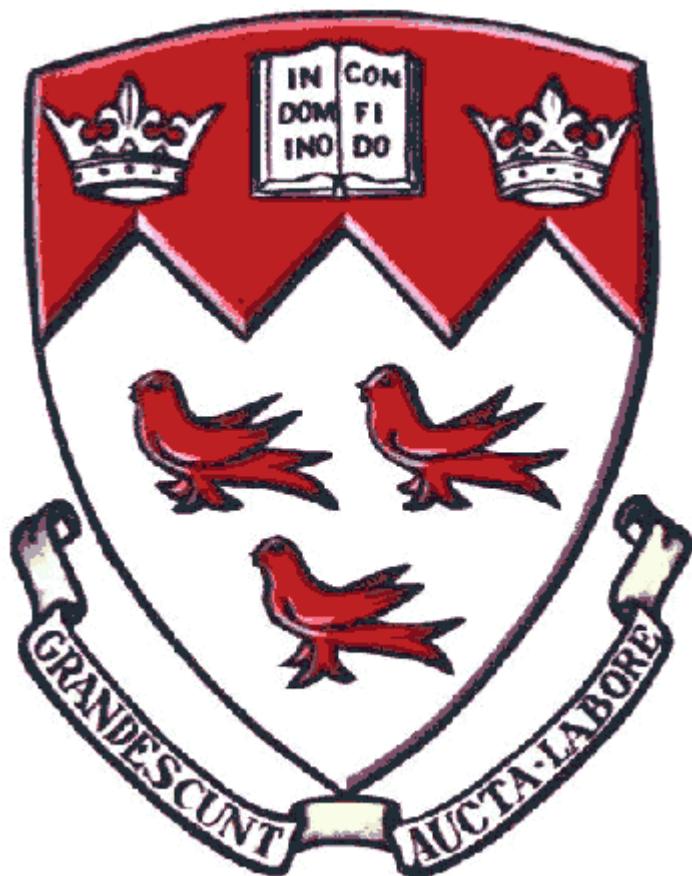


SPICE Assignment 1

ECSE 330 - Introduction to Electronics

Razi Murshed – 260516333

Md Mushfiqur Rahman - 260576385



Question 1

Part 1

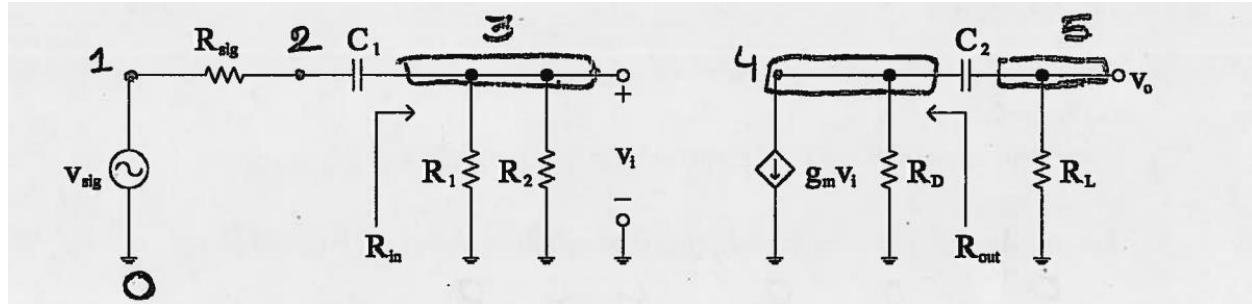


Figure 1:Circuit Diagram with Nodes Labelled

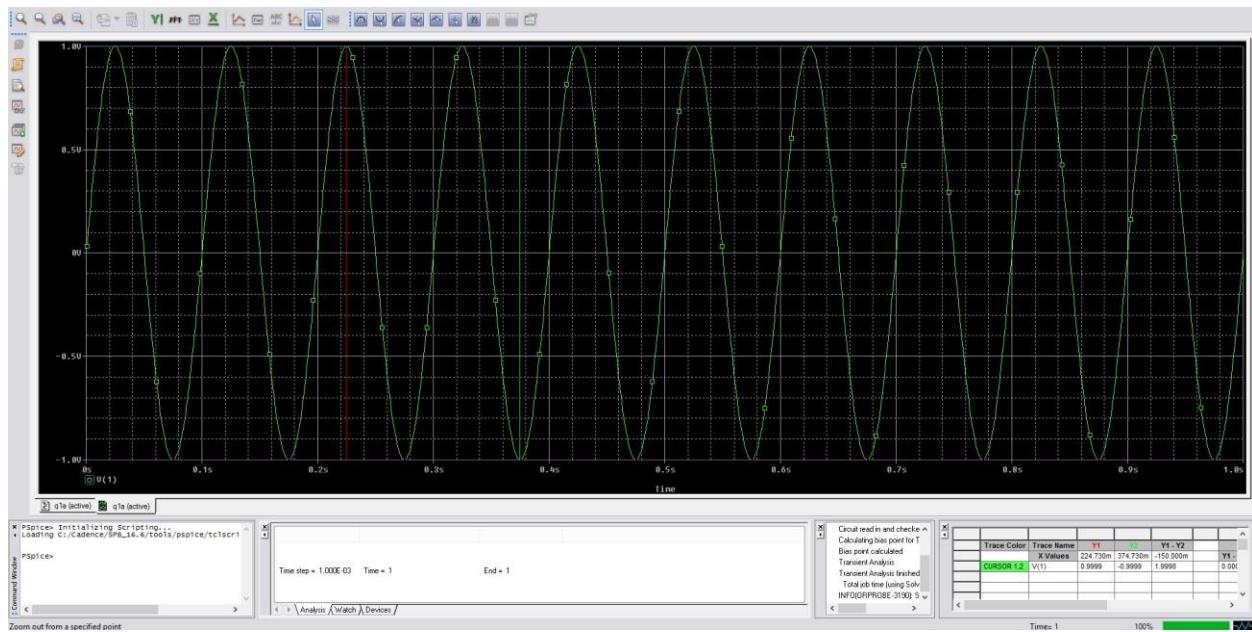


Figure 2:VSig Peak To Peak 2V

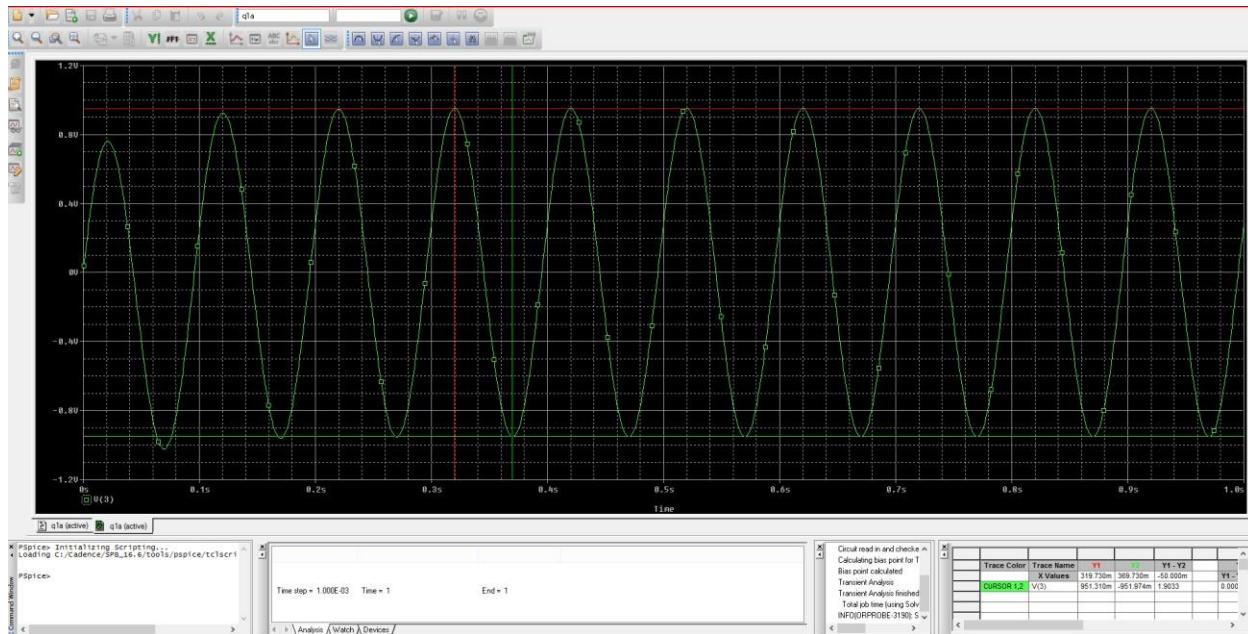
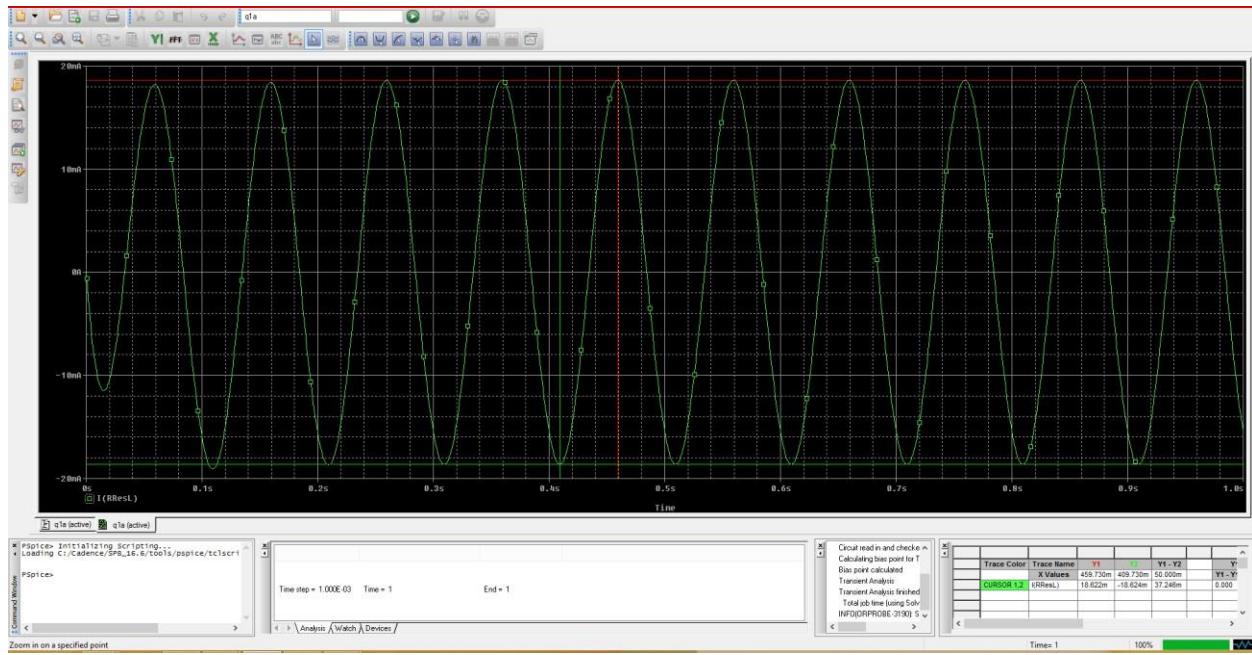


