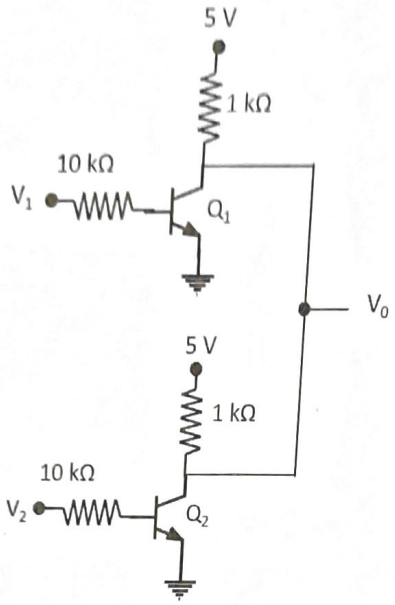
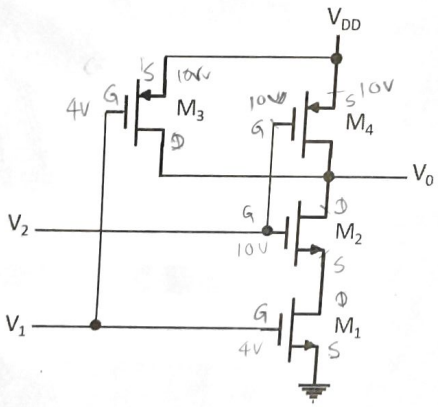
4) Consider the logic circuit with BJTs as shown below. Assume low voltage (V_{low})=0.2 V, high voltage (V_{high})=5 V. Assume β=50. Find out the truth table of the logic circuit. [8 marks]



5) Find out the output of the CMOS circuit when V_1= 4 V and V_2= 10 V. Given V_{DD}=10 V, K=0.25 mA/V^2 and the threshold voltages for M_1 and M_2 are 1 V, whereas the threshold voltages for M_3 and M_4 are -1 V. Assume M_1 and M_2 in active region. Verify the assumptions. [8 marks]



6) Consider MOSFET amplifier as shown below. Assume that the capacitors can be replaced by short circuits for the ac part of the circuit. The small signal model of the MOSFET is shown on the right side.