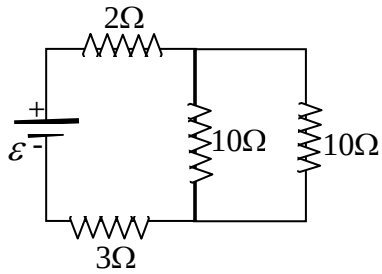
Name: No. Sec. ( )

PHYCS 102 Test 2 1/6/2004

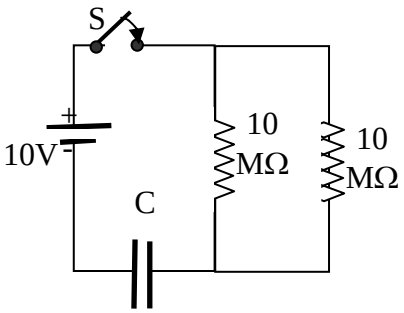
$e = 1.6\times10^{-19}$C, $m_e = 9.11\times10^{-31}$Kg, $m_p = 1.67\times10^{-27}$Kg

MCQ(/ 54)	Problem 1 (/ 30)	Problem 2 (/ 16)	Total (/100)
			Total (/15)



Q1- In the circuit shown, if ε =(10, 20, 30, 40) V then the power (in W) dissipated in the 2 Ω resistor is:

(A) 2 (B) 8 (C) 18 (D) 32



Q2- In the circuit shown S is closed at time t=0, if C= (2, 5, 8, 10) μF then the time (in s) it takes the capacitor to be charged by 64% of its final charge is:

(A) 10.2 (B) 25.5 (C) 40.8 (D) 51.1

Q3-A 10.0-m length of 0.5-mm-radius copper wire carries a current when (0.1, 0.2, 0.3, 0.4) V is applied to its ends. If the resistivity of copper is 1.6×10^{-8} Ω.m and the density of free electrons is 8.4×10^{28} m^{-3}, then the drift velocity (in **μm/s**) of the free electrons is:

(A) 46.5 (B) 93.0 (C) 139.5 (D) 186.0

Q4-A beam of protons enters a uniform (0.4, 0.3, 0.2, 0.1) -T magnetic field normal to the beam's velocity. The period (in **μs**) of rotation of a proton in its circular path is:

(A) 0.16 (B) 0.22 (C) 0.33 (D) 0.65

Q5-A light bulb has tungsten filament of a resistance of 20 Ω when cold at 20 ^oC. If the operating temperature of the filament is 1500 ^oC and its temperature coefficient of resistivity $\alpha = 0.0045\ ^oC^{-1}$, then the current (in A) passing in the filament when a voltage of (120, 150, 200, 240) V applied is:

(A) 0.78 (B) 0.98 (C) 1.3 (D) 1.56

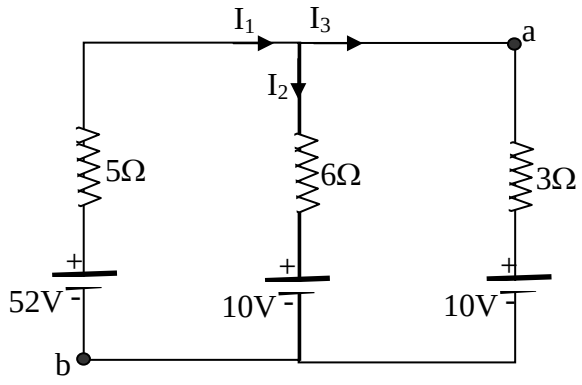
Q6-The figure shows a circular loop of wire of radius 0.5 m carries a (1, 2, 3, 4)-A current and lies in a 0.2-T magnetic field. The magnitude of magnetic torque (in N.m) on the loop is:

(A) 0.157 (B) 0.314 (C) 0.471 (D) 0.628

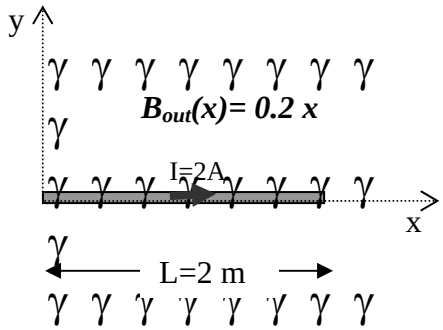
Problem 1: Consider the circuit diagram shown nearby and determine:

(a)- the currents I_1, I_2, and I_3.

(b)- the voltage difference between the two points a and b.



Problem 2: A conducting wire of length L=2 m is placed in a magnetic field that varies according to ***B(x)= 0.2 x*** (where *x* is in m and *B* is in T) directed out of the page as shown in the figure. If the current in the conductor is 2 A flowing along +x axis, then;



(a)-indicate the direction of the net magnetic force on the conductor.

(b)-calculate the magnitude of the net magnetic force on the conductor.