

Chapter 01

ELECTRIC CHARGES AND FIELDS

Example- 2:

What is the force between two small charged spheres having charges $2 \times 10^{-7} \text{ C}$ and $3 \times 10^{-7} \text{ C}$ placed 30 cm apart in air?

Solution:

Given,

$$q_1 = 2 \times 10^{-7} \text{ C}, \quad q_2 = 3 \times 10^{-7} \text{ C}$$

$$r = 30 \text{ cm} = 30 \times 10^{-2} \text{ m} = 3 \times 10^{-1} \text{ m}$$

$$\text{Force, } F = \frac{1}{4\pi\epsilon_0} \frac{q_1 q_2}{r^2}$$

$$F = \frac{9 \times 10^9 \times 2 \times 10^{-7} \times 3 \times 10^{-7}}{(3 \times 10^{-1})^2} = 6 \times 10^{-3} \text{ N}$$

$$F = 6 \times 10^{-3} \text{ N (repulsive).}$$