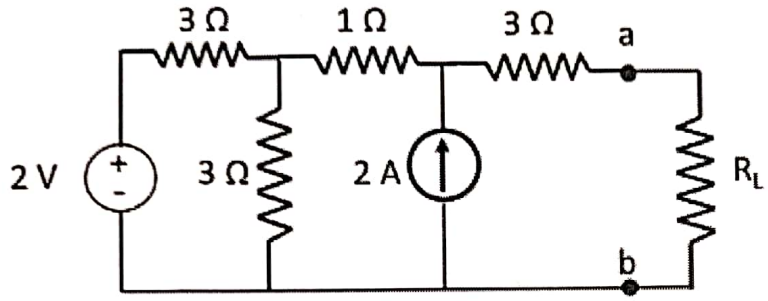
EE 101: Introduction to Electrical and Electronic Circuits, 2019

Quiz 1

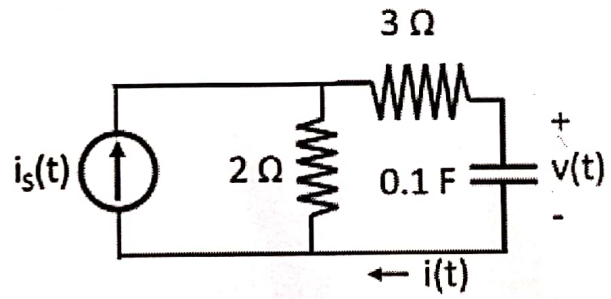
(Show all the steps in the solution properly. Weightage=6%)

1) Consider the circuit shown below.



Find the Thevenin equivalent of the circuit to the left terminals a and b. What is the maximum power that can be absorbed by the load R_L? [4 marks]

2) For the circuit shown below, suppose that $i_S(t)$=10 A for $t < 0$ and $i_S(t)$=0 for $t \geq 0$. Find i(t) and v(t) for all time and sketch these functions. [4 marks]



3) Consider an impedance operating at frequency, f=60 Hz. When a voltage given by: $v(t) = 10 \cos(2\pi f t + \pi/6)$ V was applied across the impedance, the current flowing through it was found to be given by $i(t) = 0.5 \sin(2\pi f t + \pi/3)$ A. Find out the power factor of the impedance. Find out the value of capacitance/inductance, which should be connected in parallel to the impedance, so as to get unity power factor. [4 marks]