Badji Mokhtar Annaba University **2025/2026**
Faculty of Technology
Computer Science Department **Module : *General Electricity***
1st year LMD

SERIES 2 (Part 1)

(Coulomb's Law, Electric Field and Electric Potential)

Exercise 1 :

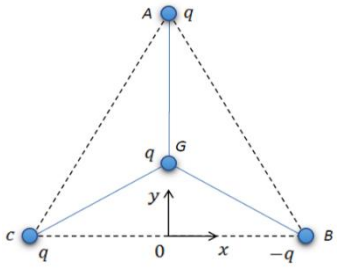
Let us consider two point charges q_1, $q_2 > 0$, placed at A (- a, 0) and B (a, 0) on an Ox axis.

1. Represent the force vector acting on the two charges.
2. Determine the repulsive force between the two charges.

Exercise 2 :

Calculate the force exerted by three charges placed at the vertices of an equilateral triangle of side $2a$, on a charge located at the center of this triangle.

We give: K = 9 10^9 (SI) ; q = 1 μC, - q = - 1 μC ; $2a$ = 1 cm



Exercise 3 :

Consider two charges q_1, q_2 placed in the same line at a fixed distance r.

1. Where can a third charge q_3 be placed to obtain electrostatic equilibrium?
- **Case 1** : $q_1 < q_2$ and both charges are positive.
- **Case 2** : $|q_1| < |q_2|$ with q_1 positive and q_2 negative.
2. Find this distance for : q_1 = + 2 nC , q_2 = + 18 nC and r = 25 cm.

Exercise 4 :

Consider four point charges q_A, q_B, q_c and q_D placed at the vertices of a square ABCD of side $2a$.

1. Find the electric field created by these charges at the point G (center of the square).
2. Deduce the force exerted by the other charges on the charge q_G placed at point G.
3. Determine the electric potential V at the point G and at the origin of coordinates.

We give : In an orthonormal coordinate system, the points A ($2a$, $2a$), B ($2a$, 0), C (0, 0) and D (0, $2a$).

$q_A = q_G = +q$; $q_B = q_C = q_D = -q$

q = 2 µC ; a = 10 cm