

2-1. 1. a b a a. 2. b. 3. a b. 4. a a b. 5. b

2-4. 1.  $V_x > V_y > V_z$   $V_{yx} = -0.3V$ .

$\therefore y$  为基极 b.  $x$  为发射极 e.  $z$  为集电极 c.

$V_e > V_b > V_c$  PNP 型.

2.  $V_y > V_x > V_z$   $V_{xz} = 0.3V$ .

$x$  为基极 b.  $z$  为发射极 e.  $y$  为集电极 c.

$V_e > V_b > V_c$  NPN 型.

2-7. a) 不能.  $+V_{CC} \rightarrow -V_{CC}$ . 电容反接.

b) 不能.  $R_B$  接到  $V_{CC}$ . 发射极接为旁路置.

c) 不能. ① b 极电压为  $V_{CC}$ . 饱和状态 ② 动态基极接地. 输入信号无法进入. 改为基极与  $V_{CC}$  间加电阻  $R_B$ .

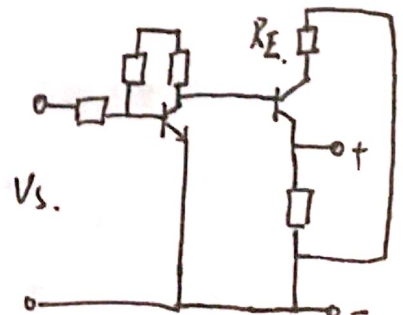
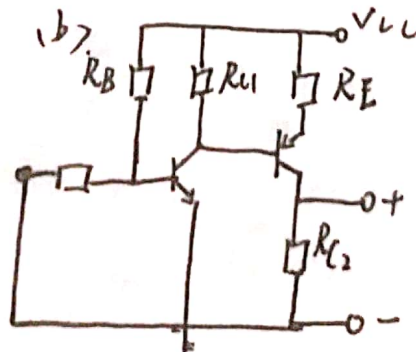
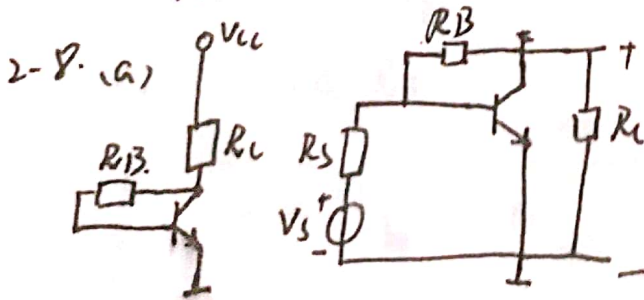
d) 不能. 基极无偏置电压. 将  $R_B$  接到基极与  $V_{CC}$  间.

e) 可以.

f) 可以.

g) 不能. 对于交流信号输出为 0. 在集电极加  $R_c$ .

h) 不能. 交流信号通过  $C_B, C_1$  短路. 输入无法进入.



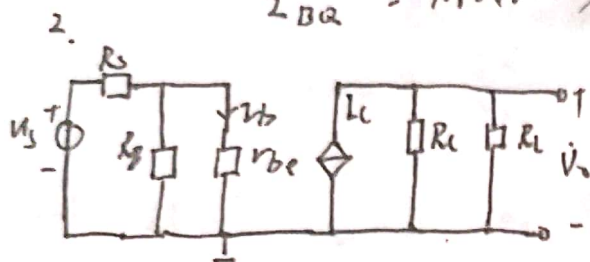
联系方式: \_\_\_\_\_



扫描全能王 创建

2-14. 1.  $I_{BQ} = \frac{I_{CQ}}{\beta} = 10 \mu A$

$R_B = \frac{V_{CC} - 0.7}{I_{BQ}} = 1.13 M\Omega$



$r_{be} = r_{bb'} + (1+\beta) \cdot \frac{26mV}{I_{EQ}} = 100 + \frac{26}{10} \times 10^3 = 2700 \Omega$

$A_u = \frac{\dot{V}_o}{\dot{V}_i} = \frac{-\beta R_L'}{r_{be}}$   $R_L' = R_L \parallel R_C$

