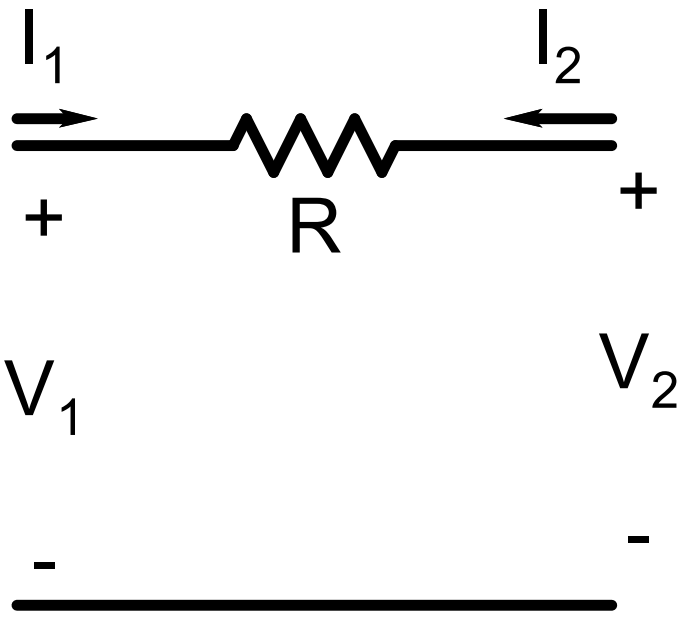
ESC201T : Introduction to Electronics

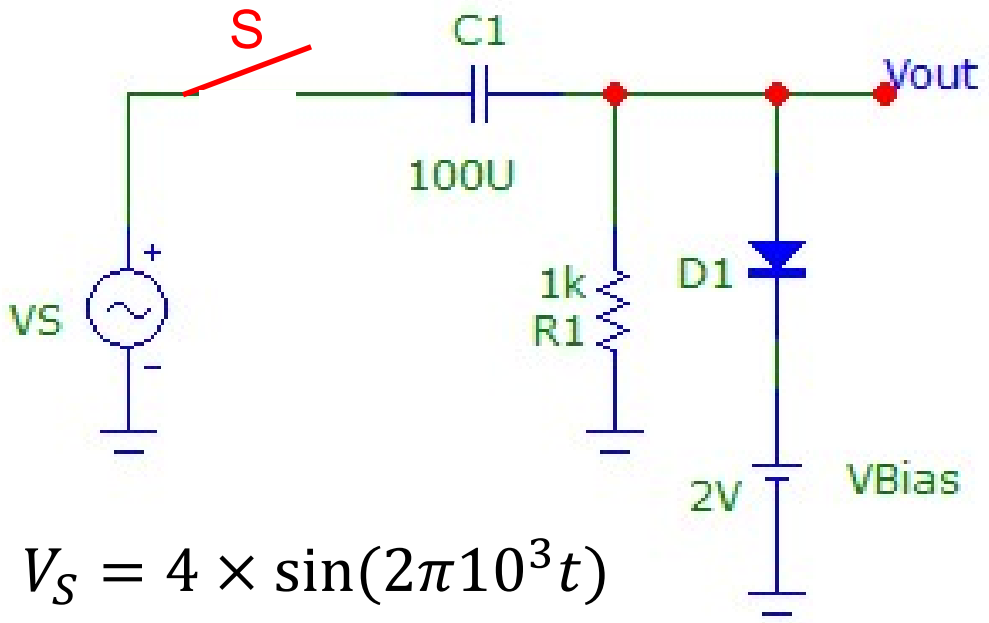
Quiz-3(11/11/2020)

There are 4 questions in this quiz

Q.1 Determine the h-parameters for the circuit shown. Show steps of your analysis. Express your final answer as $(h_{11}, h_{12}, h_{21}, h_{22})$ -----2marks