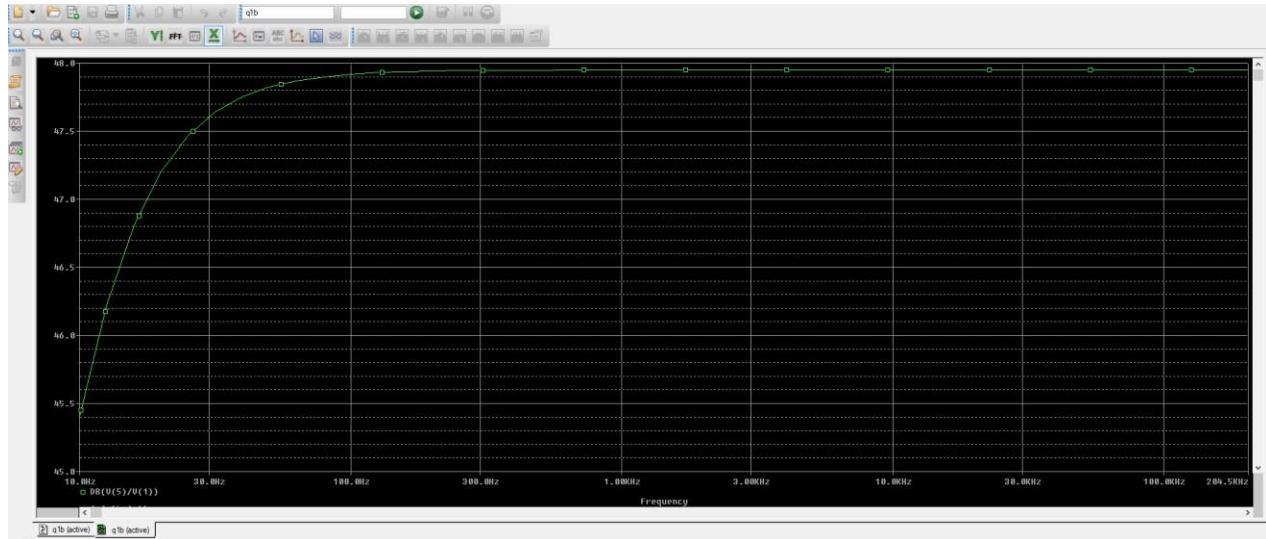
Figure 3: Vi Peak to Peak 1.9V



Figure 4: Vo Peak to Peak 372.4V

Figure 5: I_o Peak to Peak 34.246 mA

Part 2

Figure 6: $A(V_o/V_{sig})$

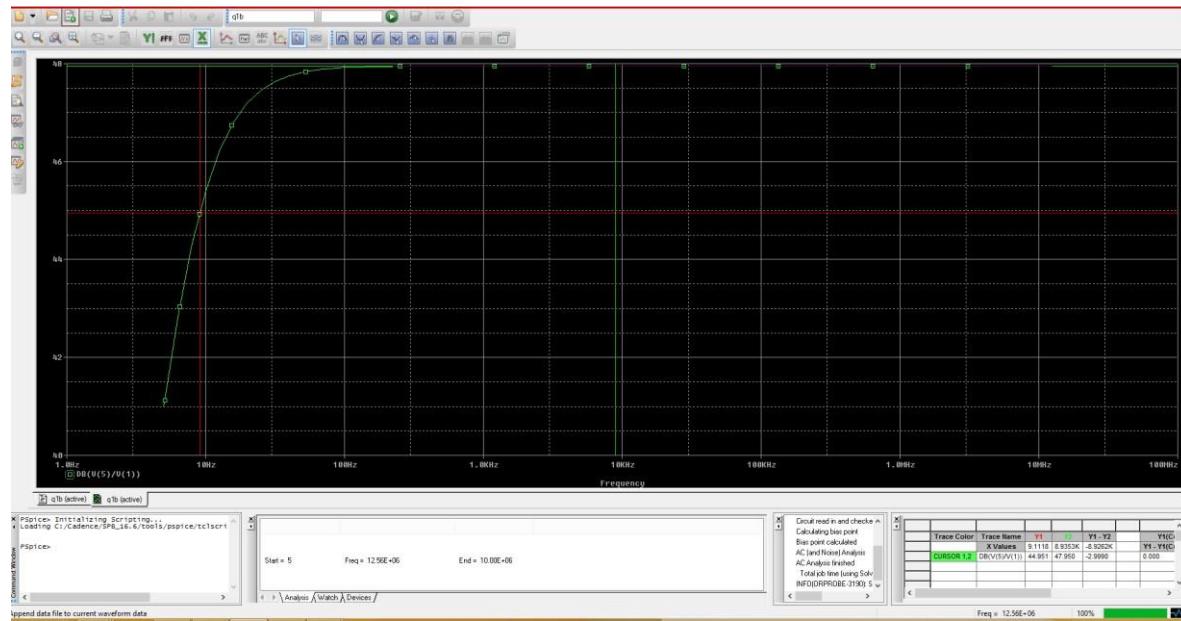
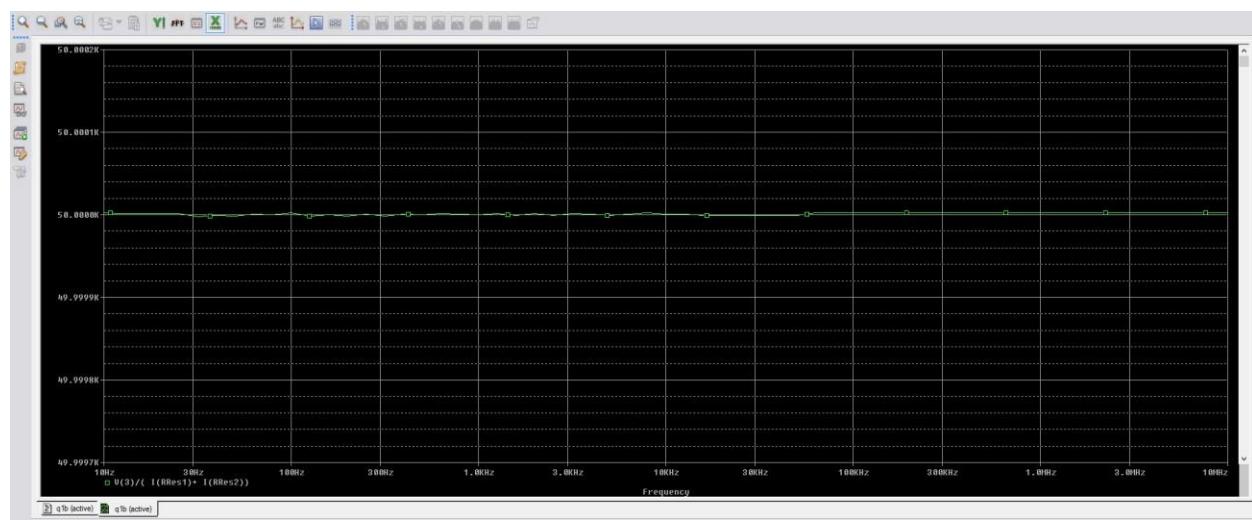


