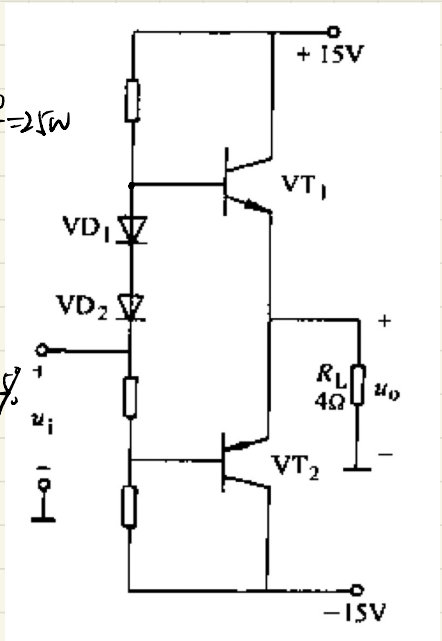
第五章 功率放大电路 06011908 1120193653

5.5. (1) $P_o = \frac{1}{2} U_{om} I_{om} = \frac{U_{om}^2}{2R_L} = \frac{(10V)^2}{2\times 4} = \frac{100}{4} = 25W$

$\eta = \frac{P_o}{P_{VCC}} = \frac{25}{2V_{CC}U_{om}/\pi R_L} = \frac{25\pi}{2\times 15\times 10} = \frac{\pi}{3\sqrt{2}} \approx 74.0\%$



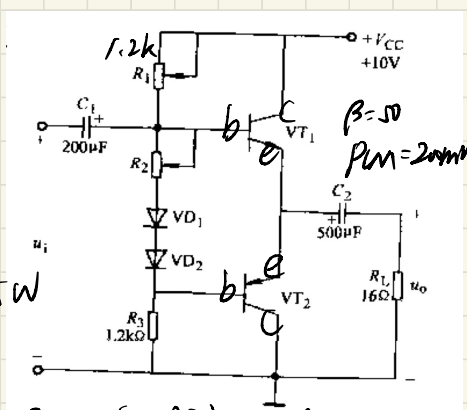
$P_T = \frac{1}{R_L}\left(\frac{V_{CC}U_{om}}{\pi} - \frac{U_{om}^2}{4}\right) = \frac{1}{4}\left(\frac{15\times 10\sqrt{2}}{\pi} - \frac{25}{2\pi\times 2}\right) = 4.38W$

(2) $I_{cm} > \frac{V_{CC}}{R_L} = \frac{15}{4} = 3.75A$

$P_{cm} > (P_T)_M = \frac{V_{CC}^2}{\pi^2 R_L} = \frac{225}{\pi^2\times 4} = 5.70W$

$U_{CEO(BR)} > 2V_{CC} = 30V$

5.10. (1) 此功率放大电路的可以被改造为



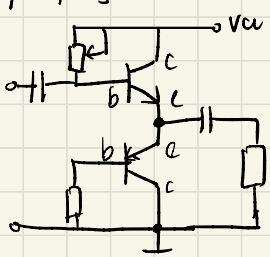
左使 $U_{EQ1} = U_{EQ2} = \frac{1}{2}(V_{CC}+0) = 5V$

∴ 电路静态时 $U_{C2} = 5V$

调节 R_1 使 $U_{CE1} = U_{EC2} = 5V$

2) $(P_o)_M = \frac{(U_{om}-U_{CES})^2}{2R_L} = \frac{(5-1)^2}{2\times 16} = 0.5W$

$\eta = \frac{\pi}{4}\frac{4}{5} = 0.2\pi = 62.83\%$

3) 

静态 $I_{CQ1} = I_{BQ2} = \beta I_{BQ2} = \frac{(5-0.7)}{1.2}\beta = 179mA$

$P_C = I_C U_{CE} = I_{CQ} \cdot U_{CE} = 5\times 179 \approx 895mW > 200mW$

不能选