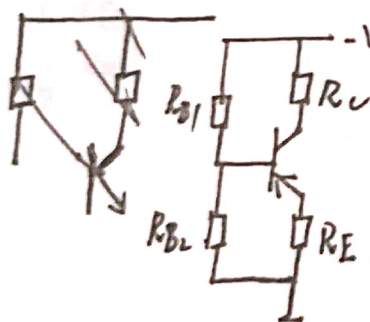
$A_u = -112$

$R_i = \frac{\dot{V}_i}{\dot{I}_i} = R_B \parallel r_{be} \approx 2.7 k\Omega$

$R_o = R_C = 16 k\Omega$

$A_{us} = \frac{\dot{V}_o}{\dot{V}_s} = \frac{R_i}{R_i + R_s} \cdot A_u = -83$

15. 1.



$V_B = \frac{-V_{CC}}{R_{B1} + R_{B2}} \cdot R_{B2} = -4V$

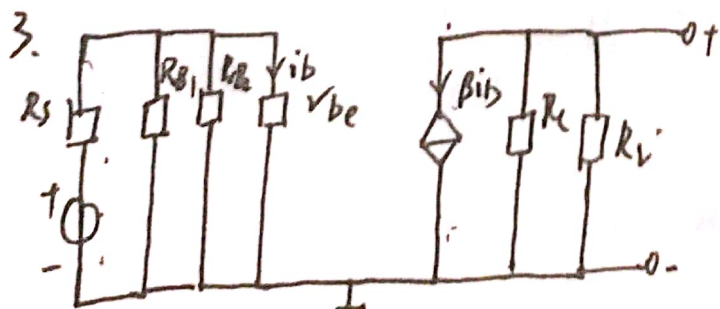
$I_{CQ} = \frac{V_B + 0.3}{R_E} = -1.85 mA$

$I_{BQ} = \frac{I_{CQ}}{\beta} = -2 \mu A$

$V_{CEQ} = -V_{CC} + I_{CQ}(R_C + R_E) = -6.75V$

2.  $I_{CQ} = \frac{-V_{CC} - V_{CEQ}}{R_C + R_E} = -2.4 \mu A$

$V_B \approx I_{CQ} \cdot R_E = -4.8V = \frac{R_{B2}}{R_{B1} + R_{B2}} \cdot (-V_{CC}) \therefore R_{B1} = 47 k\Omega$



$r_{be} = r_{bb'} + (1+\beta) \frac{26mV}{I_{EQ}} \approx 1.3 k\Omega$

$R_i = R_{B1} \parallel R_{B2} \parallel r_{be} \approx 1.2 k\Omega$

$A_{us} = \frac{\dot{V}_o}{\dot{V}_s} = - \frac{R_i}{R_i + R_s} \cdot \frac{\beta(R_C \parallel R_L)}{r_{be}} = -55$

$R_o = R_C = 3 k\Omega$



2-16 1. 由 2-15 可知.  $A_u = \frac{V_o}{V_i} = - \frac{\beta(R_c \parallel R_L)}{r_{be}}$

$R_i = R_{B1} \parallel R_{B2} \parallel r_{be}$   $r_{be} = r_{bb'} + (1+\beta) \frac{26mV}{I_{EQ}}$

$I_{EQ} \approx \frac{V_B - V_{BE}}{R_E}$

$\beta \uparrow$ .  $I_{EQ}$  不变.  $A_u$  不变.  $R_i$  增大.

2.  $R_E \uparrow$ .  $I_{EQ} \downarrow$ .  $A_u \downarrow$ .  $R_i$  增大.

2-17.  $V_B = \frac{V_{CC}}{R_{B1} + R_{B2}} R_{B2} = 2.12(V)$

$R_E = 0$ .  $I_E = \frac{V_B - 0.7}{R_{E1}} = 1.42(mA)$

$r_{be} = r_{bb'} + (1+\beta) \frac{26mV}{I_E} = 1.217(k\Omega)$

$R_i = \frac{V_i'}{I_i'} = R_{B1} \parallel R_{B2} \parallel (r_{be} + (1+\beta) R_E) = 1.63(k\Omega)$

$A_u = \frac{V_o}{V_i} = - \frac{\beta(R_c \parallel R_L)}{r_{be} + (1+\beta) R_E} = -174$