Figure 7: 3db Cutoff = 9.1Hz as shown by the cursor

Figure 8: $R_{in} = (V_i/I_{R1} + I_{R2}) = 50K\Omega$

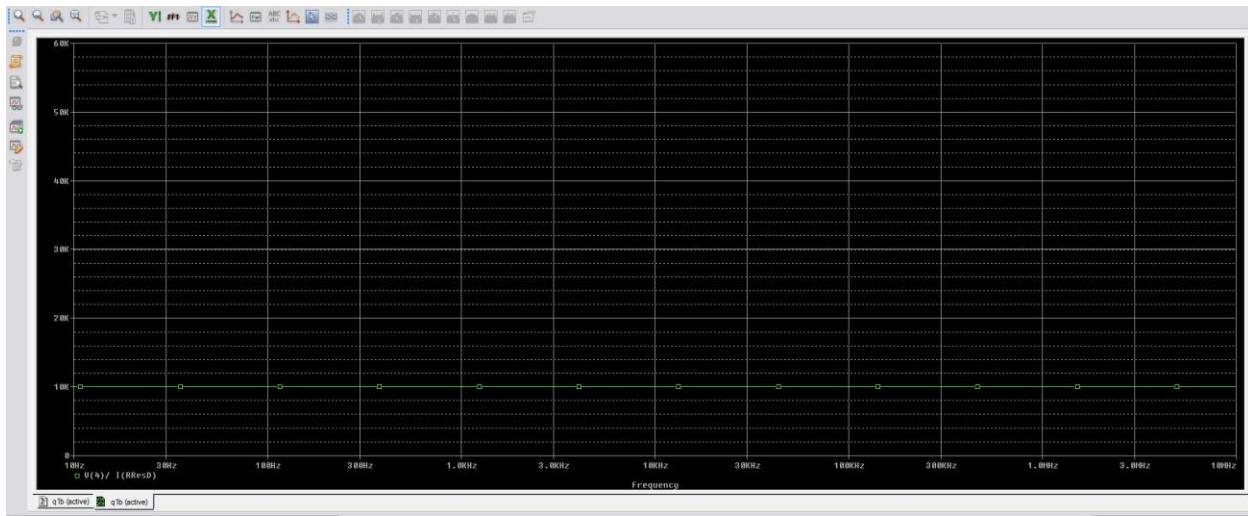


Figure 9: $R_{out} = R_d = 10K\Omega$

Question 2

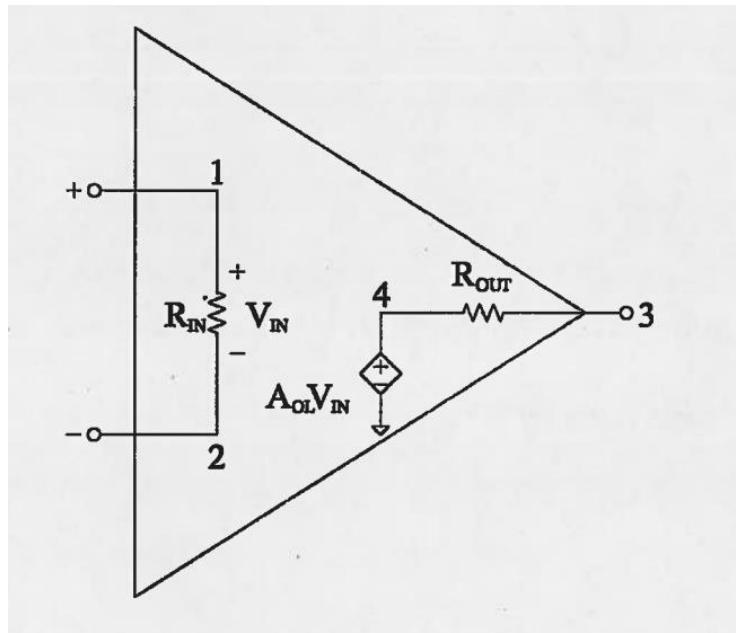


Figure 10: Op amp Circuit Diagram with Nodes labelled

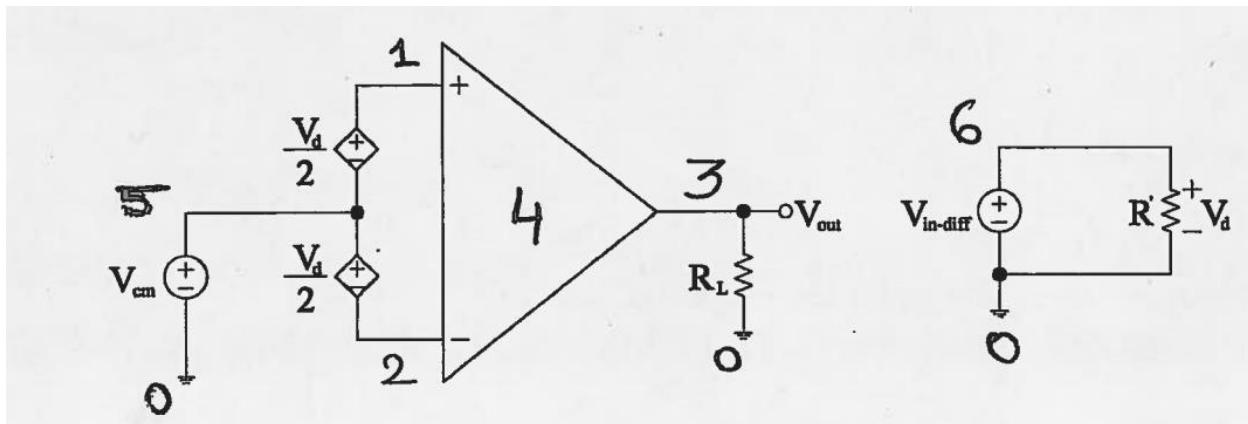
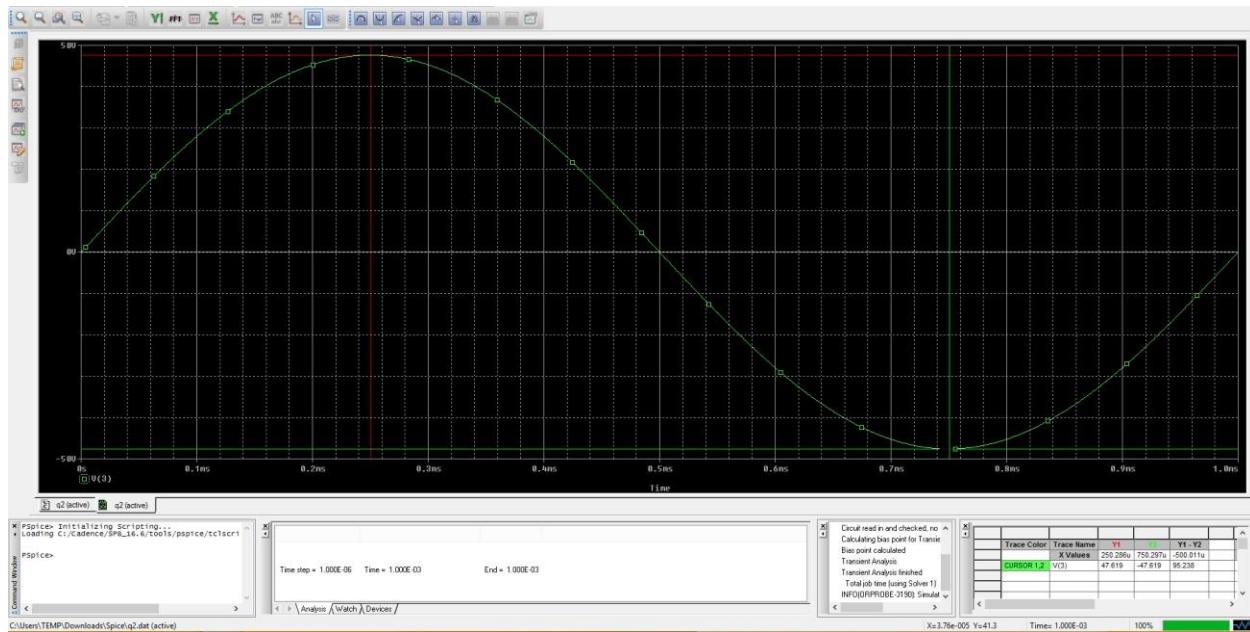
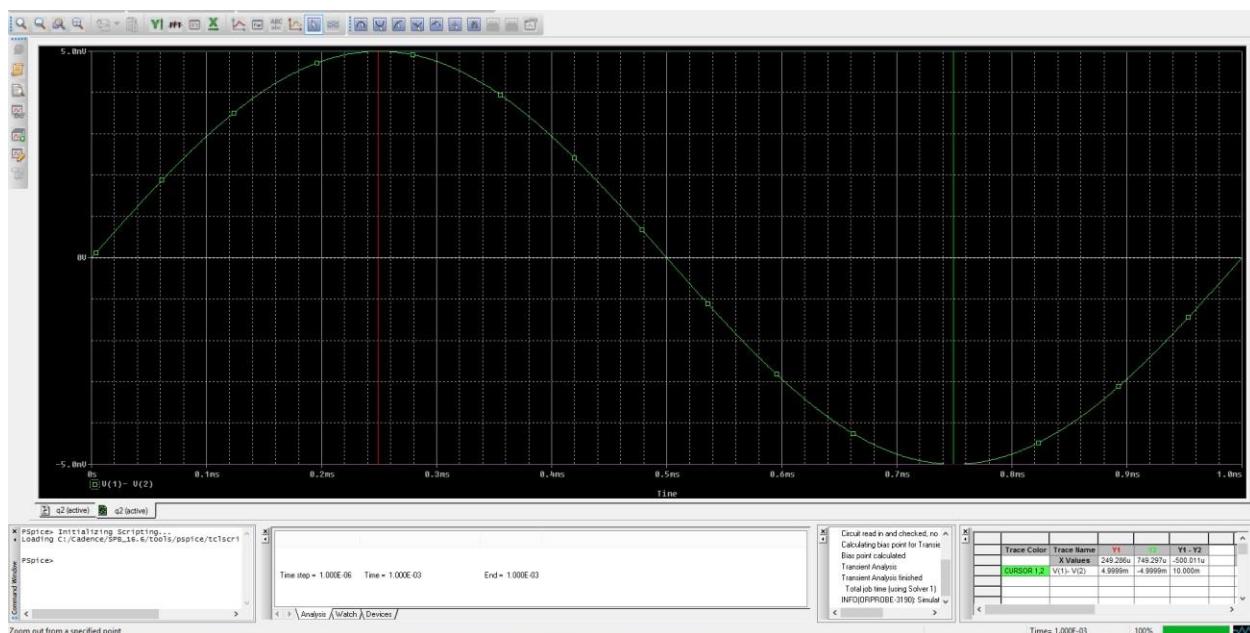


