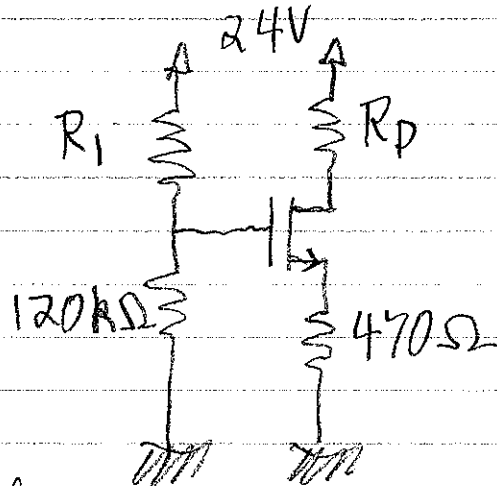


Problems MOSFET DC bias:

(1)



$$K = 48 \text{ mA/V}^2$$

$$V_t = 2.1 \text{ V}$$

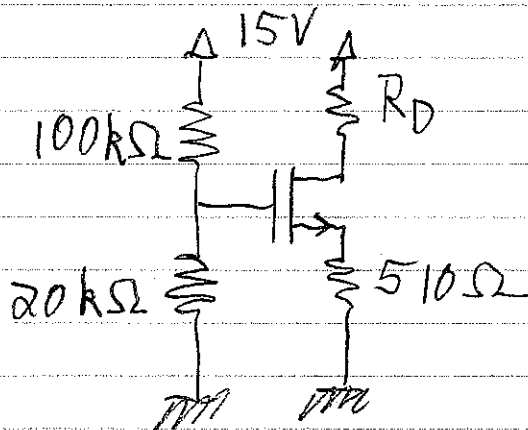
The MOSFET is biased in the active region and

$$V_{GS} = 2.61 \text{ V}$$

$$V_{DS} = 5.67 \text{ V}$$

Find I_D , R_D , R_1 .

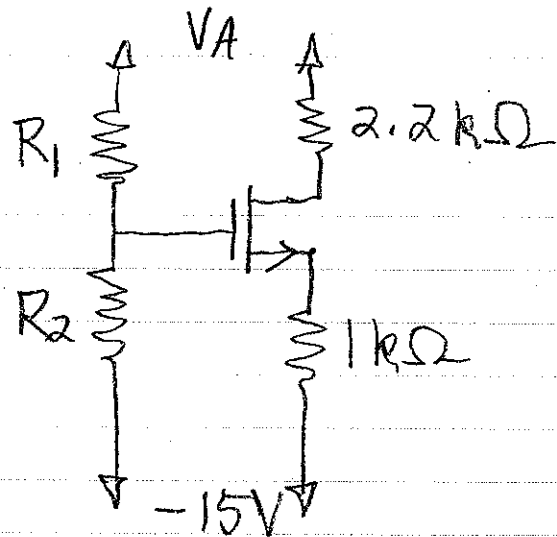
(2)



$$V_t = 1.5 \text{ V}$$

$V_D = 7.435 \text{ V}$, $V_S = 0.7563 \text{ V}$. Find K , I_D , R_D and V_{GS} .

(3)



$$K = 48 \text{ mA/V}^2$$

$$V_t = 2.1 \text{ V}$$

The MOSFET is biased in the active region and

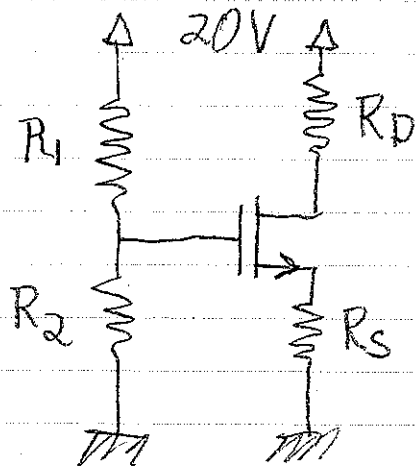
$$I_D = 5.736 \text{ mA}$$

$$V_{DS} = 11.64 \text{ V}$$

$$R_1 \parallel R_2 = 54.55 \text{ k}\Omega$$

Find V_A , R_1 , R_2 and V_{GS} .

(4)



$$K = 48 \text{ mA/V}^2$$

$$V_t = 2.1 \text{ V}$$

$V_G = 5.55 \text{ V}$, $R_1 \parallel R_2 = 10.83 \text{ k}\Omega$, $V_{GS} = 2.482 \text{ V}$,
 $V_{DS} = 6.446 \text{ V}$. Find R_1 , R_2 , R_D , R_S and I_D .

Answers:

(1) $I_D = 12.47 \text{ mA}$, $R_D = 1 \text{ k}\Omega$, $R_1 = 220 \text{ k}\Omega$.

(2) $K = 25 \text{ mA/V}^2$, $I_D = 1.483 \text{ mA}$, $R_D = 5.1 \text{ k}\Omega$,
 $V_{GS} = 1.744 \text{ V}$.

(3) $V_{GS} = 2.446 \text{ V}$, $V_A = +15 \text{ V}$, $R_1 = 200 \text{ k}\Omega$,
 $R_2 = 75 \text{ k}\Omega$

(4) $R_1 = 39 \text{ k}\Omega$, $R_2 = 15 \text{ k}\Omega$, $R_D = 1.5 \text{ k}\Omega$,
 $R_S = 440 \Omega$, $I_D = 6.986 \text{ mA}$

