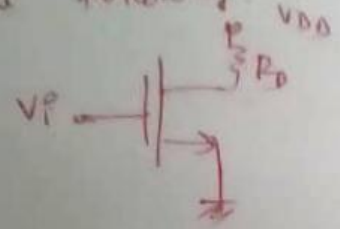
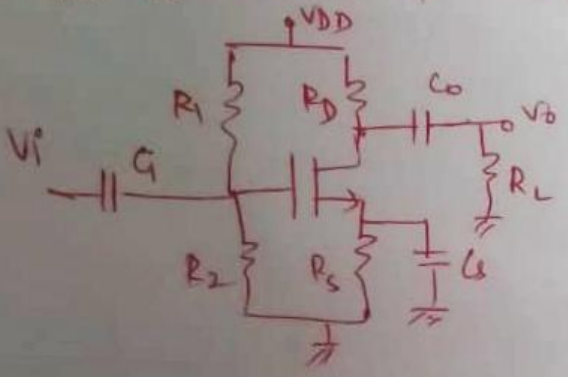
9 For the class A power amplifier shown below, do the following



$V_{DD} = 10V$, $R_D = 10k\Omega$, $K_n = 0.5 mA/V^2$, $V_T = 1V$, $\lambda = 0$. Assume the output voltage is limited to the range between the transition point and V_{DD} to minimize the non linear distortion.

Calculate the power conversion efficiency

10. For the class A power amplifier shown below,



a) Derive the power conversion efficiency

b) $V_{DD} = 10V$, $R_1 = 100k\Omega$, $R_2 = 50k\Omega$, $R_D = 5k\Omega$, $R_S = 1k\Omega$, $V_T = 1V$, $K_n = 0.5 mA/V^2$, calculate I_{DQ}, V_{DSQ}.

c) Due to the input signal, the output drain current goes between 500 mA and 50 mA. The V_{DS} swings between 10V and 1V. Determine the conversion efficiency

11. For class B power MOSFET amp, derive the power efficiency and max power efficiency.

12. Compare the characteristics of class A and class B power amplifier.

B. Consider the class AB power MOSFET, determine the required biasing if $V_{DD} = 20V$ and $R_L = 10\,\Omega$, the transistors are matched and the parameters are $k_n = 0.5\ mA/V^2$ and $V_T = 1V$, the quiescent drain current is 20% of the load current when $v_o = 8V$.