$R_o = R_c = 8.2(k\Omega)$

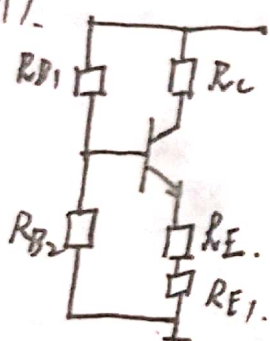
$R_E = 200$ .  $I_E = \frac{V_B - 0.7}{R_E + R_{E1}} = 1.18(mA)$

$r_{be} = r_{bb'} + (1+\beta) \frac{26mV}{I_E} = 1.4(k\Omega)$

$A_u = \frac{V_o}{V_i} = - \frac{\beta(R_c \parallel R_L)}{r_{be} + (1+\beta) R_E} = -15.5$

$R_i = \frac{V_i'}{I_i'} = 6.3(k\Omega)$   $R_o = R_c = 8.2(k\Omega)$

$R_E \uparrow$   $|A_u| \downarrow$ .  $R_i \uparrow$   $R_o$  不变.





# 作业纸

课程名称: \_\_\_\_\_

第 \_\_\_\_\_ 页

班级: \_\_\_\_\_

教学班级: \_\_\_\_\_

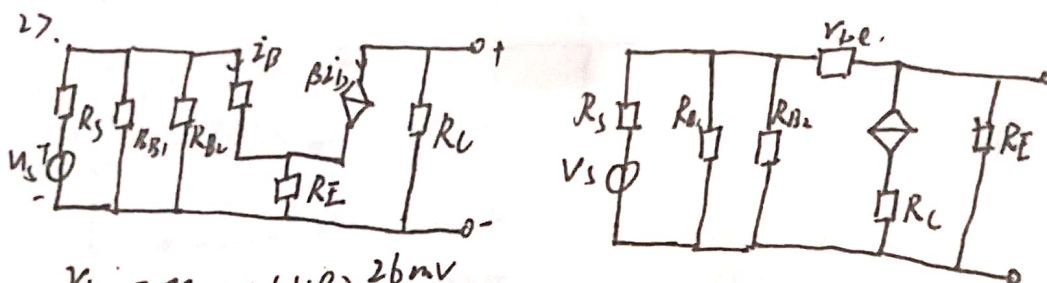
姓名: \_\_\_\_\_

学号: \_\_\_\_\_

2-18:  $V_B = \frac{V_{CC}}{R_{B1} + R_{B2}} \cdot R_{B2} = 4.3V$

$I_{EQ} = \frac{V_B - 0.7V}{R_E} = 1.8mA \approx I_{CQ}$

$V_{CEQ} = V_{CC} - I_{CQ}(R_C + R_E) = 2.8V$



$r_{be} = r_{bb'} + (1+\beta) \frac{26mV}{I_E} = 1.2k\Omega$

$R_i = \frac{V_i}{I_i} = R_{B1} \parallel R_{B2} \parallel [r_{be} + (1+\beta)R_E] = 8.2k\Omega$

$A_{us1} = \frac{V_{o1}}{V_s} = \frac{-\beta R_C}{r_{be} + (1+\beta)R_E} \cdot \frac{R_i}{R_i + R_s} = -0.79$

$A_{us2} = \frac{V_{o2}}{V_s} = \frac{(1+\beta)R_E}{r_{be} + (1+\beta)R_E} \cdot \frac{R_i}{R_i + R_s} = 0.797$

3-7  $R_{O1} = R_C = 2k\Omega$

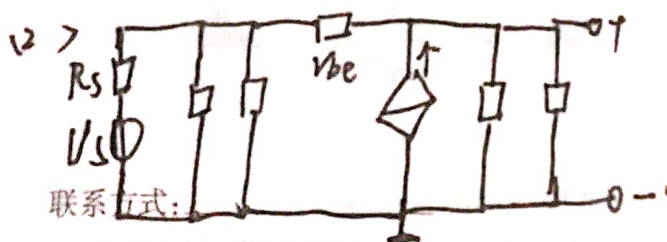
$R_{O2} = R_E \parallel \frac{r_{be} + R_s \parallel R_{B1} + R_{B2}}{1+\beta} = 33\Omega$

