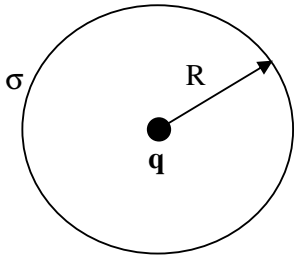
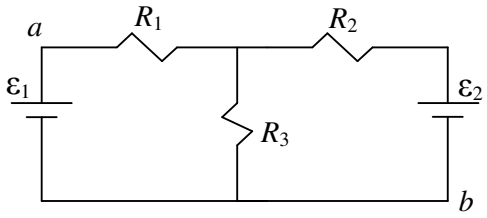
	UNIVERSITY OF GAZIANTEP **DEPARTMENT OF ENGINEERING PHYSICS** **EP 106 General Physics II** **Final Exam Questions**	**13/08/2004** **TIME 100 min.** **SUMMER SCHOOL**

Q-1) A spherical shell of radius R=2cm has a surface charge distribution of $\sigma = 2\text{x}10^{-4}$ C/m^2. If a point charge q=$2\text{x}10^{-6}$ C is placed at the center of the spherical shell, determine the electric field at ;
(a) r = 1cm and
(b) r = 4 cm from the center of the sphere

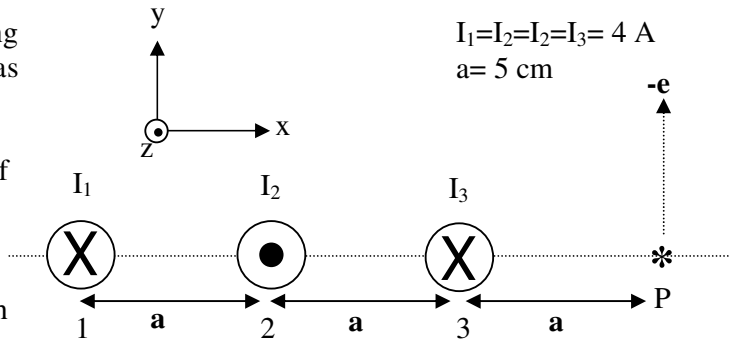


Q-2) In the given circuit
$R_1 = 1\ \Omega$, $R_2 = 2\ \Omega$, $R_3 = 3\ \Omega$, $\varepsilon_1 = 5$V and $\varepsilon_2 = 10$V
Determine ;
(a) the currents on each resistor
(b) the potential difference between *a* and *b* points.



Q-3) Three long parallel wires carrying current I_1, I_2 and I_3 are arranged as shown in Figure.

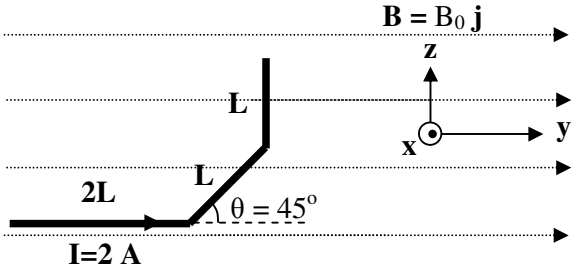
$I_1=I_2=I_2=I_3= 4$ A
a= 5 cm



(a) Find the magnitude and direction of the magnetic field at point P due to the three long-straigth wires

(b) if an electron is accelerated through the positive y axis with a speed of $2\text{x}10^6$ m/s and 5 cm from the right side of the third wire (P point), find the magnitude and direction of the force acting on it.

Q-4) A current carrying conductor, place in a uniform magnetic field $\mathbf{B} = B_0\,\mathbf{j}$, as seen in figure, carries a current I = 2 A. if $B_0 = 2$ Tesla, find the magnitude and direction of the total force acts on the conductor.



Useful constants:
e=$1.602\text{x}10^{-19}$ C $m_e=9.11\text{x}10^{-31}$ kg $\mu_0=4\pi\text{x}10^{-7}$ N/A $k=1/4\pi\varepsilon_0 = 9\text{x}10^9$ N.m^2/C^2