

Neutron classes

(Managed by IITians, NITians)

1. Which one is bigger, a coulomb or charge on an electron? How many electronic charges form one coulomb of charge?
2. How much positive and negative charge is there in a cup of water?
3. If a body gives out 10^9 electrons per second, how much time is required to get a total charge of 1 C from it?
4. The electrostatic force of repulsion between two positively charged ions carrying equal charge is 3.7×10^{-9} N, when they are separated by a distance of 5 Angstrom. How many electrons are missing from each ion?
5. A charge q is placed at the centre of the line joining two equal charges Q . Show that the system of three charges will be in equilibrium if $q = -Q/4$.
6. Consider three charges q , q and $-q$ placed at the vertices of an equilateral triangle of each side l . What is the force on each charge?
7. Two fixed point charges $+4e$ and $+e$ units are separated by a distance a . Where should the third point charge be placed for it to be in equilibrium?
8. A copper sphere of mass 2 g contains nearly 2×10^{22} atoms. The charge on the nucleus of each atom is $29e$. What fraction of the electrons must be removed from the sphere to give it a charge of + 2 micro-coulomb?
9. Two point charges of + 2 micro-coulomb and +6 micro-coulomb repel with each other with a force of 12 N. If each is given an additional charge of – 4 micro-coulomb, what will be the new force?
10. Three equal charges 2.0×10^{-6} C each, are held fixed at the three corners of an equilateral triangle of side 5 cm. Find the coulomb force experienced by one of the charges due to the other two charges.
11. Two equally charged particles, held 3.2×10^{-3} m apart, are released from rest. The initial acceleration of the first particle is observed to be 7.0 m/s^2 and that of the second to be 9.0 m/s^2 . If the mass of the first particle is 6.3×10^{-7} kg, what are (a) the mass of the second particle and (b) the magnitude of the charge of each particle?