2-19:  $V_{BQ} = \frac{V_{CC}}{R_{B1} + R_{B2}} \cdot R_{B2} = 5V$

$I_{EQ} = \frac{V_{BQ} - 0.7V}{R_E} = 2.15mA$

$I_{CQ} = \frac{\beta}{1+\beta} I_{EQ} \approx 2.1mA$

$V_{CEQ} = V_{CC} - I_{CQ} \cdot R_E = 7.7V$



联系式:

$r_{be} = r_{bb'} + (1+\beta) \frac{26mV}{I_E} = 1.35k\Omega$

$A_u = \frac{V_o}{V_i} = \frac{I_{CQ} R_C}{I_b v_{be} + I_{CQ} R_C} = 0.987$

$R_i = R_{B1} \parallel R_{B2} \parallel [r_{be} + (1+\beta)R_E] = 2.1k\Omega$

$R_o = R_E \parallel \frac{r_{be} + R_s \parallel R_{B1} + R_{B2}}{1+\beta} = 23\Omega$

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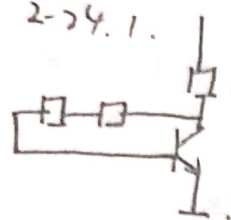
电话: 81382088



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3  
3.

2-24.1.

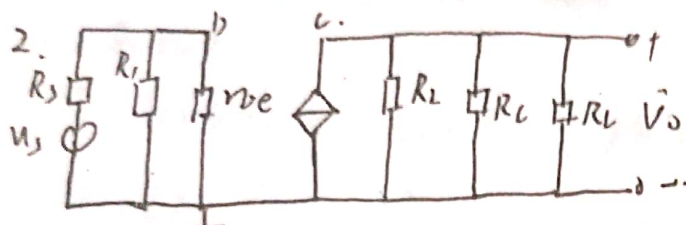


$$Z_{LQ} = \beta Z_{BQ}$$

$$Z_{RL} = Z_{BQ} + Z_{LQ}$$

$$\frac{V_{CC} - V_{CEQ}}{R_L} = Z_{BQ} + \beta Z_{BQ}$$

$$\therefore R_1 = \frac{R_L}{2} = R_2 = 62 \text{ k}\Omega$$



$$r_{be} \approx r_{bb'} + (1 + \beta) \frac{26 \text{ mV}}{I_E} = 1.3 \text{ k}\Omega$$

$$A_u = \frac{\dot{V}_o}{\dot{V}_i} = \frac{-\beta (R_L \parallel R_1 \parallel R_2)}{r_{be}} = -149$$

$$3. R_i = r_{be} \parallel R_1 = 1.3 \text{ k}\Omega$$

$$R_o = R_L \parallel R_2 = 7.3 \text{ k}\Omega$$

$$A_{us} = \frac{\dot{V}_o}{\dot{V}_s} = \frac{R_i}{R_i + R_s} A_u = -8.3$$

$$2-25-1? Z_{EQ} \approx Z_{LQ} = 1 \text{ m}\Omega. Z_{BQ} \frac{Z_{LQ}}{\beta} = 10 \text{ m}\Omega$$

$$V_{BQ} = \frac{R_{B1} V_{CC}}{R_{B1} + R_{B2}} = 3.5 \text{ V}$$

$$I_{EQ} = \frac{V_{BQ} - V_{BEQ}}{R_E} = 1 \text{ mA}$$

$$\therefore R_E = 2.8 \text{ k}\Omega$$

$$R_L = \frac{V_{CC} - (V_{BQ} - V_{BEQ}) - V_{CEQ}}{I_{LQ}} = 5.2 \text{ k}\Omega$$

$$I_1 = 0.1 \text{ mA} \quad Z_L (R_{D1} + R_{B2}) = V_{CC} \quad Z_1 R_{B1} = V_{B1}$$

$$R_{B1} = 35 \text{ k}\Omega$$

$$R_{B2} = 85 \text{ k}\Omega$$

$$2) A_u = \frac{-\beta R_L}{r_{be}} = -193$$

$$R_i = R_{B2} \parallel R_{B1} \parallel r_{be} = 2.4 \text{ k}\Omega$$

$$\text{联系方式: } R_o = R_L = 5.2 \text{ k}\Omega$$

