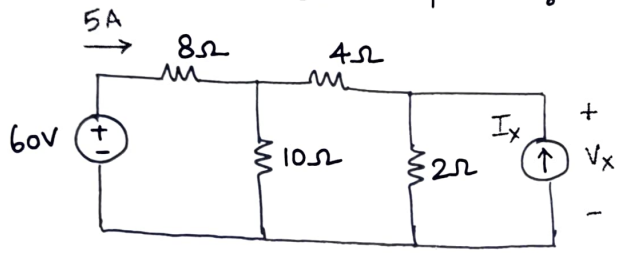
ECC-205 NETWORK THEORY

Tutorial - 2

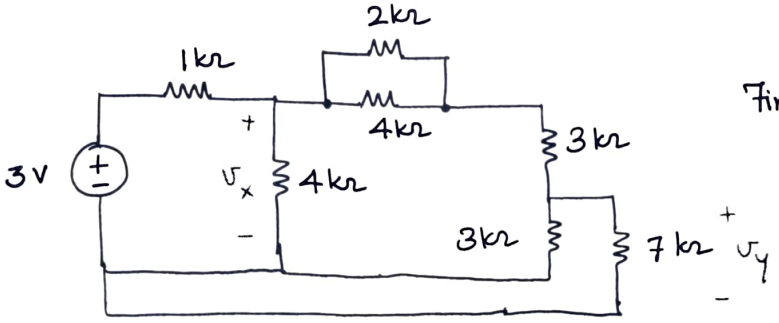
① A constant current of 3A for 4 hours is required to charge an automotive battery. If the terminal voltage is $10 + t/2$ (V) where 't' is in hours

(a) How much charge is transported as a result of the charging?

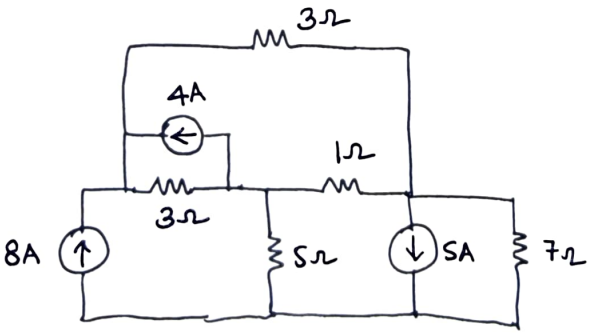
(b) How much energy is expended?

② 

Find V_x and I_x

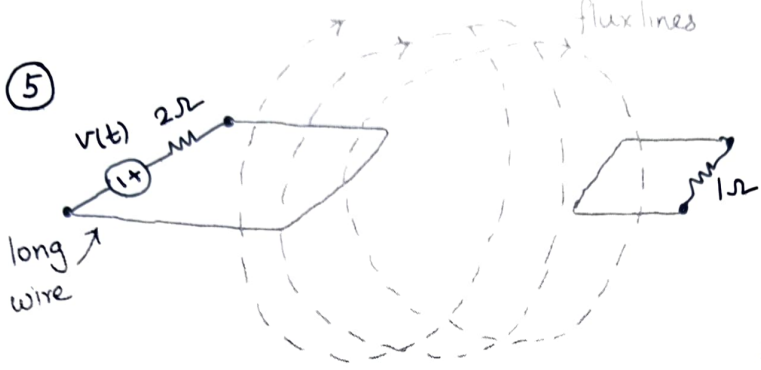
③ 

Find v_x and v_y

④ 

Calculate the power absorbed / dissipated by each of the element in the circuit.

(5)



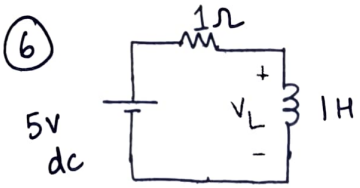
v(t) is a sinusoidal voltage source

$v(t) = 1\cos(\omega_0 t)$ (V)

The red lines indicate long non-ideal wires.

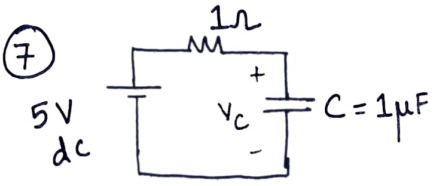
If 30% of the magnetic flux lines generated in the circuit on the left, passes through the loop on the right, calculate the power dissipated in the 1Ω resistor.

(6)



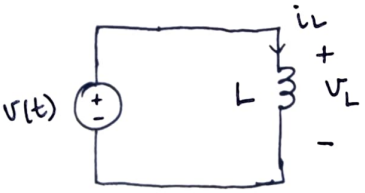
Calculate V_L.

(7)



Calculate V_c.

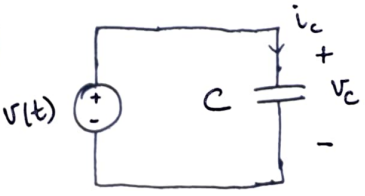
(8)



Assuming $i_L(0^-) = 0$,

Calculate the energy stored in the inductor at a time 't' in terms of the inductor current i_L.

(9)



Assuming $v_c(0^-) = 0$,

Calculate the energy stored in the capacitor at a time 't'.