**Ministry of Higher Education and Scientific Research**

**University Mohamed Boudiaf of M'sila**

**Faculty of Mathematics and Computer Science**

**Department of Computer Science**

**General Electricity**

**Problems & Exercises (of Chap 2)**

**Conductors in Electrostatic Equilibrium**

**Z. Elbahi (2025/2026)**

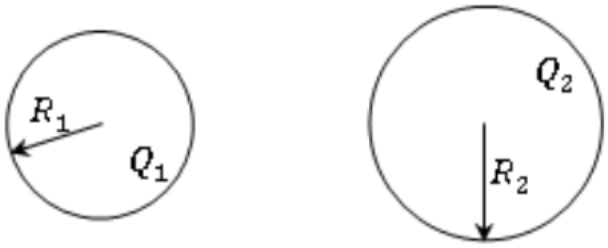
## Exercise 1

Two conducting spheres with radii $R1$ and $R2$, whose centers are at a very large distance compared to $R1$ and $R2$, and carrying charges $Q1$ and $Q2$.

1. Calculate the potentials $V1$ and $V2$ of the two spheres.

The two spheres are connected by a conducting wire with negligible resistance.

2. Calculate the charges $Q1'$ and $Q2'$, as well as the potentials $V1'$ and $V2'$.
3. Calculate the capacitance of the resulting single conductor.

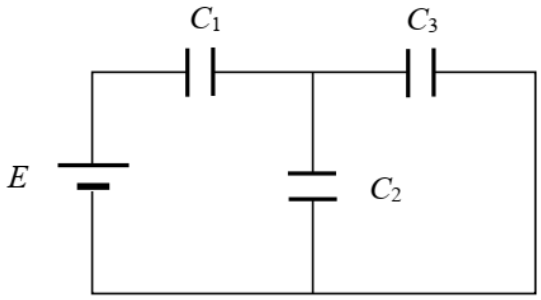



## Exercise 2

Consider three capacitors $C1 = C2 = 1\ \mu F$, and $C3 = 2\ \mu F$, initially uncharged, and connected as shown in the figure below:

1. Calculate the equivalent capacitance between the terminals of the generator.
2. Given $E = 4V$, determine the electric charge across each capacitor.

Hence, deduce the potential difference (PD) across each capacitor.




## Exercise 3

Consider six capacitors of capacitance $C_1 = 1.5\ \mu F$, $C_2 = C_3 = 3\ \mu F$, $C_4 = 2\ \mu F$, $C_5 = C_6 = 2.5\ \mu F$ and a dry cell of voltage $U_{PN}$ are connected to each other as shown in the adjacent **Figure 4**.

Given that: $V_{BD} = 5V$.

1) Calculate the equivalent capacitance $C_{eq}$ between **A** and **D**.

2) Calculate the charge $Q_{BD}$. Deduce the charge $Q_{eq}$ of $C_{eq}$. Deduce the voltage $U_{PN}$

3) Calculate the charge and the voltage across each capacitor.