# Answer on Question # 73668, Physics - Electric Circuits :

**Question:** Calculate the ratio of the electrostatic force and the gravitational force exerted by two protons on each other.

**Solution:** We know mass of proton (m) = $1.6727 \times 10^{-27}$ kg.

Gravitational constant (G) = $6.67 \times 10^{-11}$ N $m^2/kg^2$.

Charge of proton (q) = $1.602 \times 10^{-19}$ C.

Now let distance between two protons is r.

So, electrostatic force between two protons, $F_E = k\frac{q^2}{r^2}$ .....(1)

Where k is constant with value $8.9 \times 10^9$ N-$m^2/C^2$

And gravitational force between two protons $F_G = G\frac{m^2}{r^2}$ .....(2)

So, $\frac{F_E}{F_G} = \frac{k.q^2}{G.m^2} = \frac{(8.9\times10^9)(1.602 \times 10^{-19})^2}{(6.67 \times10^{-11})(1.6727\times 10^{-27})^2} = 1.22 \times 10^{36}$ (approx).

**Answer:** Ratio of the electrostatic force to the gravitational force exerted by two protons on each other is $1.22 \times 10^{36}$.