

3.3

a) $I_C \approx I_E = 1.13mA$

$$R_C = 5.93k\Omega$$

b) $I_C \approx I_E = 1mA, R_C = 3k\Omega$

3.5

$$\alpha=0.914$$

3.8

$$V_{BB} = 1.105V \sim 3.205V$$

3.10

饱和工作状态, $R_{E\min} = 0.89k\Omega$

3.11

(b) 放大工作状态 (c) 饱和工作状态

3.15

$$\begin{cases} I_{B1} = 0.003mA \\ I_{B2} = 0.042mA \end{cases}, \begin{cases} V_{CE1} = V_{C1} = 5.664V \\ V_{CE2} = V_{C2} - V_{E2} = 4.936V \end{cases}$$

3.16

$$f_a = 123.67MHz$$

3.18

$$C_{\pi} = 303pF, f_T = 100MHz, f_{\beta} = 1MHz$$

3.21

$$1) \quad I_E = 2.81mA \approx I_C, V_{CE} = 5 - 2.81 \times 1.1 = 1.91V$$

$$2) \quad h_{ie} = r_b + (1 + \beta)r_e = 200 + 181 \times 9.25 = 1874.25\Omega$$

(注: 题目中未给 r_b 的值, 这里取 $r_b = 200\Omega$, 若忽略 r_b 则 $h_{ie} \approx 1674.25\Omega$)

$$3) \quad R_i = 0.7k\Omega$$

$$R_o = R_C = 1k\Omega$$

$$A_{Vs} = -45.73$$

3.23

$$1) \quad \begin{cases} R_C = 11.3k\Omega \\ R_E = 16.6k\Omega \end{cases}$$

$$2) \quad A_V = -55.4, R_i = 14.6k\Omega, R_o = 11.3k\Omega$$

3.24

$$1) \quad I_E = 15.73mA \approx I_C, V_{CE} = 10.12V$$

$$2) \quad A_V = 0.986, A_{Vs} = 0.813, R_i = 4.36k\Omega, R_o = 6.2\Omega$$

3.29

$$1) \quad I_c = 0.495mA, V_{ce} = 1.195V$$

$$2) \quad A_V = 18.85, A_{Vs} = 9.37, R_i = 49.43\Omega, R_o = 100k\Omega$$

3.31

1) $A_v = -57.7, A_{v_s} = -35.2, R_o = R_C = 2k\Omega, R_i = 1.57k\Omega$

3.36

1) $R_B = 825k\Omega$

2) $A_v = 1.03 \times 10^4, A_{v_s} = 1.02 \times 10^4$

3) R_{E2} 上压降为 $V_{E2} = I_{E2}R_{E2} = 0.19V$ ，所以选择锗管，使其正向导通，
 $A_v = 1.88 \times 10^4, A_{v_s} = 1.86 \times 10^4$

3.37

$$A_{v_0} \approx 400, \omega_L = 200 \text{ rad/s}, \omega_h = \frac{1}{\sqrt{\frac{1}{\omega_{h1}^2} + \frac{1}{\omega_{h2}^2}}} = 8.9 \times 10^3 \text{ rad/s}$$

3.38

$$f_h = 4.67 \text{ kHz}, \text{主极点法: } f'_h = \frac{1}{\sqrt{\frac{1}{f_1^2} + \frac{1}{f_2^2}}} = 4.82 \times 10^3 \text{ rad/s}, \Delta f = f'_h - f_h = 0.15 \text{ kHz}$$

3.39

$$f_l = 10.2 \text{ Hz}, f_h = 49 \text{ kHz}$$