

AFGJI

CLASS XII

PHYSICS ASSIGNMENT 5

1. State Coulomb's law and write its vector form.
2. Calculate no. of electrons that will form 1 coulomb charge. ($e^- = 1.6 \times 10^{-19} \text{C}$)
3. How will you charge a neutral body with a negative charge if you have a positively charged body? What is the name of the process? How many such bodies can be charged?
4. Calculate force between two protons of charge $1.6 \times 10^{-19} \text{C}$ separated by $5 \times 10^{-15} \text{m}$. (nucleus)
5. Calculate the ratio of coulomb to gravitational forces between an electron and a proton. $m_e = 9.1 \times 10^{-31} \text{kg}$,
 $m_p = 1.7 \times 10^{-27} \text{kg}$, $r = 5.3 \times 10^{-11} \text{m}$, $q_p = q_e = 1.6 \times 10^{-19} \text{C}$ (H-atom)
6. What is a dipole? What is the dipole moment if $q = 1.2 \mu\text{C}$ and distance between them = 2cm. What is its direction?
If this dipole is replaced by an ideal dipole what will be its dipole moment?
7. Calculate the electric field due to a dipole at a distance r on its equator? State the condition for which this expression is valid?
8. State Gauss's Law. Using this find an expression for electric field due to a plane sheet of charge.
9. Using Gauss's law find an expression for field (i) inside a hollow charged spherical conductor, (ii) outside the charged conductor. Draw a graph showing variation of E with distance. (radius of the hollow conductor is R)

Submit the assignment by 15.4 2014