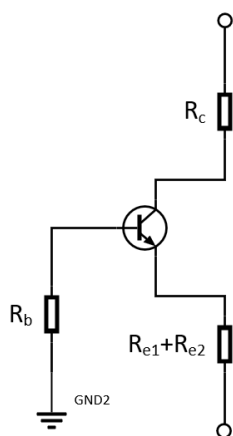
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5.4.6 电路如图题 5.4.6 所示, 设 BJT 的 $\beta=100$, $V_{BEQ}=0.7\text{ V}$ 。(1) 估算 Q 点;(2) 求电压增益 A_v 、输入电阻 R_i 和输出电阻 R_o 。



图题 5.4.6



Problem 1

$$I_{BQ} = \frac{(15 - 0.7)\text{ V}}{R_b + (1 + \beta)(R_{e1} + R_{e2})} = 12.7\text{ }\mu\text{A}$$

$$V_{CEQ} = 30 - \beta I_{BQ}(R_C + R_{e1} + R_{e2}) = 4.4\text{ V}$$

Problem 2

$$r_{be} = 200 \, \Omega + (1 + \beta) \frac{26 \, \text{mV}}{I_{EQ}(\text{mA})} = 2.27 \, \text{k}\Omega$$

$$A_v = -\frac{\beta (R_c \parallel R_L)}{r_{be} + (1 + \beta) R_{e1}} = -27.13$$

$$R_i = R_b \parallel [r_{be} + (1 + \beta) R_{e1}] = 15.56 \, \text{k}\Omega$$

$$R_o = R_L = 10 \, \text{k}\Omega$$