Figure 11: Standard test bench with Nodes labelled

Figure 12: V_{out} 95.238VFigure 13: V_{in} Peak to Peak 10mV

Question 3

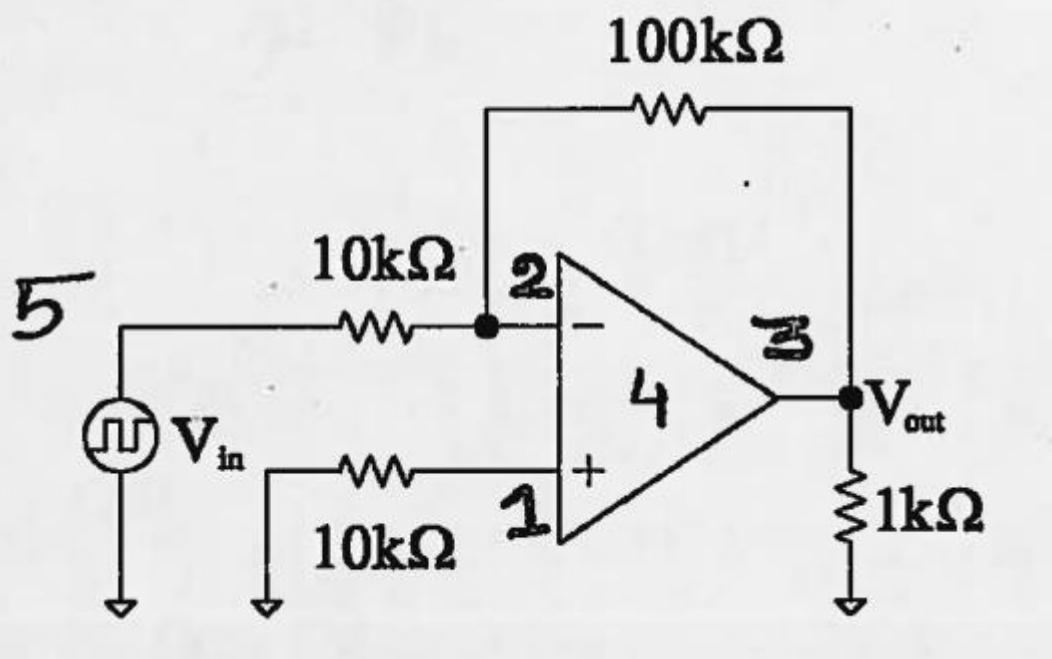


Figure 14: Circuit Diagram with Nodes labelled

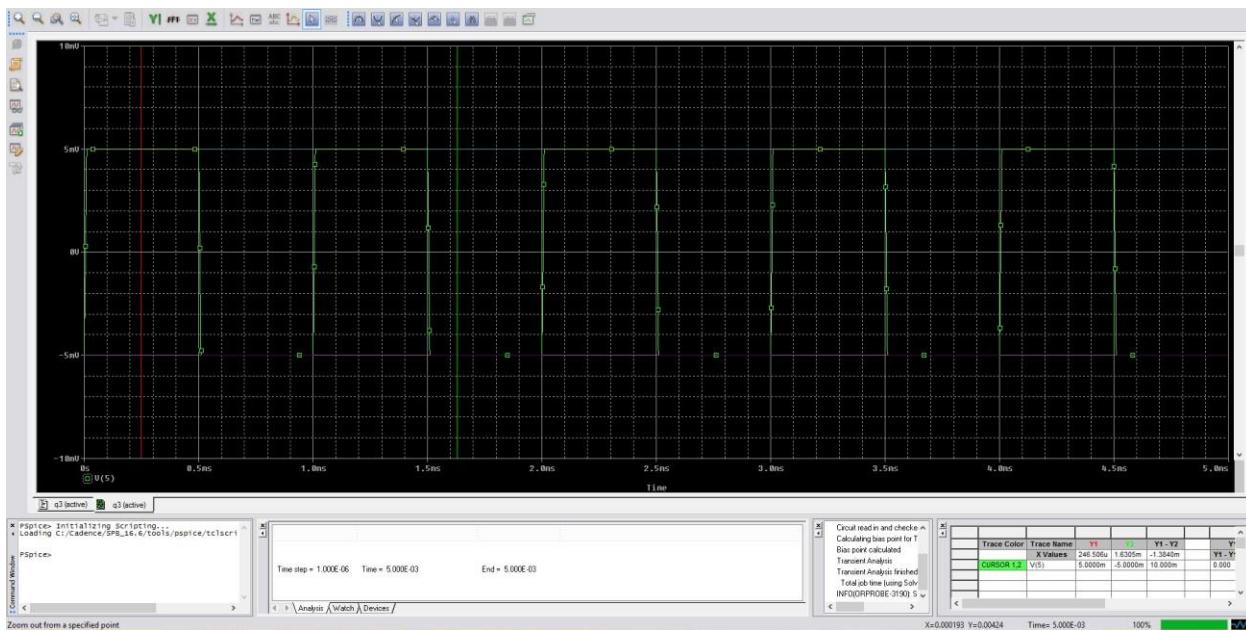


Figure 15: Vin Peak to Peak 10mV

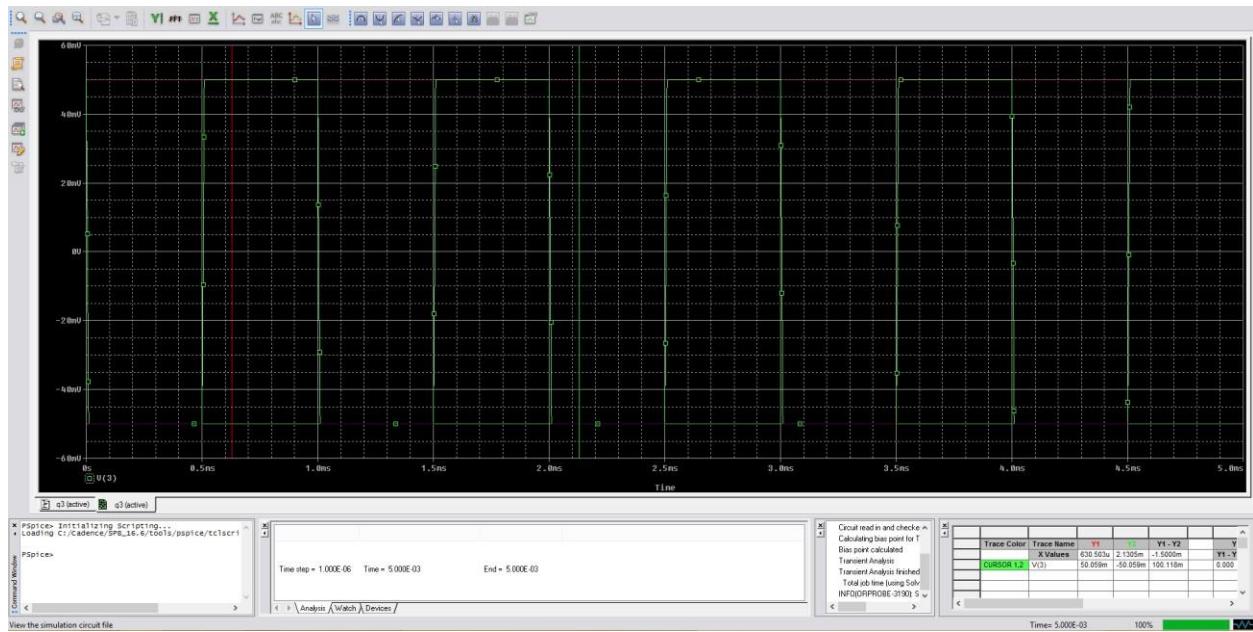


Figure 16: V_{out} Peak to Peak 100mV

Question 4

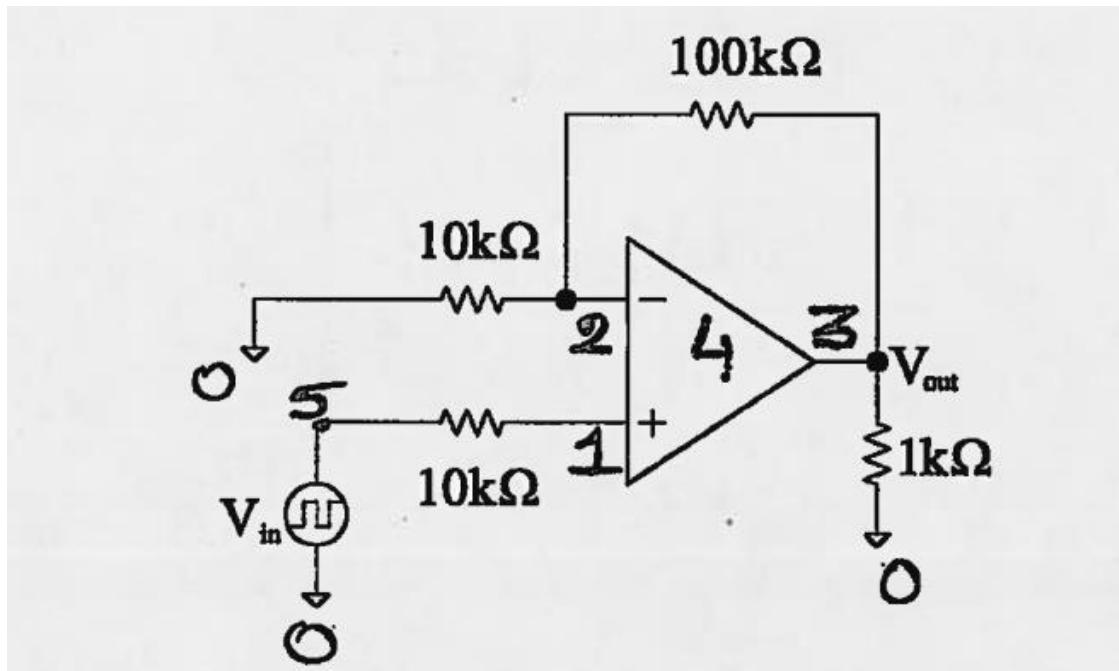


Figure 17: Circuit Diagram with Nodes labelled

