Université Abbes Laghrour de Khenchela
Faculté des Sciences et Technologie
Département de SM

Level: L1 (Math & informatique)
Final Exam : Phys 2
Date: 26/05/2025

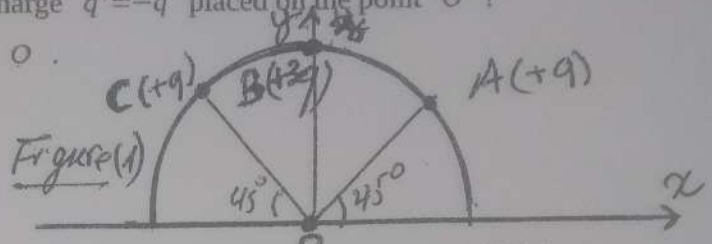
Exercise 1 (6 points)

Three point charges $q_A=+q$, $q_C=+q$ and $q_B=+3q$ are arranged, respectively, at the points A , B and C as shown in the figure 1.

1- Calculate and represent, on the figure1, the electric field of these three charges at the point O .

2- What is the electrostatic force applied to a charge $q'=-q$ placed on the point O ?

3- Calculate the electrostatic potential at point O .



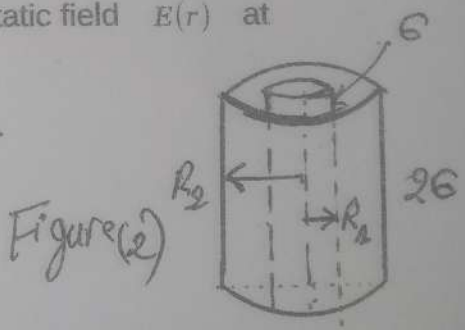
Figure(1)

Exercise 2(8 points)

Consider two coaxial cylinders of radii R_1 and R_2 such that $R_1<R_2$ and height h . The cylinder of radius R_1 carries a surface charge density $\sigma_1=\sigma>0$. Likewise the second cylinder of radius R_2 carries a surface charge density $\sigma_2=2\sigma>0$. (Figure 2)

1- Using the Gauss theorem, find the expression of the electrostatic field $E(r)$ at every point in space.

2- Deduce the expression of electric potential $V(r)$ for $r>R_2$.



Figure(2)

Exercise 3(6 points)

The generator in the figure3 has an electromotive force $e=9V$ and intererna resistance $r=0.5\Omega$.

1-Calculate the current intensity in each resistor.

2- What is the power provided by the generator?

3- What is the potential difference between A and C?

$R_1=R_2=R_4=1\Omega$, $R_3=2\Omega$, $R_5=6\Omega$

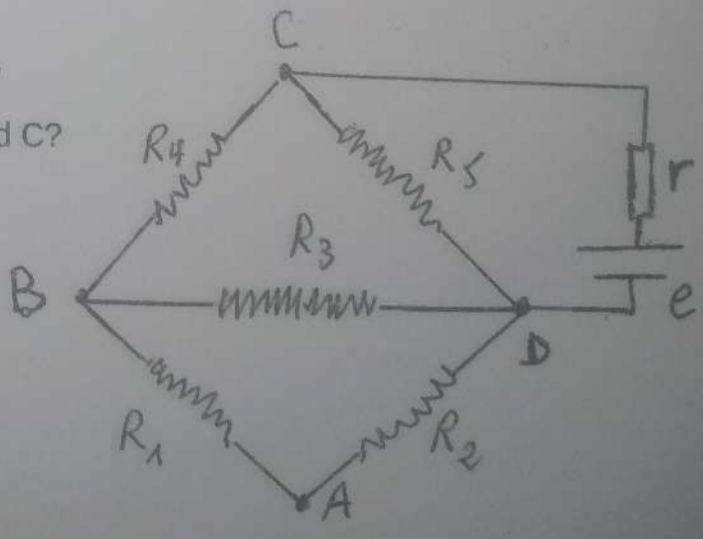


Figure (3)