CSU11031 Electronics Assignment 3

Connect up the circuit below using Multisim (or CircuitLab if Multisim is not working) placing the voltmeters at the locations shown. Set the Process Transconductance (KP) to 0.02 (this is done by double clicking on the transistor giving you a menu on the right of the screen). You should use the NMOS 4T from the menu of components. Remember to connect the substrate to the Source.

(i) Run the simulation. What do you observe? Please provide a superimposed plot of the node voltages using Grapher. [10 Marks]

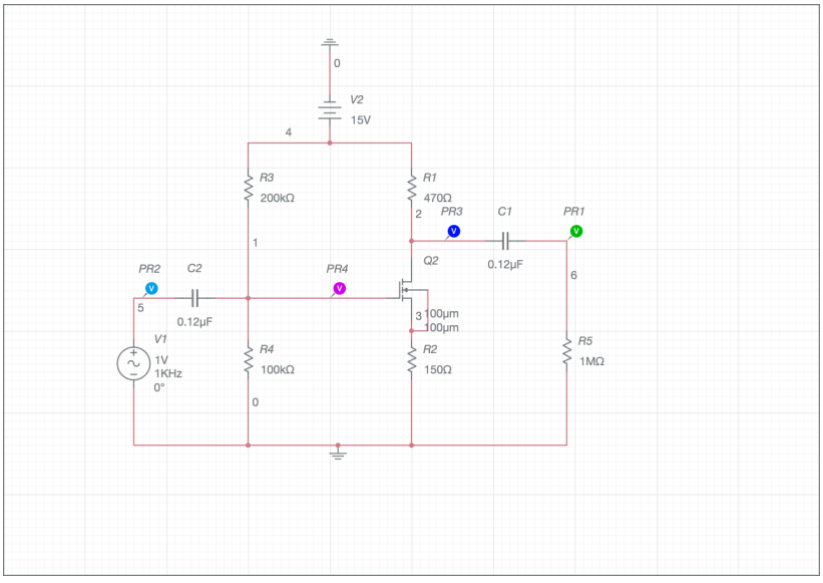
(ii) Calculate the voltage at the gate of the transistor. Does your answer tally with the result given in Grapher? [10 Marks]

(iii) Observe the Drain voltage in Grapher. Explain why it has an a.c. and a d.c. component. [20 Marks]

(iv) Explain the purpose of the capacitors at the input and the output. [10 Marks]

(v) You will observe that the output voltage is inverted with respect to the input voltage. Explain why this is so. [20 Marks]

(vi) Estimate the gain of this amplifier? [10 Marks]



Note: Your report should contain all of the circuits you implemented and associated calculations and explanations. The header page should state the title (CSU11031 Electronics Assignment 3), your name and your student number. You should note that most of the marks go for the explanation of your observations. 20 Marks go for presentation. Your report will be downgraded if it does not meet a minimum acceptable standard.