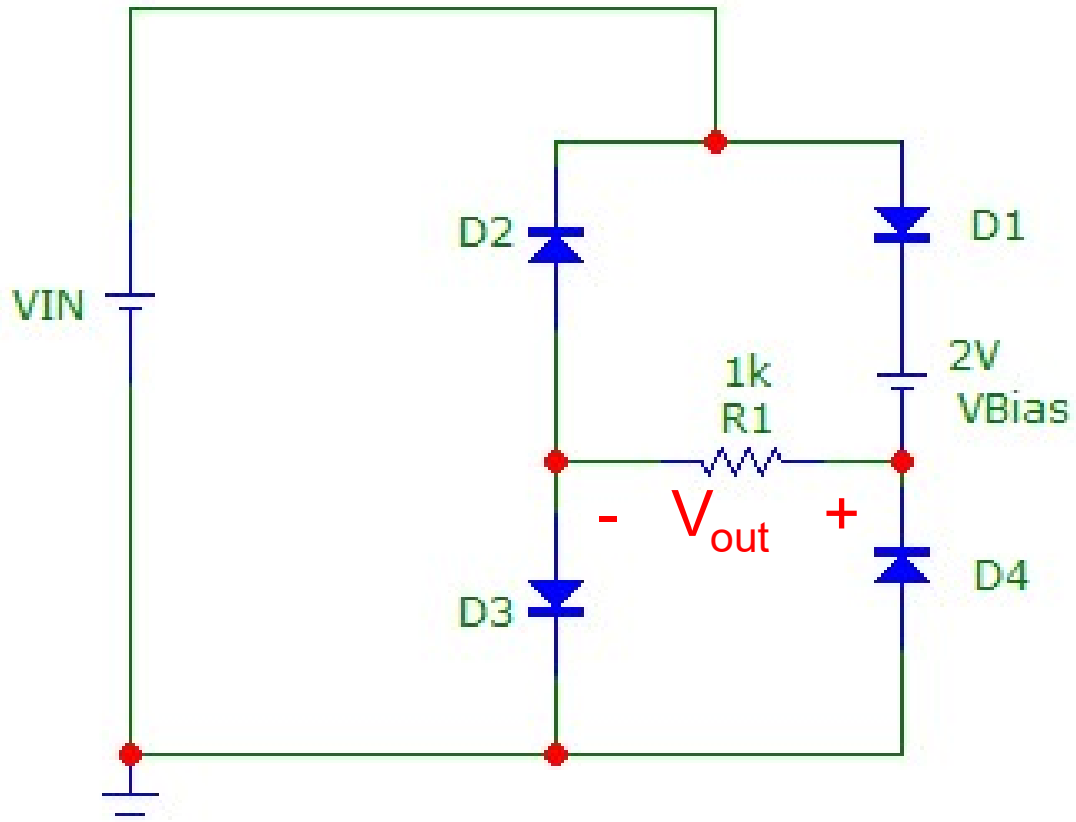


Q.2 In the circuit shown, the switch S is closed at t = 0. Sketch the output voltage V_{out} for one full sinusoidal cycle after switch is closed. Assume that diode is ideal with negligible forward voltage drop and does not conduct in reverse bias and prior to closing of switch, there is no charge on the capacitor. Label your graphs appropriately and justify your answer. ---3marks



$$V_S = 4 \times \sin(2\pi 10^3 t)$$

Q.3 For the circuit shown, sketch the output voltage V_{OUT} (across R1) vs. input voltage V_{IN} as it is varied from -5V to +5V. Assume that diodes are ideal with negligible forward voltage drop and do not conduct in reverse bias Label your graphs appropriately and justify your answer.---2marks



Q.4 The circuit shown has been designed to deliver a constant voltage of 6V across the load resistor RL which can have any value greater than or equal to 100 ohms . The chosen Zener diode has a breakdown voltage of 6V and can handle a maximum current of 100mA. Identify any potential problems with the design if input voltage VS can vary from 10 to 16 Volts. Justify your answer---3marks