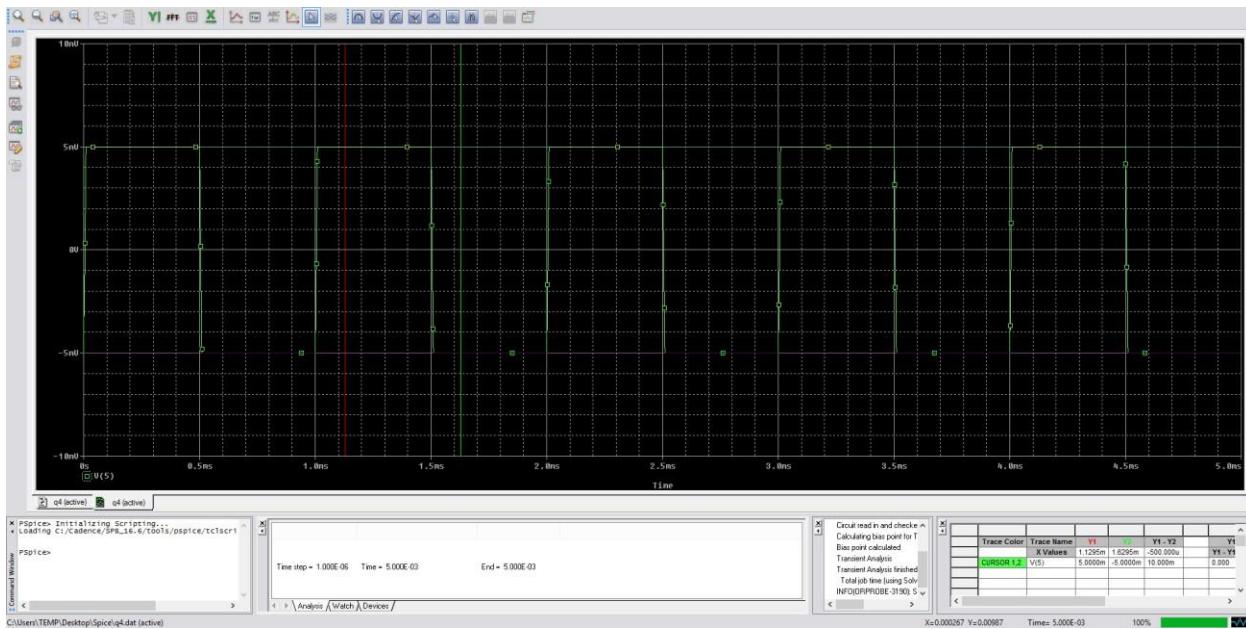


Figure 18: V_{in} Peak to Peak 10mV

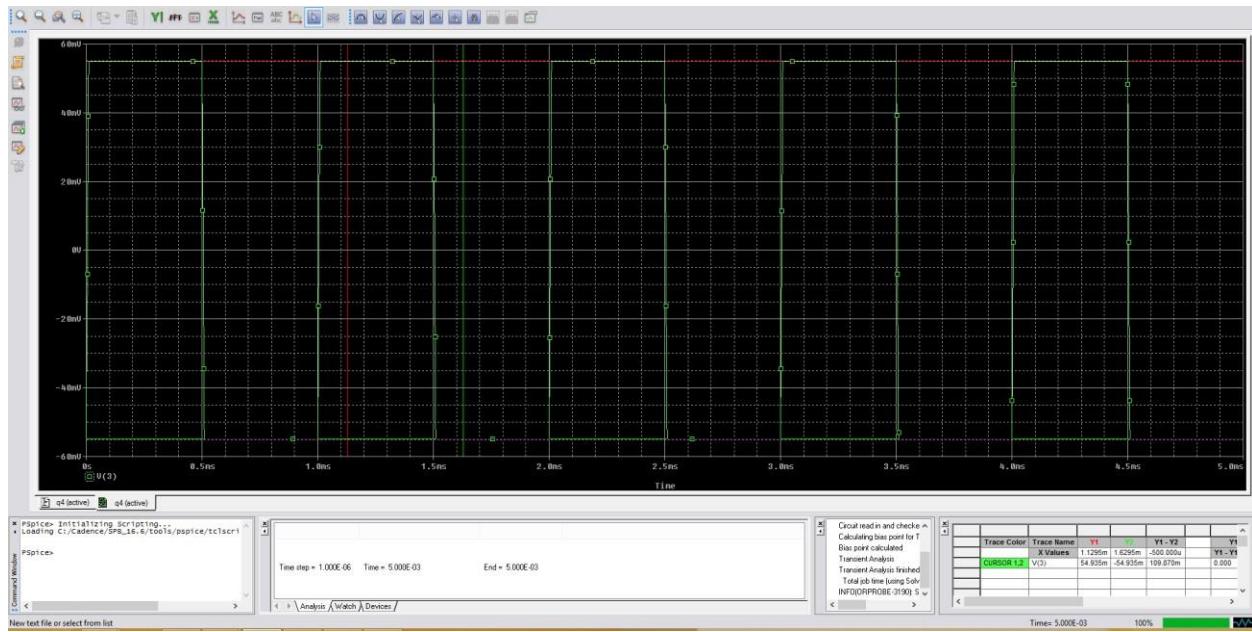


Figure 19: V_{out} Peak to peak 110mV

Question 5

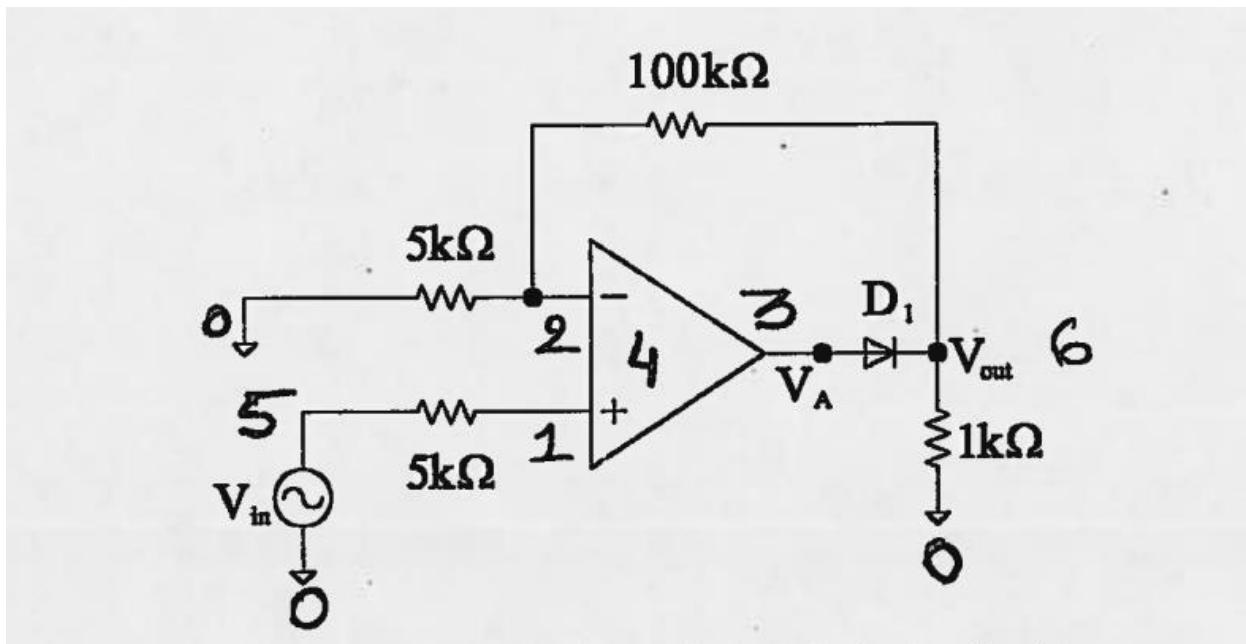


Figure 20: Circuit Diagram with Nodes labelled

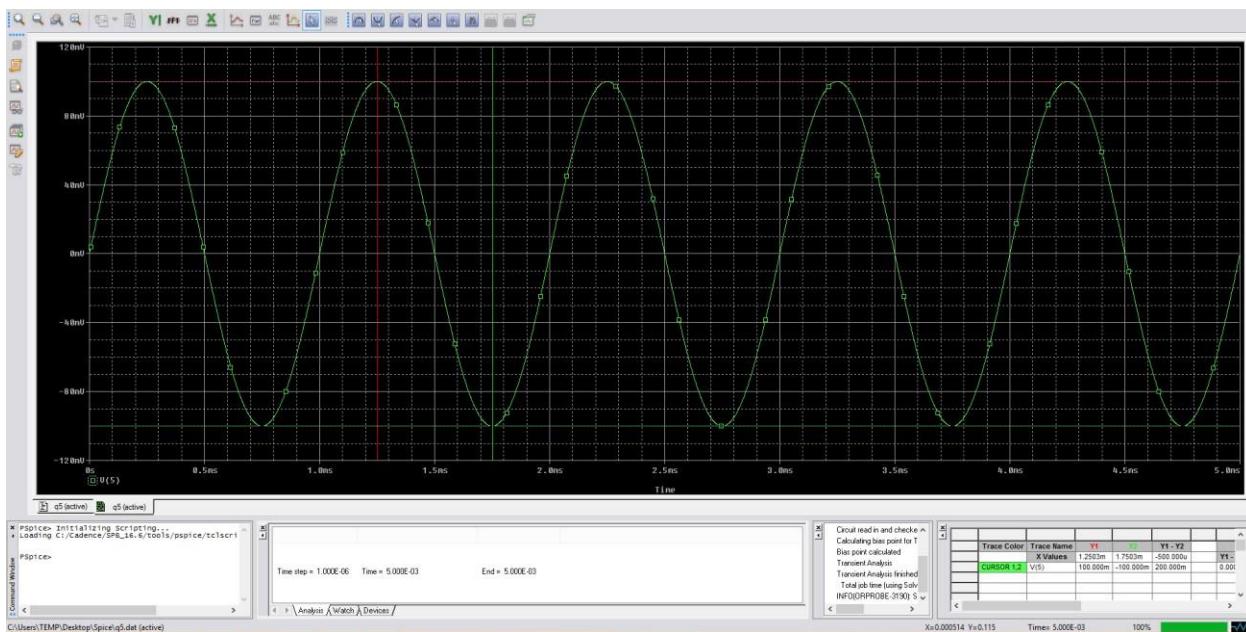
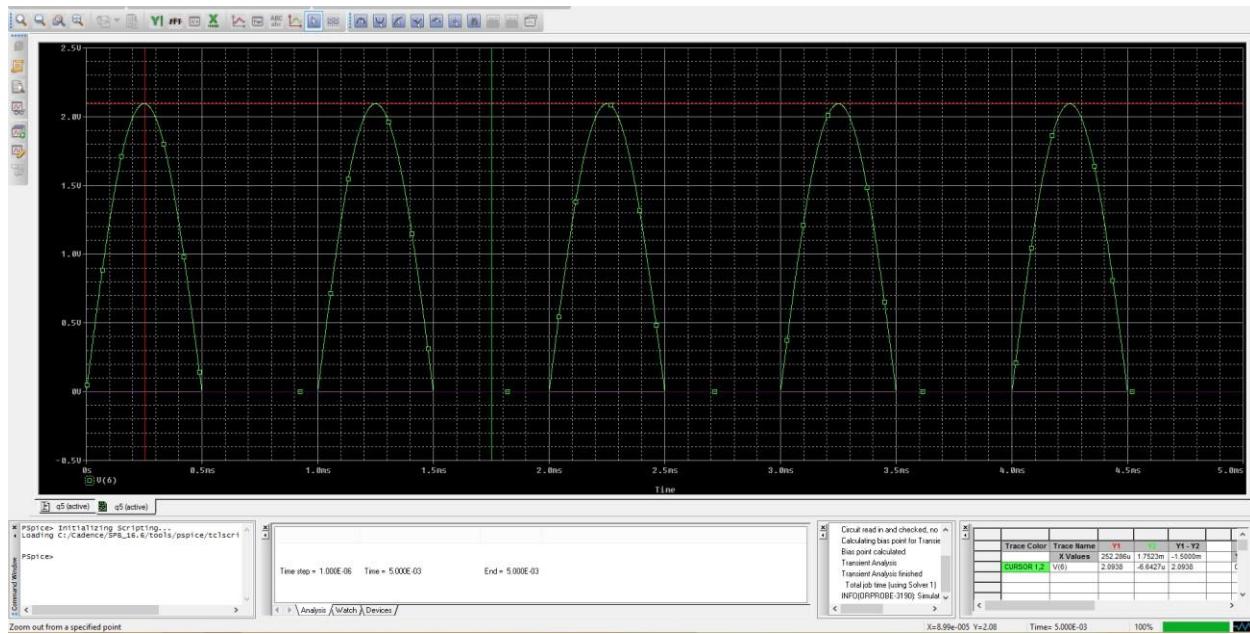
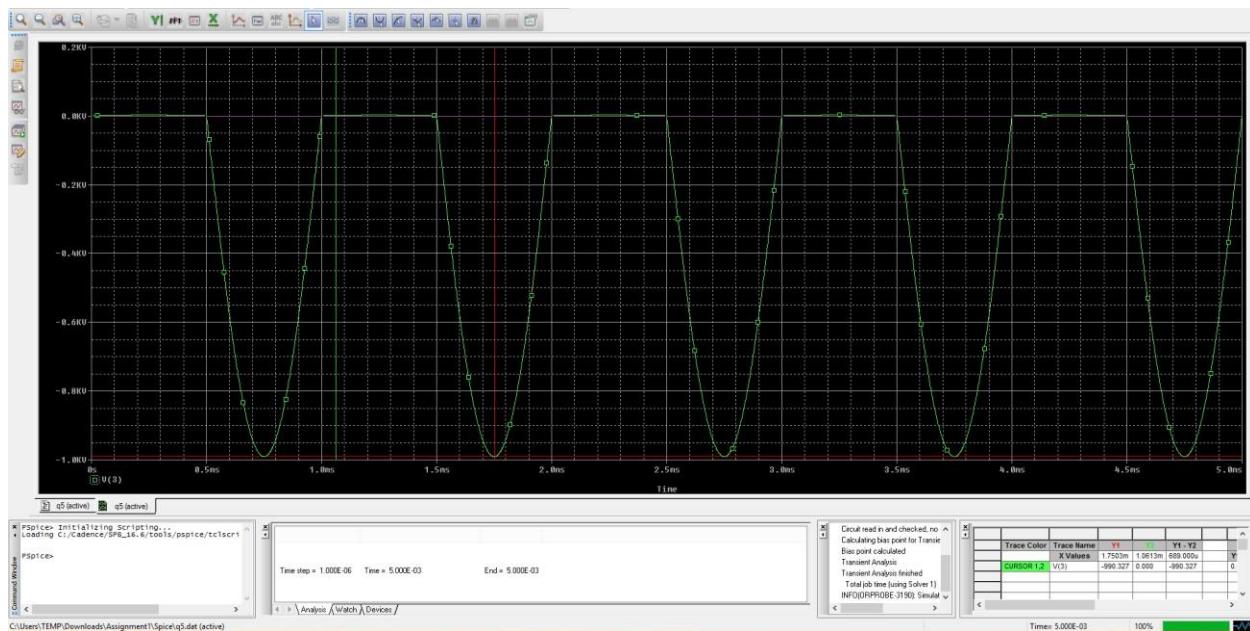
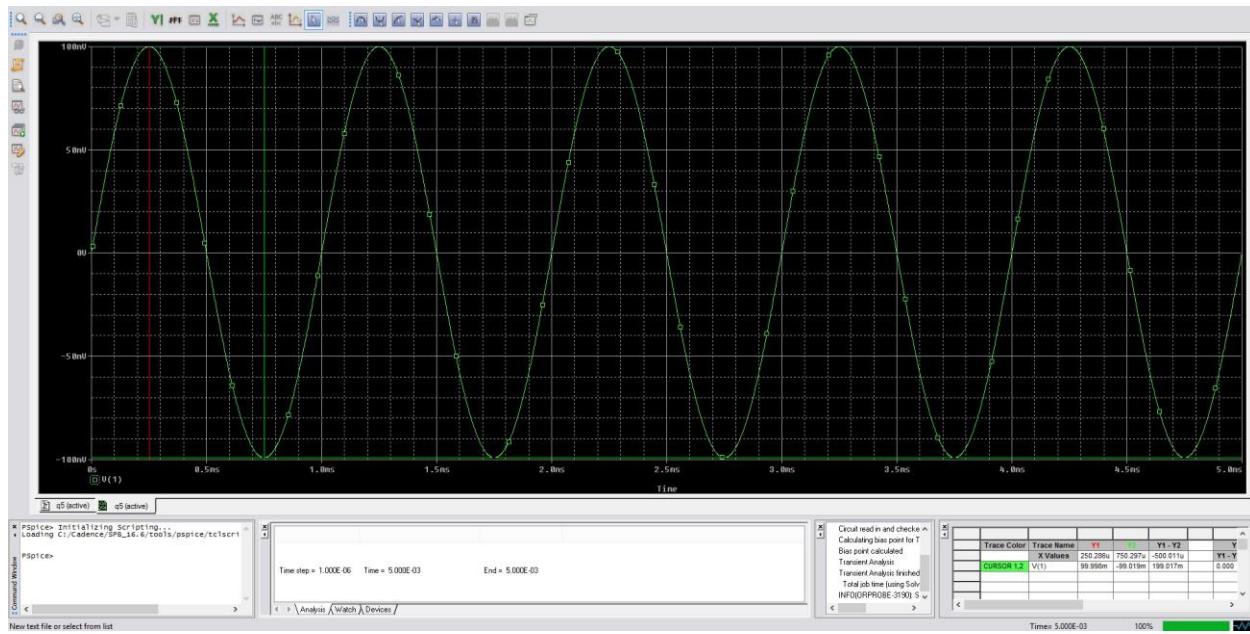
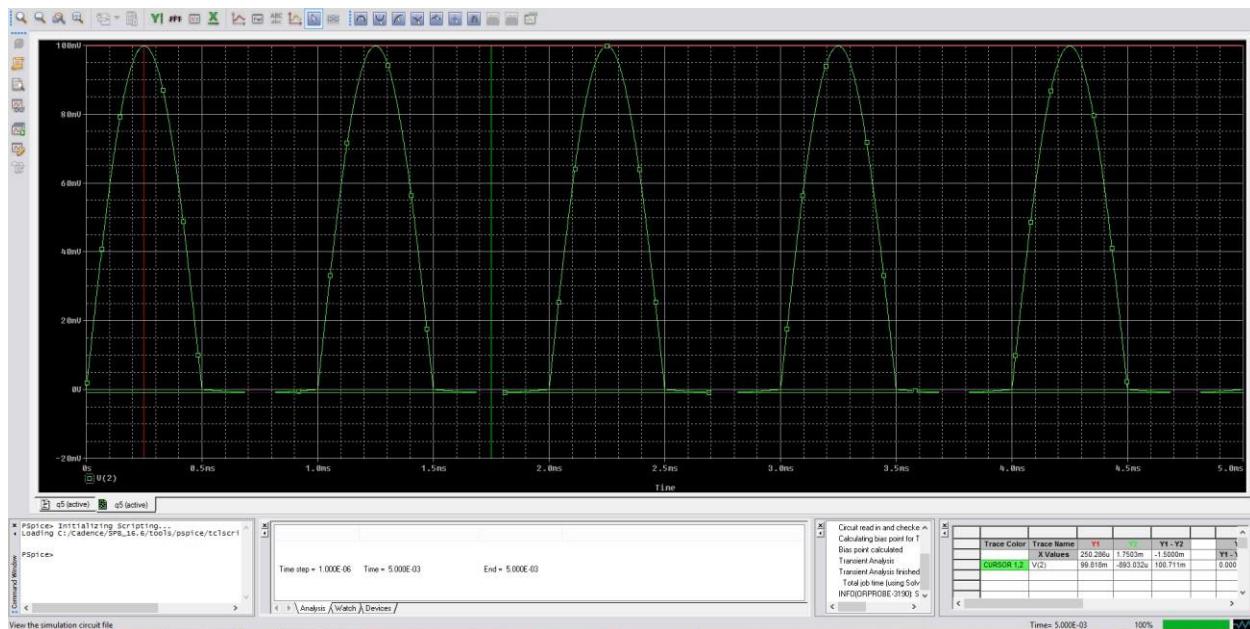


