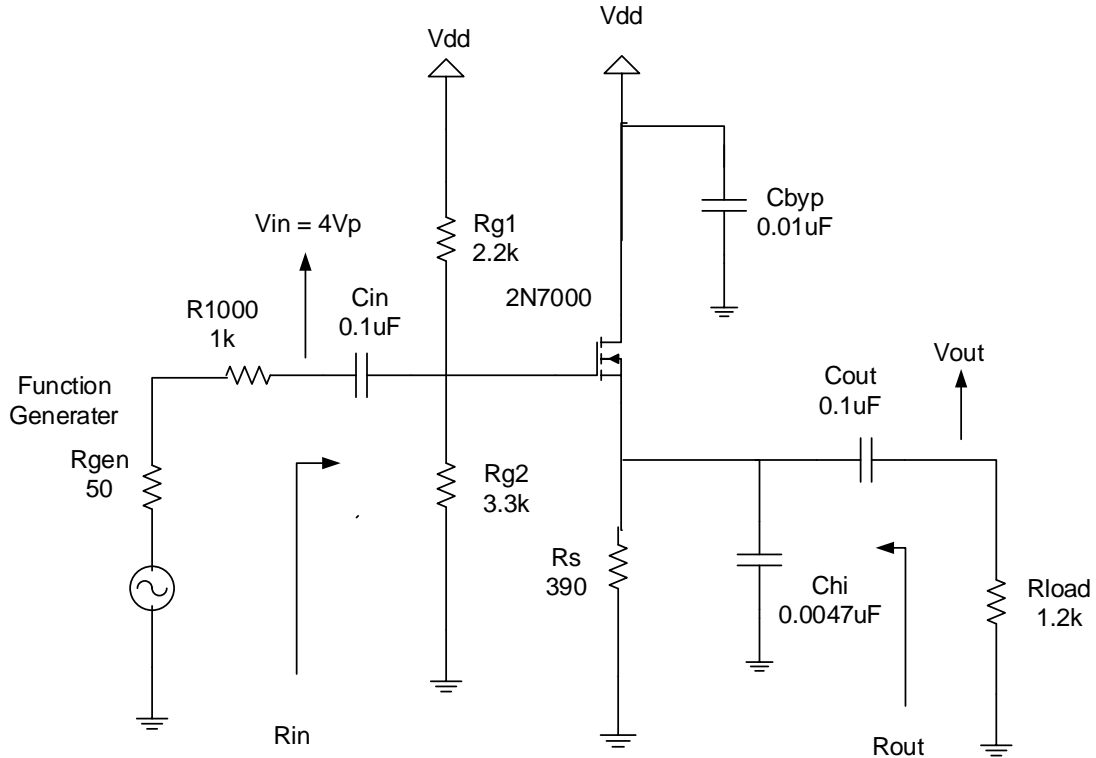


Practice Exam ECE3274 Time = 1 Hour 20 Minutes Closed book and notes

Part 1: (50 points)

Remember C_{BYP} is not included in your circuit analysis.



gm=123mS for AC calculation **ro= 5.33KΩ**. **V_{GS}= 2.5Vdc** for bias calculation.

(10 points) Draw **bias** model and **(10 points)** Draw the **small signal** model.

$$A_v = \frac{V_{out}}{V_{in}} = \frac{g_m (R_S \parallel R_L \parallel r_o)}{1 + g_m (R_S \parallel R_L \parallel r_o)}$$

Given Vdd= 15Vdc, Vin = 4.0Vp must find Vgen calculated.

(2 points each total 30 points)

Calculate before you build the circuit. **Must show all work, include units.**

Rin= _____ Rout= _____

V_G= _____ V_S= _____

V_D= _____ I_D= _____

Vout= _____

Iin= _____ I_{LOAD}= _____

A_v=Vout/Vin _____ A_i= I_{LOAD}/Iin _____

Vgen= _____ calculated

F_{cin}= _____ F_{Cout}= _____

F_L= _____

Part 2: measurement phase. (50 Points)

Build and Measure the circuit of part 1.

Show all work and include units for values.

Q-point: (12 points)

$V_g =$ _____ $V_s =$ _____ $V_d =$ _____
 $I_d =$ _____ $V_{gs} =$ _____ $V_{ds} =$ _____

Frequency response: (6 points)

Save a plot of frequency response with $V_{gen} = 4V_p$ from 10 Hz to 1 MHz, and find the low frequency cutoff, high frequency cutoff, and bandwidth from the plots.

$F_L =$ _____ $F_H =$ _____ $BW =$ _____

(10 points) Label and print the plot. Include the plot with the exam.

Measure the voltage gain, current gain, and impedances at the **midband frequency**,

show all calculations. $R_{in} = V_{in}/I_{in}$ $R_{out} = (V_{oc} - V_{out})/I_{load}$

(2 points each Total 22 points)

$V_{gen} = 4V_p$ Frequency of Source = _____ Hz
 $V_{in} =$ _____ $V_{R1000} =$ _____ $I_{in} =$ _____
 $R_{in} =$ _____
 $V_{out} =$ _____ $I_{load} =$ _____ $V_{oc} =$ _____
 $R_{out} =$ _____
Voltage gain $A_v = V_{out}/V_{in} =$ _____
Current gain $A_i = I_{load}/I_{in} =$ _____