1908 1120193582 张子凡 模电第三章

3.

U_{GS}/V	-1	-2	-2	-6
U_{DS}/V	3	4	2	10
工作区	b	a	b	c

4. a) 不能，$U_{GS}=0$，不能放大

b) 不能，d极无电阻，无输出

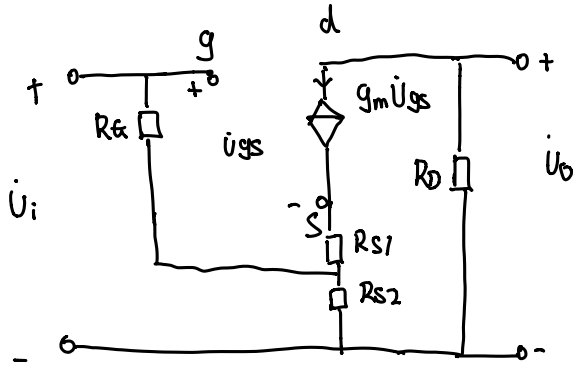
c) 可以，分压电路

d) 不能，自给偏压电路不能用于增强型场效应管

7. (1) $I_D = I_{DSS}\left(1-\frac{U_{GSQ}}{U_{GS(off)}}\right)^2 = 0.5mA$

$U_{GSQ} = U_{GQ} - U_{SQ} = -I_D R_{S1}$

$R_{S1} = 4k\Omega$



(2) $|U_{GS}| \geq |U_{GS(off)}|$

$U_{DS} \geq U_{GS} - U_{GS(off)} = 2V$

$V_{DD} - I_D(R_D + R_{S1} + R_{S2}) \geq 2V$

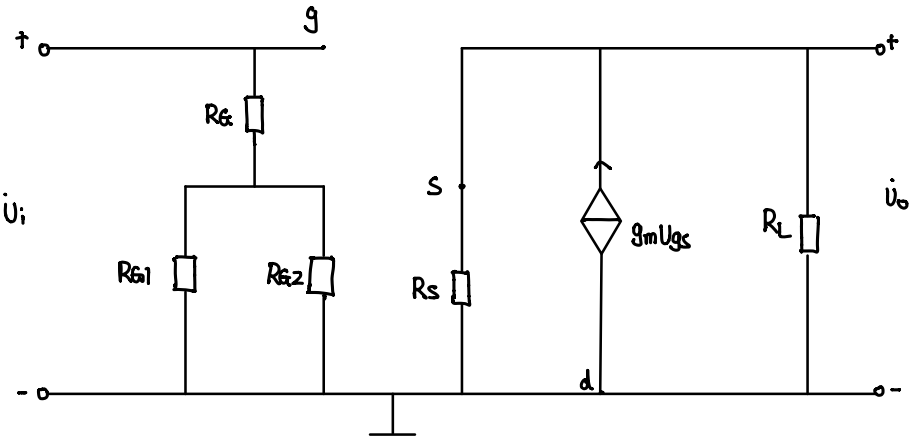
$R_{S2\,max} = 22k\Omega$

(3) $A_u = \frac{\dot{U}_o}{\dot{U}_i} = \frac{-g_m U_{gs} R_D}{U_{gs} + g_m U_{gs}(R_{S1}+R_{S2})}$

$g_m = -\frac{2I_{DSS}}{U_{GS(off)}}\left(1-\frac{U_{GSQ}}{U_{GS(off)}}\right) = 5\times10^{-4}$

$A_u = -0.36$

11.



$$A_u = \frac{\dot{U}_o}{\dot{U}_i} = \frac{g_m U_{gs}(R_S // R_L)}{U_{gs} + g_m U_{gs} R_S \frac{R_L}{R_S + R_L}} = 0.86$$

$$R_i = R_G + R_{G1} // R_{G2} = 2.075 M\Omega$$

$$R_o = R_L // \frac{1}{g_m} = 0.92 k\Omega$$