Figure 21: V_{in} Peak To Peak 200mV

Figure 22: V_{out} Peak To Peak 2.2VFigure 23: V_a peak to peak 990.3V

Figure 24: V_+ Peak To Peak 200mVFigure 25: V_- Peak To Peak 100.7mV

Question 6

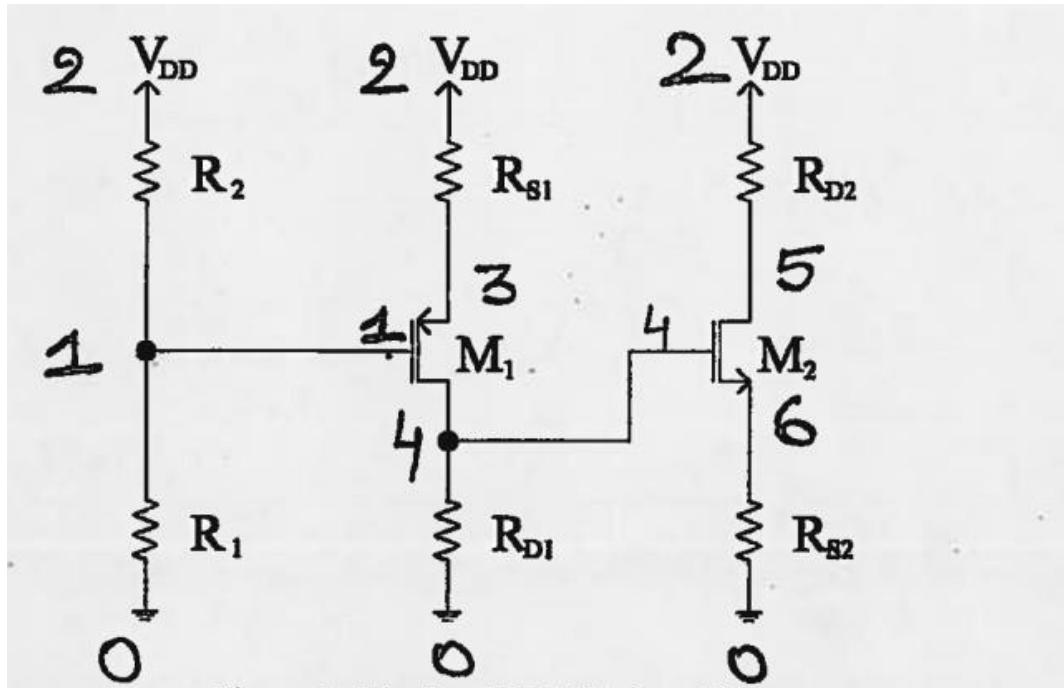


Figure 26: Circuit Diagram with Nodes labelled

Part A

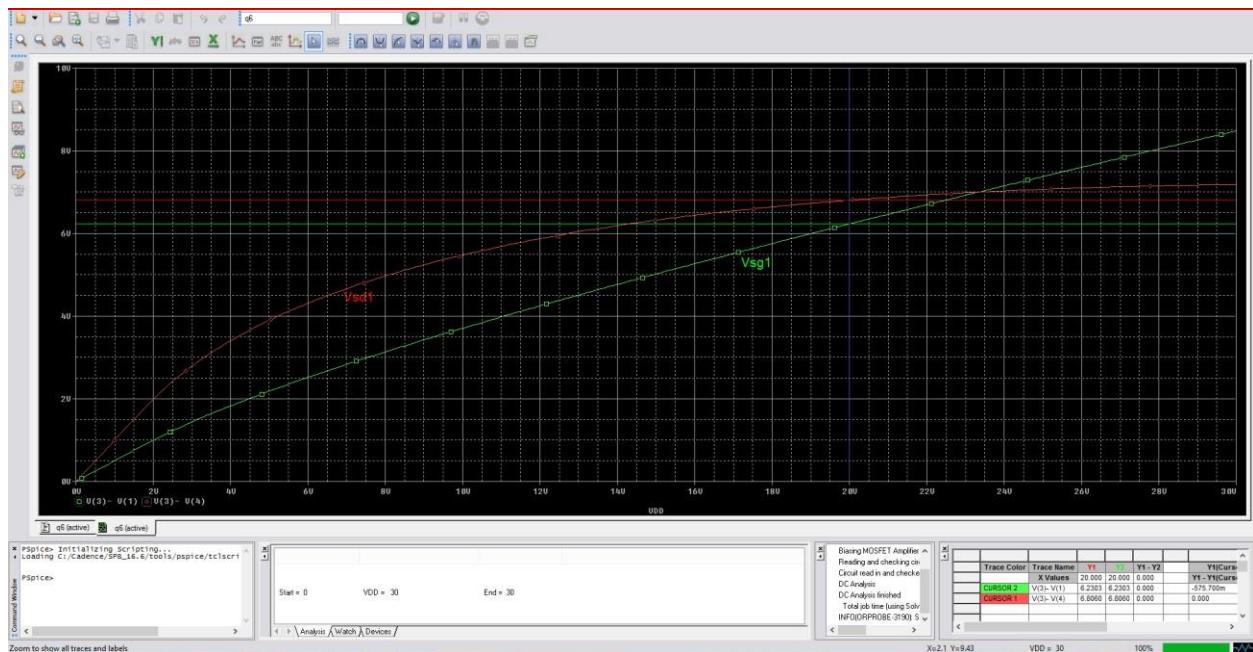
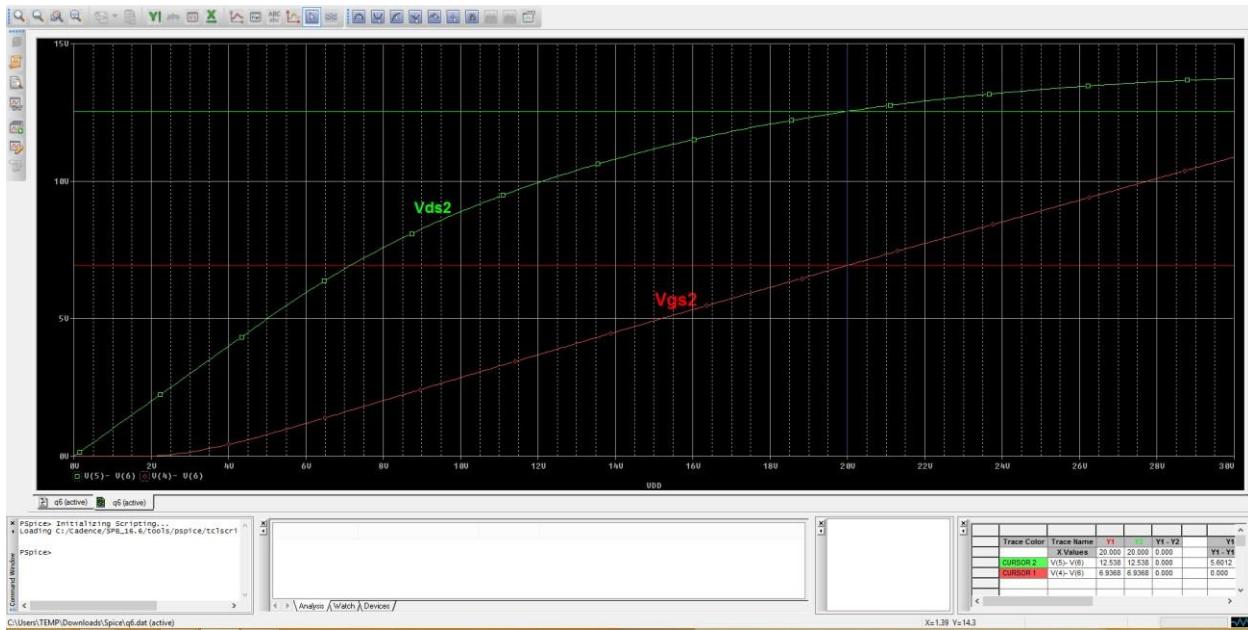
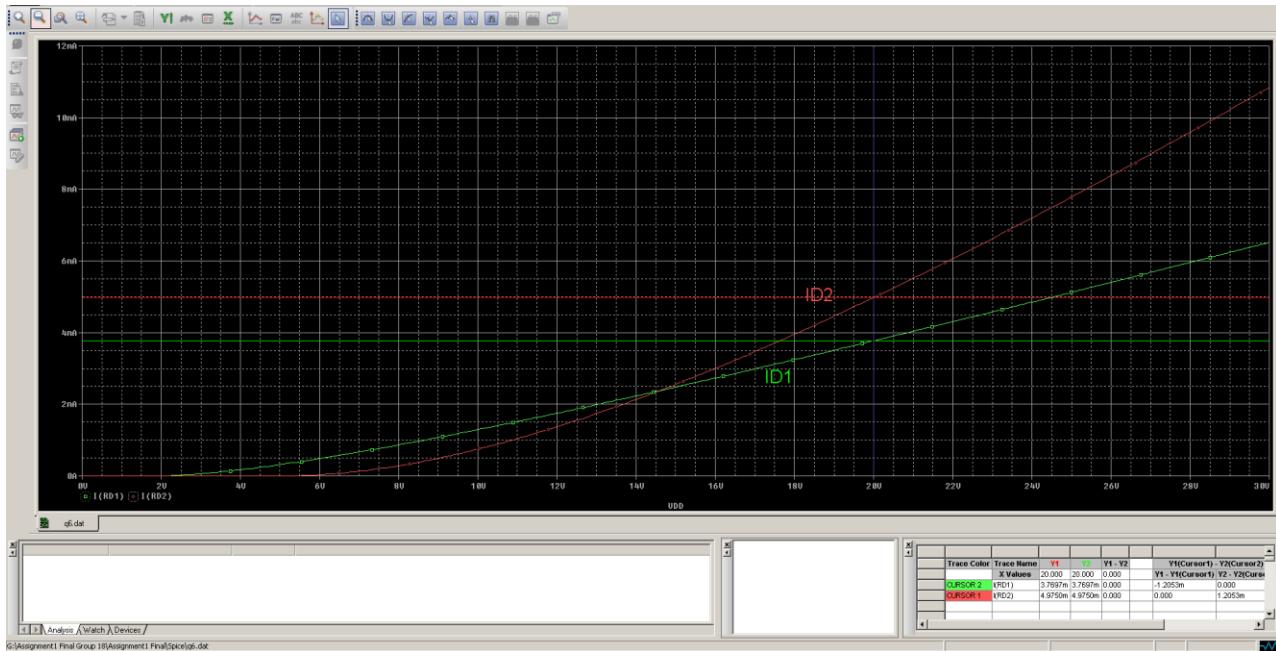


Figure 27: $V_{sg1} = 6.23V$ and $V_{sd1} = 6.81V$ at 20V

Part B

Figure 28: $V_{gs2} = 6.93V$ and $V_{ds2} = 12.53V$ at 20V

Part C

Figure 29: $ID_1 = 3.77mA$ and $ID_2 = 4.97mA$ at 20V

Question 7

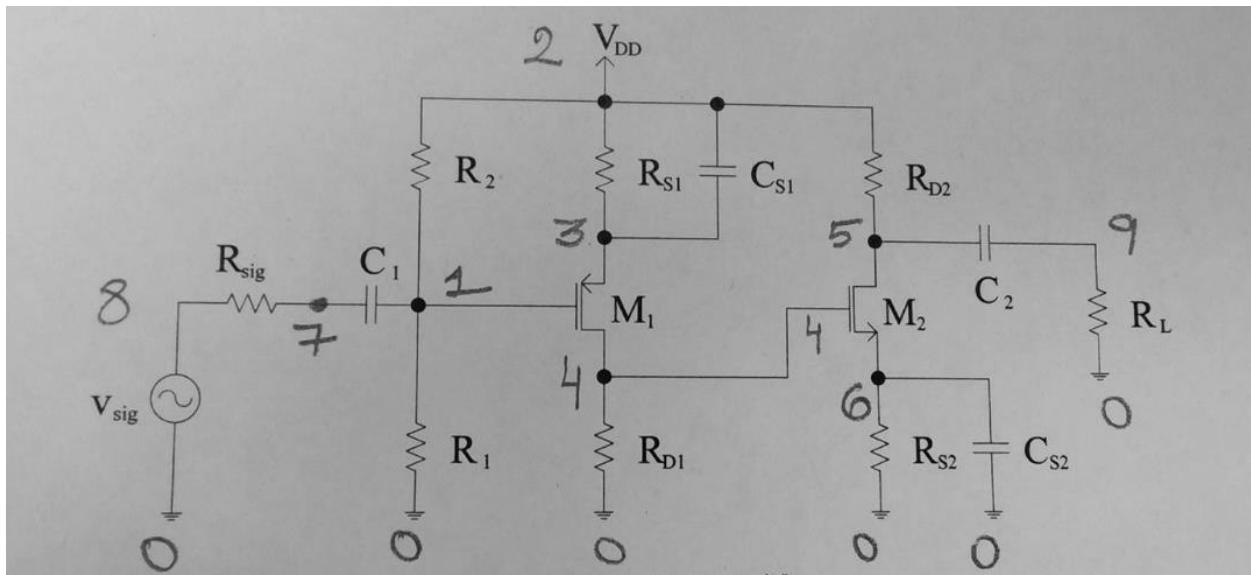


Figure 30: Circuit Diagram with Nodes labelled

Part 1

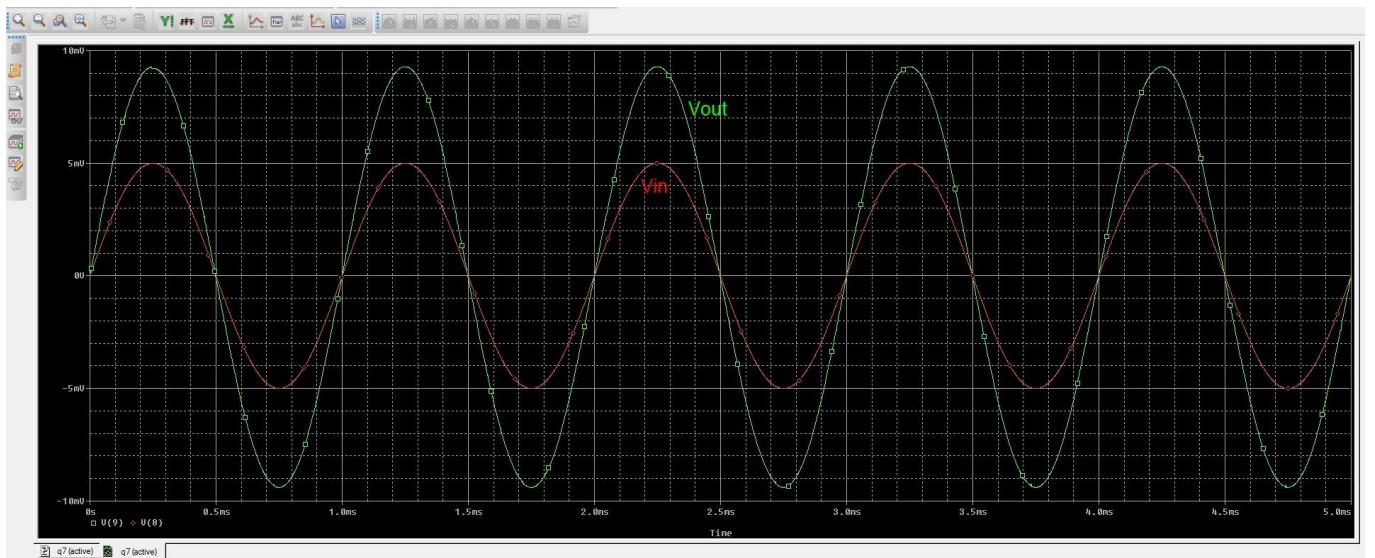
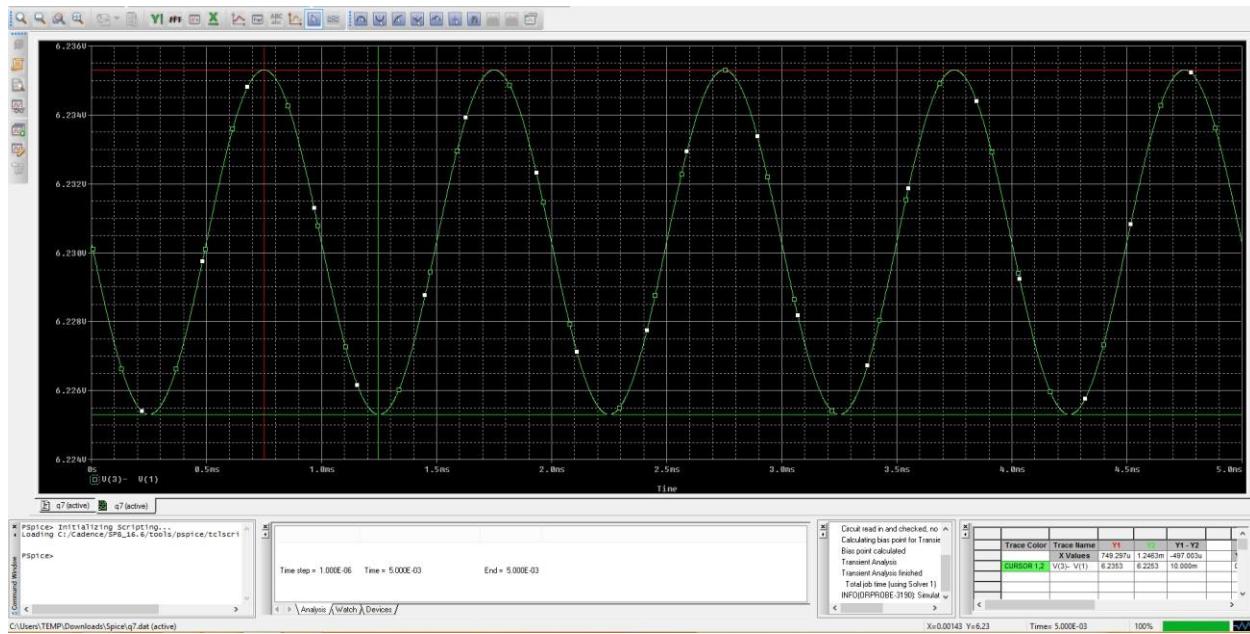
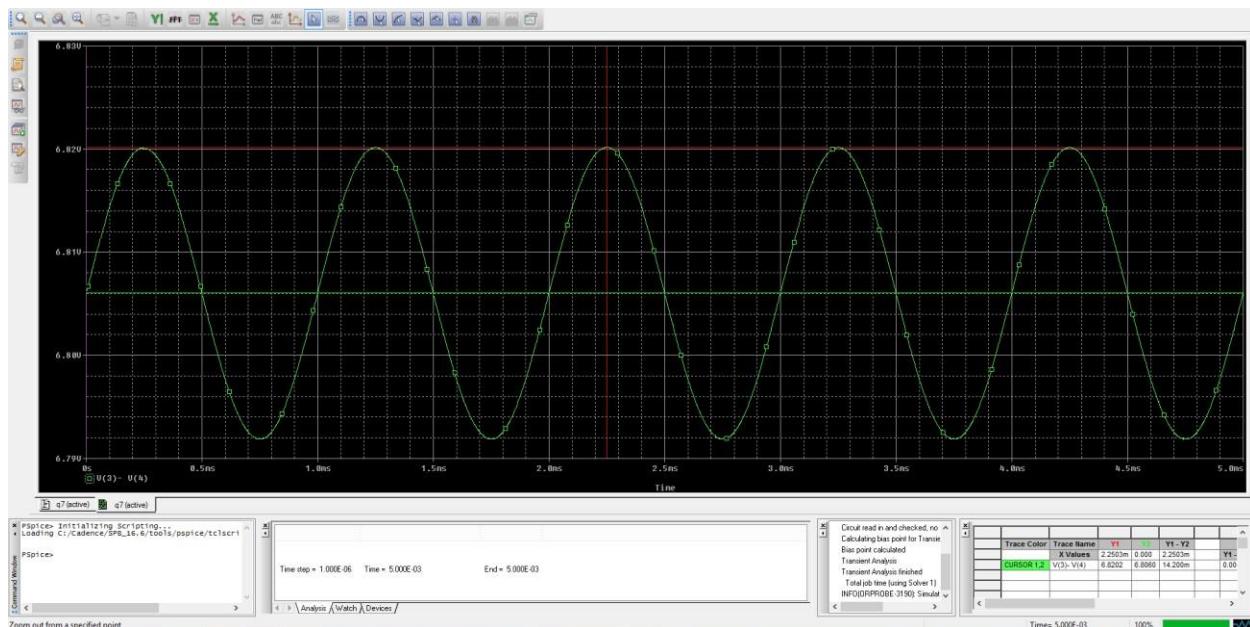
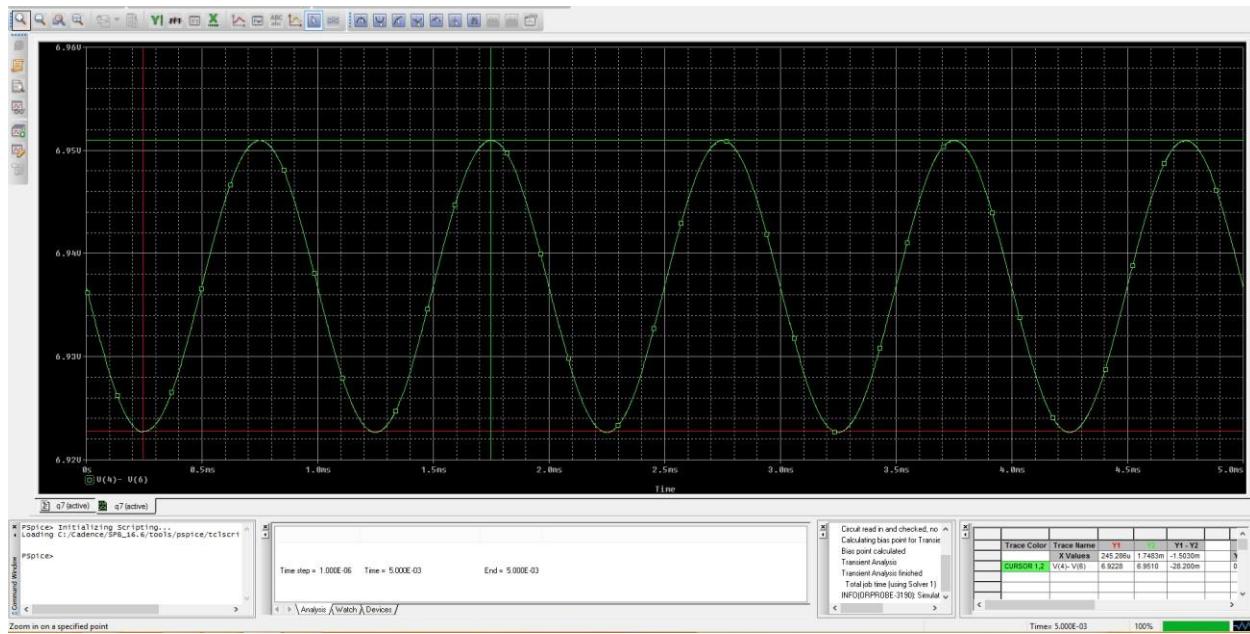
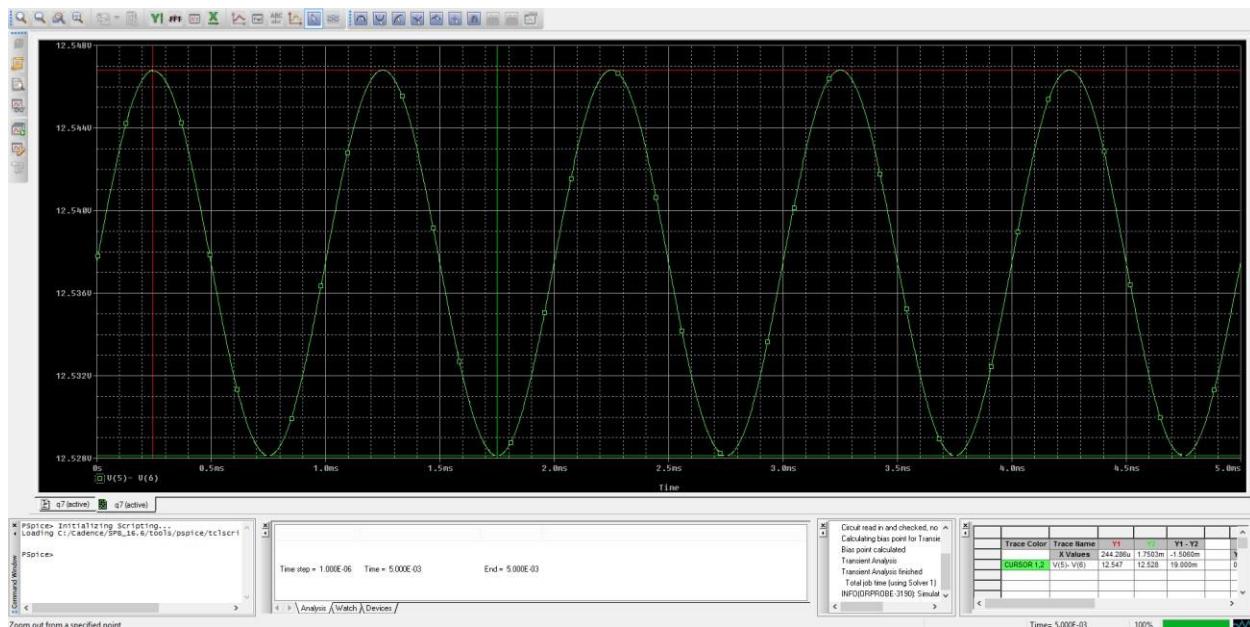


Figure 31: V_{sig} Peak 5mV and V_{out} Peak 9.223mV

Figure 32: V_{sg1} Peak 6.235VFigure 33: V_{sd1} Peak 6.820V

Figure 34: V_{GS2} Peak 6.951VFigure 35: V_{DS2} Peak 12.547V

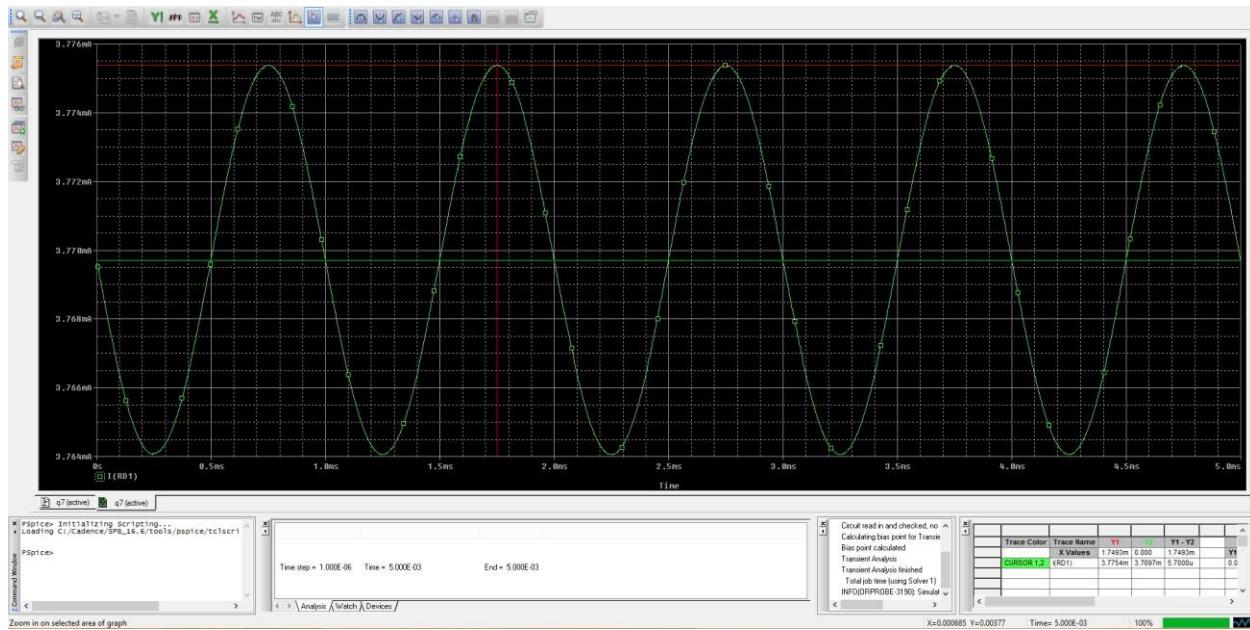


Figure 36: ID1 Peak Value: 3.775mA

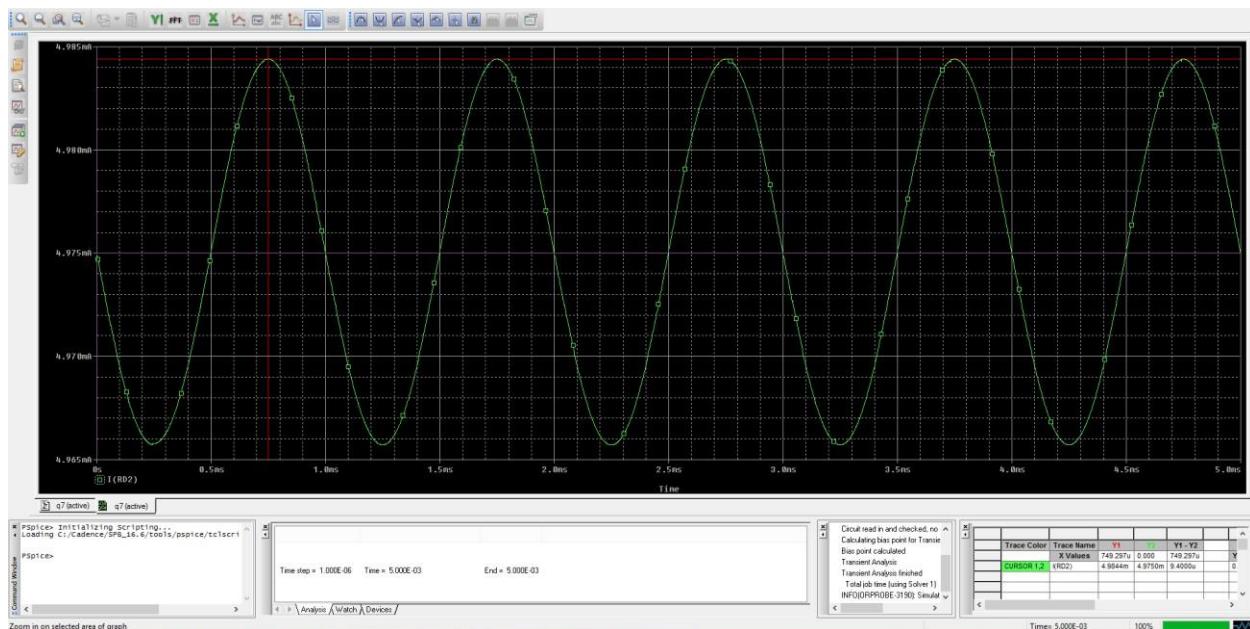


Figure 37: ID2 Peak Value : 4.98mA

Part 2

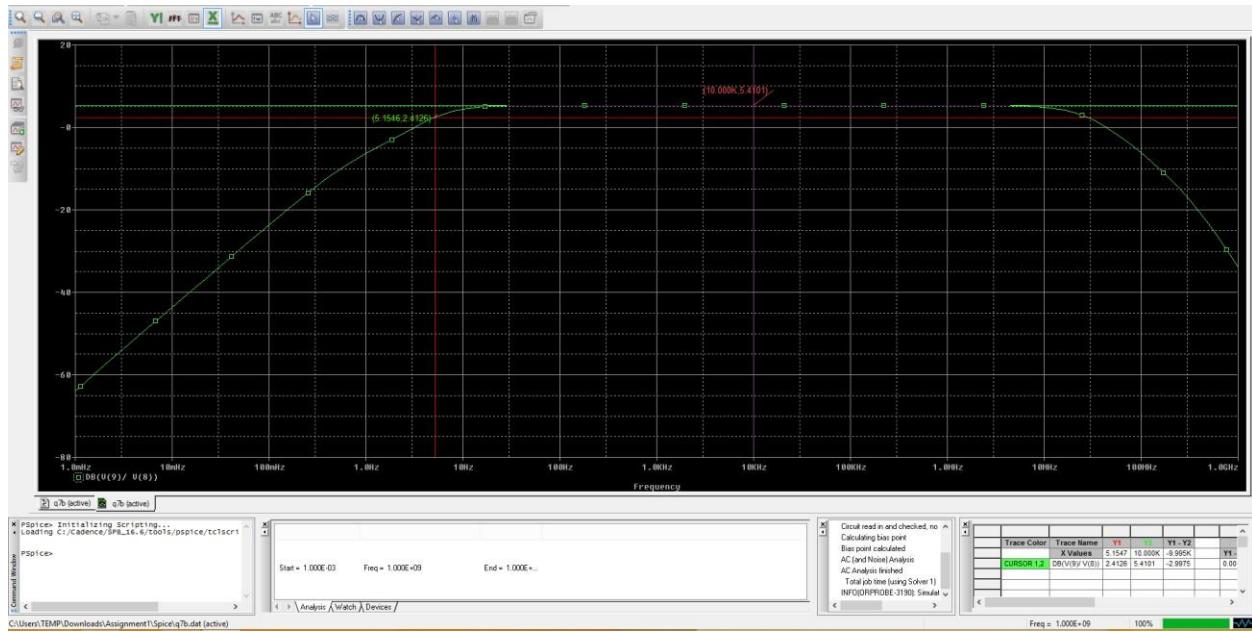


Figure 38: Bode Plot: 5.4101DB gain at 10Khz and 5.1556Hz at 2.4126 DB which is the 3DB cutoff